PROPOSAL

FOR

TAS 26-28A D215118

REHABILTATION OF THE WASTEWATER TREATMENT PLANT
AT THE PORT BYRON SERVICE AREA
ON I-90, MILEPOST 310.0 EB

BOOK 1 OF 1

THIS BOOK CONTAINS SPECIFICATIONS AND
BID PROPOSAL WORKSHEETS

SUBMITTED IN ACCORDANCE WITH THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS OFFICIALLY ADOPTED SEPTEMBER 1, 2026 EXCEPT AS MODIFIED IN THE PLANS AND/OR PROPOSAL AND ANY CHANGES WITH ARTICLE 2, TITLE 9 OF THE PUBLIC AUTHORITIES LAW.

LETTING OF

OCTOBER 21, 2026

BIDS DUE: 10:30 A.M.
BIDS OPEN: 11:00 A.M.

NEW YORK STATE | Thruway Authority
200 Southern Blvd., Albany, NY 12209

NOTICE
TO
BIDDERS

In addition to the bid deposit requirement, this Proposal shall be accompanied by a Statement of Surety's Consent on the form furnished by the Authority. (See last page).

BIDDERS ARE SUBJECT TO LOSS OF BID DEPOSIT FOR FAILURE TO OBTAIN PROPER BONDING.

Thruway Authority
Designated Contacts

Pursuant to NYS Finance Law Sections 139-j and 139-k, the following people are the designated contacts for this procurement process:

For all technical or engineering related questions:

- Alfred Yalaju, RA
  Project Designer
  Alfred.Yalaju@thruway.ny.gov

Or

- Dan Livermore, PE
  Director, Structures Design Bureau
  Dan.Livermore@thruway.ny.gov

Or

- Albert Mastroianni, PE
  Director, Office of Design
  Albert.Mastroianni@thruway.ny.gov

For all procurement contract process related questions:

- Kelly Galvin
  Office of Procurement Services
  Kelly.Galvin@thruway.ny.gov

Or

Jonathan Hill
Deputy Director of Capital and Contracts Management
Office of Procurement Services
Jonathan.Hill@thruway.ny.gov

For more information about NYS Finance Law Sections 139-j and 139-k, please see the New York State Thruway Authority Guidelines for Lobbying included in this Proposal.

NEW YORK STATE
THRUWAY AUTHORITY

NOTICE TO BIDDERS

The Thruway Authority conducts public bid openings. Visitors who choose to hand deliver a bid and/or witness the bid opening are limited to one person. The Thruway Authority also uses YouTube to broadcast its live bid openings. The link to live streams are available from the Thruway website here: https://www.thruway.ny.gov/news/meetings/bid-openings.html
or directly from YouTube at:
https://www.youtube.com/@nysthruwayauthority6263/streams

Sealed bids must be hand delivered, or delivered by first class mail, USPS Express or Priority Mail, or overnight delivery service (e.g., FedEx, UPS) to the New York State Thruway Authority Headquarters Building, at the following address only: New York State Thruway Authority, 200 Southern Boulevard Albany, NY 12209.

Sealed bids should not be sent or delivered to any other address or location, and the Authority is not responsible for any late deliveries or misdirected bids.

Regardless of the delivery method selected, all sealed bids, whether paper or electronic form, must be delivered by 10:30 A.M, on Wednesday, October 21, 2026, where they will be opened publicly and read aloud at 11:00 A.M. Any bids sent or delivered to an address or location other than the one specified above, or received after this time, will not be accepted.

Contract TAS 26-28A / D215118 Rehabilitation of the Wastewater Treatment Plant at the Port Byron Service Area on I-90, Milepost 310.0 EB in Cayuga County in accordance with the Plans and Specifications.

Your bid must be secured with either a Bid Bond or a Bid Deposit. A Bid Bond must be in the amount of 5% of the total bid and must be on the Authority's Bid Bond Form (TA-44117) which is included in the Proposal. A Bid Deposit must be a certified check or cashier's check made payable to the New York State Thruway Authority in the amount of **$200,000.00.**

Plans, proposals, and information on how to download Contract Bid Data are available on the Authority's Website at www.thruway.ny.gov.

SPECIAL NOTE

The New York State Thruway Authority has discontinued the practice of reproducing and furnishing full-size and half-size plans to Contractors after contract award. Contractors shall be responsible for their own hard copies of plans and proposals at no additional cost to the Authority.

New York State Can Help You Secure Surety Bonding

The NYS Surety Bond Assistance Program (NYSBAP) provides technical and financial assistance to help contractors secure surety bonding. Contractors may be eligible to receive a guarantee of up to 30% to secure a surety bond line, bid bond or a performance and payment bond on State projects. Training is also available to contractors requiring technical support on how to become bond-ready. For more information and to fill out a NYSBAP application, visit https://esd.ny.gov/new-york-state-surety-bond-assistance-program or contact Ms. Huey-Min Chuang at Empire State Development at 212-803-3238 or BAP@esd.ny.gov.

02/2026

SPECIAL NOTE
REQUEST FOR INFORMATION (RFI)

A **request for information (RFI)** is a written process used to clarify a detail, specification, or note in the contract documents, provide notification of a possible error or omission, or request a minor modification due to possible unforeseen issues that may occur during construction.

However, during the period between project advertisement and award of contract, the prospective Bidder/Contractor shall submit all RFIs to the appropriate "Designated Contact" via e-mail, as listed elsewhere in the Proposal. The prospective Bidder's/Contractor's RFI shall be forwarded to the designated contact. The Bidder Request for Information, Thruway Authority form TA-W44137, can now be found on the Authority's website at:
http://www.thruway.ny.gov/business/contractors/documents/ta-w44137.pdf

This form should be filled out as completely and accurately as possible, numbered sequentially, as may be necessary, and saved in pdf format. Any supporting information that may help describe the issue more clearly, as well as any suggestions or recommendations for possible resolution, should also be provided. The form once complete shall be forwarded to the designated contact as instructed in the form.

Responses by the Authority to RFI's will be documented as Questions and Answers and posted for all bidders' reference, under each respective project, on the Thruway Authority's website at:
http://www.thruway.ny.gov/business/contractors/documents/index.shtml

Questions and Answers posted to the Authorities internet page may not be memorialized as amendments. Thus, prospective bidders are advised to check the Thruway Authority's website regularly before letting (or proposals are due), for Questions and Answers updates. Please be advised that RFI's submitted the week of the letting may not be answered.

Any changes to the Contract documents that result from an RFI will be addressed via an amendment.

New York State Thruway Authority

Contract No. TAS 26-28A

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PROJECT INFORMATION

TAS 26-28A
D215118

NEW YORK STATE THRUWAY AUTHORITY

DEPARTMENT OF ENGINEERING

PROPOSAL ESTIMATE FOR

REHABILITATION OF THE WASTEWATER TREATMENT PLANT

AT THE PORT BYRON SERVICE AREA ON I-90

AT

MILEPOST 310.0 EASTBOUND

IN THE

SYRACUSE DIVISION

OF THE

NEW YORK STATE THRUWAY

IN

CAYUGA COUNTY

TYPE	LIMITS
Rehabilitation of Wastewater Treatment Plant Facility	**Port Byron Service Area I-90, Milepost 310.0 Eastbound Plus Advance Signing**

DEPOSIT REQUIRED **$200,000.00**

COMPLETION DATE **December 31, 2027**

PRE-AWARD NOTICE

A Pre-Award Meeting has not been scheduled for this project. If a Pre-Award Meeting is deemed necessary, notice of the date and time will be provided.

To assist the Authority in its award process, the successful low bidder must furnish the following items upon request:

1. A current New York State Uniform Contracting Questionnaire (NYSUCQ) CCA-2 form must be on file;

2. A list of current contracts giving the firm or agency for which they are being performed, the name and phone number of someone therein familiar with the contractor's work, the contract amount, and percent of completion;

3. Pre-Award Project Schedule;

4. Documentation of the actions taken to comply with the Minority/Women's Business Enterprise Utilization goals (Non-Federal), or Disadvantaged Business Enterprise goals (Federal) as defined in the Proposal;

5. A "Schedule of Participation of Minority/Women's Business Enterprise" (Form TA-1022), or Disadvantaged Business Enterprise" (Form TA-1022F);

6. AAPHC-89 Approval to Subcontract.

Contract Documents will be supplied with the Authority's notice to the successful low bidder and must be executed and returned to the Authority within ten (10) days of receipt.

If a Pre-Award Meeting is held, it is requested that the Project Superintendent be present. The Contractor should be prepared to provide, upon request by the Authority, information regarding, among other things, the following:

1. Use of subcontractors, including who they will be and what items of work they will perform;

2. Suppliers and manufacturers;

3. Traffic control and safety;

4. Any anticipated problems that could affect the progression of the project.

CONTRACT AWARD

The award process cannot begin until the executed Contract Documents have been returned to the Authority and the successful Low Bidder has provided acceptable documentation with regard to his actions taken to comply with the M/WBE goals of this Contract or DBE Goals for Federally Aided Contracts.

ALL BIDDERS

PRE-BID INSPECTION

The prospective bidder must have in its possession the Contract Plans/Proposal and a Work Permit for identification purposes when conducting a pre-bid inspection of the Thruway facility.

The prospective bidder shall inform the appropriate Division Point of Contact (listed below) prior to visiting the site and shall strictly comply with all instructions and requirements.

- **The New York State Thruway Authority Permit Application (TA-W5124)** and information on required insurance documentation is available at https://www.thruway.ny.gov/business/forms-guidelines#occupancy-%26-work-permits. The application along with insurance documentation shall be submitted to the appropriate Thruway Authority Division Permit Coordinator as indicated on page 2 of the application. The fee is waived for this Pre-Bid Inspection.

Division	Point of Contact	Phone
New York	Timothy Mathew	(845) 918-2510
Albany	Michael Beaudet	(518) 471-5940
Syracuse	Trevor Thieme	(315) 438-2384
Buffalo	Nicholas Przybylski	(716) 635-6253

Provisions of Section 107-05, Equipment Safety Procedures, contained in the Contract Proposal shall apply to all Pre-Bid Inspectors and shall be strictly adhered to while performing the pre-bid inspection.

PRECONSTRUCTION MEETING

A Pre-Construction Meeting will be held prior to the start of construction. The time, date and location will be coordinated by the Division Construction Engineer who will provide this information to the successful low bidder as soon as it is available.

WITHDRAWAL OF BID

A Contractor may at any time, upon at least fifteen (15) days written notice, withdraw its bid on a date sixty (60) days after bid opening or thirty (30) days after the properly executed contract documents have all been received by the Authority, whichever is later. The bid bond, bid deposit, and/or performance bond shall remain in effect until such period of written notice has expired provided the contract has not been approved by the Office of the State Comptroller in the interim.

The Contractor and the Authority may agree in writing to extend the date upon which the bid may be withdrawn if the contract has not been approved by the Office of the State Comptroller.

WORK TO BE DONE

The following is a general description of the work to be done under this Contract. This list is intended to give the Contractor a general description of the work involved in this Contract and is not a complete listing of all work to be done. All work shall be done in accordance with the Contract Documents even though not specifically mentioned in this list.

1. Provide basic work zone traffic control according to the contract documents and as ordered by the Engineer.

2. Perform the work as identified in the plans and special specifications.

3. Restore disturbed areas and clean-up as directed by the Engineer.

SCHEDULE AND SUSPENSION OF WORK

The New York State Thruway is a limited access, high-speed, high-volume highway. Traffic shall be maintained in accordance with the *Manual on Uniform Traffic Control Devices (MUTCD),* the *Work Zone Traffic Control Plans*, the *Standard Specifications* Section 619 and the following provisions:

A. WORK ZONE TRAFFIC CONTROL

1. Lane closures on the Thruway shall only be allowed in accordance with the traffic management table(s), available on the Thruway Authority website at http://www.thruway.ny.gov/business/contractors/standard-sheets/index.shtml, unless indicated otherwise in the contract documents. If more than one table is applicable to a work zone location, the most restrictive requirements shall be used. Traffic management tables do not guarantee lane closure availability; the requirements of Section B. *Work Restrictions* shall supersede these tables, when applicable.

2. Lane closures on the Thruway will be permitted for work site access, delivery of materials and equipment, and work operations. Personal vehicles will **NOT** be allowed to park along the Thruway or within lane closures on the Thruway at any time. During non-working hours, all equipment and materials shall be stored at least 30 feet from the edge of pavement (both mainline and ramps) or be protected by a physical barrier approved by the Engineer.

3. Lane closures will **NOT** be permitted during holiday periods or when unforeseen circumstances arise, as described in Section B. *Work Restrictions,* unless indicated otherwise in the contract documents.

4. Lane closures will **NOT** be permitted for the sole convenience of the Contractor. Lane closures will be permitted in order to protect traffic from an actual hazard, as determined by the Engineer.

5. Permanent lane closures will **NOT** be permitted for the duration of the contract.

6. Simultaneous closure of right and left shoulders will **NOT** be permitted unless indicated otherwise in the contract documents. Either right or left shoulder must remain clear and available through all work zones. The open shoulder shall not be used for the storage of vehicles, equipment, supplies or any other obstructions, or for any work activity.

7. Ramp closures will **NOT** be permitted, unless indicated otherwise in the contract documents. Access to interchanges, service areas and parking areas shall be maintained at all times.

8. Traffic will **NOT** be permitted to drive on milled pavement, unless indicated otherwise in the contract documents.

B. WORK RESTRICTIONS

1. **HOLIDAY PERIODS.** Lane closures will **NOT** be permitted during holiday periods, unless indicated otherwise in the contract documents. The Authority may permit work on Thruway facilities only if operations do not inhibit or distract traffic. Access to work sites from state and local roads will be permitted provided the municipality having jurisdiction for the road gives written permission. Holiday periods for this project shall be as follows:

SCHEDULE AND SUSPENSION OF WORK

SYRACUSE DIVISION

2026						
HOLIDAY	FROM			TO		
	TIME	DAY	DATE	TIME	DAY	DATE
Thanksgiving	Noon	Tuesday	11/24/2026	Noon	Monday	11/30/2026
Christmas/New Year's Day	Noon	Thursday	12/24/2026	6:00 a.m.	Monday	01/04/2027

2027						
HOLIDAY	FROM			TO		
	TIME	DAY	DATE	TIME	DAY	DATE
Dr. Martin Luther King, Jr. Day	Noon	Friday	01/15/27	8:00PM	Monday	01/18/27
Presidents' Day	Noon	Friday	02/12/27	8:00PM	Monday	02/15/27
Easter	Noon	Thursday	03/25/27	8:00PM	Monday	03/29/27
Memorial Day	Noon	Thursday	05/27/27	Noon	Tuesday	06/01/27
Juneteenth	Noon	Thursday	06/17/27	Noon	Monday	06/21/27
Canada Day/Independence Day	Noon	Wednesday	06/30/27	Noon	Tuesday	07/06/27
State Fair/Labor Day	6:00AM	Wednesday	08/25/27	Noon	Tuesday	09/07/27
Columbus Day/ Thanksgiving (Canada)	6:00AM	Friday	10/08/27	Noon	Tuesday	10/12/27
Thanksgiving	Noon	Tuesday	11/23/27	Noon	Monday	11/29/27
Christmas/New Year's Day	Noon	Thursday	12/23/27	6:00AM	Monday	01/03/28

2. Proposed lane closure schedules shall be submitted to the Engineer for review and approval at least one week in advance of the earliest closure.

3. The Contractor shall **NOT** be allowed to establish any lane closures during periods of inclement weather, wet or icy pavement, reduced visibility, traffic accident, emergency, or if the lane closure is causing excessive delay to the public. The Authority reserves the right to alter any lane closure and/or direct the Contractor to immediately remove a lane closure during such circumstances. The Authority shall be the sole judge of when conditions warrant these lane closure restrictions, and such restrictions will not entitle the Contractor to file a claim for additional compensation.

4. **SYRACUSE STATE FAIR 2027:** Lane closures will **NOT** be permitted from 7:30 a.m. Wednesday, August 25, 2027, through 6:30 a.m. Tuesday, September 7, 2027.

5. **WINTER SHUTDOWN.** A winter shutdown shall be in effect from 3:00 p.m. **November 15** to 6:00 a.m. **April 1**. During this period, the Contractor shall **NOT** be permitted to have lane closures. All temporary tape lines shall be removed, temporary concrete barrier shall be set in its winter shutdown location, and all traffic shall be re-established to its pre-construction configuration on permanent alignment. Mobilization for the following construction season may begin prior to **April 1** with permission from the Authority.

6. The Contractor shall submit a Plan of Operations to the Engineer prior to working on any full-depth repair area shown in the contract documents. The Plan of Operations shall list all full-depth repair areas and the estimated duration to complete each location. The Contractor shall also identify any full-depth repair area that may not be completed within the timeframes allowed by the traffic management table(s). For such

location(s), the Contractor may request a waiver of restrictions to complete the repair(s). The Authority will review the request and determine whether or not a waiver will be granted. The Authority has the right to divide repair areas into smaller sections in lieu of granting a waiver.

7. The Contractor shall have 45 calendar days to replace the Milled in Audible Roadway Delineators (MIARDs; Formerly referred to as Shoulder Treatment for Accident Reduction (STAR) groove pattern) where more than 1,500 contiguous feet have been removed by other contract work. The Contractor shall also ensure that MIARDs are installed prior to the official shutdown period, regardless of the 45 calendar day requirement or the length removed. Exceptions to this requirement are shoulders protected by temporary traffic control devices installed as part of a work zone traffic control plan developed in the contract documents or areas directly adjacent to detour pavement that will be used in subsequent phase(s) of the project.

   The Contractor shall consider these requirements when preparing bids and scheduling/sequencing the work for this contract. Failure to comply with the time frames specified will be considered a substantial deficiency in work zone traffic control and result in the non-payment for the Basic Work Zone Traffic Control Item for each calendar day during which MIARDs (formerly referred to as STARs) remain incomplete. Liquidated Damages will also be assessed at rates shown in Table 108-1 of the NYSDOT Standard Specifications.

8. Work restrictions may be modified if:

   a. The Contractor has received permission through the Engineer, from the Division Director or designee, to progress construction operations contained entirely behind temporary concrete barrier. There shall be no hauling of materials in or out of the work site during restricted periods, and open lane availability requirements shall not be violated or compromised.

   b. The Contractor has received permission through the Engineer, from the Division Director or designee, for temporary modification of the lane availability restrictions for performance of specific construction operations for a specific time period.

      NOTE: Such requests must be based on current traffic volumes which would permit the requested temporary modification with little probability of causing disruption or delay to the public.

      The Contractor shall include full explanation of the benefits to the Public and to the Authority, which would accrue in granting a temporary waiver for performance of the specific operations including calculations for any credit that may be offered. A contingency plan for action to be taken, should an unexpected traffic backup occur, shall accompany this presentation and will be one prime consideration in evaluating the request.

   c. The Contractor has received written authorization from the Division Director or designee to perform specific construction operations, violating the lane availability restrictions or other work restrictions during a specifically prohibited time period.

      NOTE: The Contractor shall submit a written request to the Authority's Division Director, with copy to the Engineer, for permission to perform specific construction operations at specific locations and times, including a detailed explanation of why the work cannot be performed in conformance with the contract. Such requests must be received at the Division Office at least one full week before the date of the requested variance, and at least two full weeks should granting the waiver require making notice to the public regarding potential disruptions and delays.

If written authorization to work is granted by the Authority, the Contractor shall be strictly limited to those operations approved in the authorization. In making application for a waiver, the Contractor agrees

that any waiver of restrictions granted by the Authority is exclusively for the Authority's benefit and purposes, and as such is subject to revocation without requirement for advance notice. Also, the disapproval of requests for waiver of contract requirements is not subject to administrative review or appeal under the contract.

C. GENERAL CONDITIONS

The Contract is to be completed on or before the specified completion date. If, for any reason, the Contractor fails to fulfill this obligation and requests an extension of time and the request is granted, the Authority, as a condition for extending the time of completion, shall retain the right to limit the Contractor's hours and/or days of work and/or impose conditions under which the work shall be performed in order that the traffic may not be unduly inconvenienced.

All the required liability and property damage insurance with the limits stated in this Proposal shall be effective and shall be continued in force throughout the life of this Contract including the stated periods of the suspension of the work.

The Contractor shall consider the foregoing requirement when preparing its "Schedule of Operations".

ADDITIONAL INSURED PARTIES

The following is a list of additional insured parties:

Adesta, an Allied Universal Company
Town of Montezuma

NON-REVENUE CONTRACTOR TRAVEL

NYS Thruway has converted to Cashless Tolling, Non-revenue pass plates will no longer be furnished to the Contractor.

Contractors and Consultants must have a properly mounted E-Z Pass transponder and must submit their EZ-Pass information to the Thruway to avoid charges for contract related business on the Thruway. The Project Engineer will provide the form used to record and submit EZ Pass information. Initial information shall be submitted to the Project Engineer prior to the start of work on the project. The initial form and any changes shall be submitted 5 working days prior to intended travel.

Non-revenue travel will be provided within the limits of Interchange **40** and Interchange **41**. Travel originating or ending outside of these limits will be subject to toll charges for the entire trip.

The Contractor shall be responsible for any and all tolls charged to contractor owned vehicles with (or without) E-ZPass Transponders not registered with the Authority.

OTHER CONTRACTS

The Contractor will be required to coordinate work with other contractors and NYSTA maintenance forces. The following contracts have been let and may have work in progress during the duration of this contract:

CONTRACT NO.	DESCRIPTION	COMPLETION DATE
TAS 26-10A / D215078	Replace Waterline at the Port Byron Service Area, MP 310.2 EB	April 6. 2027
TAA 26-25 / D215112	Albany & Syracuse Divisions Replacement of TDS Equipment at various locations	November 20, 2027
TAB 26-24 / D215111	Syracuse and Buffalo Divisions Replacement of TDS Equipment at various locations	November 20, 2027
TAS 25-26 / D215050	Syracuse Division On Demand Repairs to Thruway Infrastructure	December 31, 2027

The following contracts are anticipated to be let and may have work in progress during the duration of this contract:

	DESCRIPTION	
TAS 26-34 / D215128	Syracuse Division: Pavement Safety Striping – 2027	August 27, 2027
TAS 26-27B / D215117	Replacement of the Auburn Street Route 90 over Thruway at MP 312.16 and Replacement of Thruway over Crane Brook at MP 310.98	November 15, 2028

ENGINEER'S OFFICE AND CONTRACTOR'S FIELD OFFICE AND STAGING AREA

The location of the Engineer's Office and Contractor's Field Office shall be determined during the Pre-Construction Meeting. The site shall be approved by the Engineer prior to placing the offices and the area shall be kept in a neat, clean condition at all times. The area shall not be used as a staging, storage, equipment or employee parking area.

U-TURNS/CROSSOVERS

The Contractor may be permitted to use official median openings for U-turns and crossovers with written authorization from Division Traffic Supervision. Official median openings are available as shown elsewhere in the proposal.

U-turns and crossovers shall not be permitted at toll plazas or on interchange ramps. In addition, tractor trailer combinations are prohibited from U-turns at any location on the Thruway system. These vehicles must exit the Thruway system and re-enter for all direction changes. U-turns may be permitted within a maintenance facility, however, with prior approval from both Division Traffic Supervision and the Thruway Maintenance Supervisor 2 for that facility. All applicable traffic laws must be followed.

SPOIL AREA

There is no identified spoil area within the Thruway Authority's right-of-way for this contract. Therefore, the Contractor shall remove all surplus material and waste from Thruway Authority (Authority) property. The Contractor shall bid accordingly for this condition.

The Contractor shall provide the Authority a copy of all easements and/or access agreement letters received from landowner(s) of off-site disposal area(s) prior to disposal of any material. The easements and/or access agreement letters must include a statement by the Contractor and the landowner that the disposal of the material is in compliance with all applicable federal, state and local laws and regulations.

Should a mutually approved spoil use area within the Authority's right-of-way be identified for Contractor use after the project letting, a credit in the amount of 50% of the unclassified excavation unit bid price will be deducted for each cubic yard spoiled within the Authority right-of-way. If the contract does not contain an unclassified excavation item, the credit will be determined using either 50% of the item generating the spoil or 50% of the Division/Regional weighted average bid price for unclassified excavation, whichever is less. This credit may be waived, either wholly or in part, by the Division Director in writing if it is determined that permitting spoil on Authority right-of-way is in the best interest of the Authority (ie: slope flattening resulting in elimination of guide rail).

ADESTA, AN ALLIED UNIVERSAL COMPANY INDEMNIFICATION

This project requires the Contractor to do work that may impact the Thruway Authority's fiber optic system.

The fiber optic system, comprised of features inclusive of telecommunications cables, lines, fibers, conduits, access manholes, pedestals, boxes and other fiber optic system components and devices, is operated and maintained by ADESTA, an Allied Universal Company.

The Contractor shall indemnify and hold harmless ADESTA, its officers, agents, employees and contractors from and against any and all injuries, claims, demands, judgments, liabilities or damages resulting from, or related to, the Contractor's negligence, gross negligence and/or willful misconduct in the performance of the work. The Contractor shall also indemnify and hold harmless ADESTA from claims by third parties having an agreement with ADESTA to use the fiber optic system. The Contractor shall include ADESTA as an additional insured party under the insurance requirements of this contract.

SHOULDER MAINTENANCE

During the course of the project, the Contractor may be required to repair shoulders that have deteriorated. The Contractor shall remove the deteriorated shoulder surface and place new asphalt shoulders. The Contractor shall be paid using the appropriate contract items for excavation and asphalt. The exact limits for this work shall be as directed by the Engineer.

OVERHEAD GANTRY

SIGNING

Signs shall be installed within the project limits when any component of equipment will be operating above 14'-6" in elevation and within 100 linear feet of an overhead gantry. Overhead gantries may have electric powered wires and special equipment, therefore, vehicle and equipment operations must be planned and proposed equipment safety procedures included in a Project Safety and Health Plan.

As mentioned in the Thruway Addendum to the Standard Specifications (TA), specifically in **Section 107-05 SAFETY AND HEALTH REQUIREMENTS**, ***O. Equipment Safety Procedures. 6. Work Operations.*** **d.** Dump truck boxes may be raised only under the control of a spotter, unless the vehicle is in an area clearly marked to be free of overhead wires and safe for dumping.

Refer to Thruway Standard Sheet **TA 619-27** for additional information and signing requirements.

OVERHEAD GANTRY

TRAFFIC SHIFT RESTRICTIONS

The Contractor shall not shift traffic at any toll gantry such that vehicles are traveling between lanes or between lanes/shoulders when passing under the gantry centerline (treadle). Traffic shifts, for purposes of staging work, shall be done prior to or after the gantries, such that vehicles are traveling within a complete lane or shoulder when passing under the gantry centerline (treadle). All work zone traffic control shall be provided in accordance with the 619 Standard Specifications and the Thruway Addendum to the 619 Standard Specifications, the National Manual on Uniform Traffic Control Devices and NYS Supplement, any provisions contained within the contract documents, and as ordered by the Engineer.

OVERHEAD GANTRY

PARKING RESTRICTIONS

The Contractor shall not park any vehicle or construction equipment directly beneath overhead gantries, within a complete lane or between a lane/shoulder, unless it is required to perform project specific related work, as directed by the Engineer in Charge and after coordination with the Authority's Intelligent Transportation System Management unit.

SPECIAL NOTE

AUTOMATED WORK ZONE SPEED ENFORCEMENT (AWZSE)

The Contractor is hereby notified that the Authority *may* elect to deploy automated speed enforcement units at certain times during the project. Project locations that qualify for the deployment of an automated speed unit must meet the following criteria:

- Limited Access Highways only
- Workers must be present

The unit will be deployed and operated by a private vendor under the direction of the Authority, the Thruway Project Engineer, or designee. The automated unit may consist of a trailer mounted unit, a free-standing unit, or contained within a work vehicle. The AWZSE vendor will provide, and is responsible for, the setup and taken down of all speed enforcement equipment and required signage. The Contractor shall be responsible for the setup and maintenance of all other signage and work zone traffic control devices required by the appropriate standard sheet.

The Contractor shall coordinate with the Thruway Project Engineer, or designee, and the speed enforcement vendor to find a safe location for the unit within the work zone that does not interfere with on-going work.

Syracuse Division Crossovers

Revised 02/21/22

Milepost	Use Code	Milepost	Use Code	Milepost	Use Code
197.37	2	255.60	2	308.11	2
197.70	2	257.225	2	309.36	2
200.08	2	259.075	2	310.97	2
202.53	2	261.125	2	312.35	2
205.24	2	262.60	2	313.32	2
208.13	2	263.885	2	314.65	5
209.49	2	266.05	2	316.59	2
210.38	2	266.71	2	317.59	2
211.41	2	268.90	2	319.95	2
212.73	2, 6	270.85	2	320.85	2
214.66	2	272.81	2	323.37	2
216.53	2	275.50	2	324.75	2
218.77	2	276.18	2	326.23	2
220.30	2	277.27	2	327.51	2
223.18	2	278.435	2	330.15	2
		279.80	3, 2	332.09	4
226.62	2	282.50	3, 2	334.45	2
227.48	2	284.13	3, 2	336.77	2
229.21	5	285.45	4	337.41	2
231.13	2	288.60	2	339.61	2
237.92	2	290.11	7	340.51	2
239.42	2	290.97	7	343.73	2
242.67	2	293.04	7	345.33	2
243.75	1	294.89	7	346.71	5
244.50	2	296.40	7	351.39	2
246.90	2	297.63	7		
248.77	2	299.60	7		
250.55	2	302.08	7		
252.20	2	303.53	7		
253.39	2	304.89	2		

Syracuse Division Crossovers

USAGE RESTRICTION CODES

CODE	DESCRIPTION
1	CARS AND PICKUP TRUCKS ONLY
2	VEHICLES *OVER 10,000 LBS MUST* TURN FROM RIGHT SHOULDER
3	NO USAGE DURING COMMUTER HOURS
4	*NO USE ALLOWED*
5	*ALL VEHICLES MUST* TURN FROM RIGHT SHOUDLER
6	OBSERVER MAY BE REQUIRED
7	VEHICLES MAY TURN FROM LEFT SHOULDER

NOTE: The above listed codes shall not apply to vehicles engaged in highway operations such as snowplowing (snow & ice), provided the width of the crossover is longer than the vehicle making the U-Turn. These vehicles are exempt by the Thruway Traffic Safety Manual, section 7.6.1 and NYS Vehicle and Traffic Law, section 1103.

SUPPLEMENTAL INFORMATION FOR BIDDERS

Supplemental information is available to bidders. As indicated below, information is either available on the Thruway Authority's website with the contract plans and proposal or available in electronic format from the Thruway Authority upon request prior to or after the letting date.

The bidder's signature on this proposal certifies that they have made themselves aware of the availability of the information indicated below prior to the letting date.

INFORMATION	NOT AVAILABLE	AVAILABLE ON THRUWAY AUTHORITY WEBSITE
Engineer Estimate Quantity Workups	X	
Utility Estimate Sheets with Names of Utility Officials	X	
Earthwork Cross Section Sheets	X	
Earthwork Sheets	X	
Drainage Estimate Sheets	X	
Sign Face Layouts	X	
Subsurface Exploration Logs	X	
Rock Core Evaluation Logs and Photographs	X	
Compression Test Data from Rock Samples	X	
Pavement Core Logs and Photographs	X	
Logs Showing Laboratory Description of Soil Samples	X	
Laboratory Test Data from Soil Samples	X	
Rock Outcrop Maps	X	
Record Plans	X	
Applicable Asbestos Blanket Variances	X	
Storm Water Pollution Prevention Plan	X	
Shop Drawings	X	
CADD Files of Contract Plans (Unofficial - Not signed or stamped)	X	
Special Reports or Other Information – Hazardous Report		X

Hard copies of the supplemental information indicated above are not available. Contractors shall be responsible for their own hard copies of this information at no additional cost to the Authority.

REVISIONS TO NYSDOT STANDARD SPECIFICATIONS

NEW YORK STATE THRUWAY AUTHORITY ADDENDUM TO THE STANDARD SPECIFICATIONS

The Standard Specifications published by the New York State Department of Transportation shall form a part of the agreement. The dated edition that applies to this contract is provided on the front cover of the Proposal. All work contemplated under this contract is to be covered by, and be in conformance with, the Standard Specifications as modified by The New York State Thruway Authority Addendum (TA) to the Standard Specification Books.

The officially adopted Thruway Authority Addendum (TA) to the NYSDOT Standard Specification Books is available on the Thruway Authority website at:
http://www.thruway.ny.gov/business/addendum/index.html
The most recent version of the TA, prior to the project Letting Date, shall apply to this agreement.

All special notes bound in this proposal shall be incorporated. If a conflict exists between the special specifications and/or provisions set forth in this proposal and the specifications and/or provisions set forth in the New York State Department of Transportation's Standard Specifications, those in the Proposal shall govern.

SPECIAL SPECIFICATIONS

SPECIAL NOTE
SPECIAL SPECIFICATION PAY ITEM NUMBERS

The Contractor's attention is directed to the special specification pay item formats used in this contract. Special specification pay items may be presented in two (2) different formats:

Format 1: Pay items for a special specification will have three (3) digits to the left of the decimal point and up to eight (8) digits to the right of the decimal. Spaces may appear in the third to sixth places after the decimal. The 7th and 8th digits to the right of the decimal will represent the origin of the specification.

Format 2: Pay items for a special specification will have three (3) digits to the left of the decimal point and up to eight (8) digits to the right of the decimal. Dashes may appear in the third to sixth places after the decimal. The 7th and 8th digits to the right of the decimal will represent the origin of the specification.

Where items in this contract appear in multiple formats, the formats shall be equated to each other as illustrated below:

FORMAT 1	**FORMAT 2**
XXX.XX XX	XXX.XX--------XX
XXX.XXXX XX	XXX.XXXX----XX
XXX.XXXXXXX	XXX.XXXXXXXX

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END OF TABLE OF CONTENTS

SECTION 00 03 00

INFORMATION AVAILABLE TO BIDDERS

PART 1 – GENERAL

1.1 EXISTING REPORTS AND SURVEYS

A. Prior to bidding, Bidders may at their expense make their own investigations to satisfy themselves as to site conditions, but such investigations will be performed only under time schedules and arrangements approved in advance by the Authority. Proposed site visits must be approved by the Authority.

B. Information described below is exclusively for use on this specific Project.

1.2 TOPOGRAPHIC SURVEY

A. A topographic survey with respect to the project site was provided for the Authority by Colliers Engineering and Design. This survey is available for review as supplemental information on the Authority's website.

B. This survey identifies grade elevations prepared primarily for the use of the Authority and Architect/Engineer in establishing new grades and establishing site improvements shown on the Contract Documents. The Contractor is responsible for field verification of all survey information provided.

1.3 HAZARDOUS MATERIALS SURVEY

A. A limited hazardous materials survey was conducted by Beardsley Architects and Engineers on December 29, 2016. It is available for review as supplemental information on the Authority's website.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION 00 03 00

ITEM 627.0001 25 GENERAL REQUIREMENTS

01. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0001 25 GENERAL REQUIREMENTS

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 01 10 00 – SUMMARY

B. Section 01 33 00 – SUBMITTAL PROCEDURES

C. Section 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

D. Section 01 52 00 – MAINTENANCE OF PLANT OPERATIONS DURING CONSTRUCTION

E. Section 01 55 26 – WORK ZONE TRAFFIC CONTROL

F. Section 01 77 00 – CLOSEOUT PROCEDURES

6.02 This item shall include, but not be limited to, the following:

A. The work includes managing all administrative and procedural requirements for project closeout, including preparation of submittals, punch lists, coordination of Substantial and Final Completion inspections, and submission of required closeout documentation such as warranties, certificates, and record information.

B. It requires completing system startup, training, final testing, and turnover activities, along with restoration of temporary facilities and correction of incomplete or deficient work. The scope also includes performing comprehensive final cleaning and preparing the project for Owner occupancy and final acceptance.

C. Application of required permits and execution of traffic control requirements including but not limited to work at the treatment plant and access required to facilitate item 627.0033 25 Utilities (Section 33 01 30.72 Cured in Place Piping).

D. The work includes providing, operating, and maintaining all temporary utilities, facilities, and controls needed to support construction, including water, sewer, power, lighting, heating, sanitation, and communication services. It also requires installation of temporary offices, access roads, signage, fencing, erosion and sedimentation controls, dust control, and security and protection measures to safeguard personnel, the public, and existing facilities. Upon completion, all temporary facilities must be removed and disturbed areas restored in accordance with regulatory and contract requirements.

E. Common use field office in accordance with Section 01-50-00 – Temporary Facilities and Controls.

F. Initial cleaning of the sludge holding tank and cleaning water associated with sludge holding tank as well as and draining and hauling of any remaining sewage in the existing tanks, pipes, and other structures that cannot be treated on site shall be hauled prior to the start of work. Can be estimated as 35,000 gal.

G. Sewage Hauling:

1. Temporarily pump and store wastewater within existing sludge holding tank while the wastewater treatment plant processes are offline (maximum of 120 days).

ITEM 627.0001 25 **GENERAL REQUIREMENTS**

2. Wastewater shall be hauled off by a licensed hauler to another licensed wastewater treatment plant.
3. Contractor assumes all cost for storage, transfer, hauling, and disposal of the wastewater.
4. Contractor shall assume 1,200,000 gal of sewage as the expected maximum for 120 days of work.
5. The Contractor must coordinate handling, separation, transportation, and lawful disposal of materials in accordance with regulatory requirements and approved procedure.
6. All costs pertaining to influent storage, transfer, and hauling required to implement the sequencing described in Section 01 10 00 – Summary shall be included in this Item; no separate payment will be made under any other Bid Item.

SECTION 01 10 00

SUMMARY

PART 1 – GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification:
   1. PROJECT: “Rehabilitation of the Wastewater Treatment Plant at Port Byron Service Area at Milepost 310.2” (Project)
   2. PROJECT LOCATION: Wastewater Treatment Plant (WWTP) located at the Port Byron Service Area. Port Byron Service Area on the eastbound lane of I-90 between Exit 41 (Waterloo) and Exit 40 (Weedsport) in the Town of Montezuma, Cayuga County. It is located at milepost 310.2 on the eastbound lane of the New York State Thruway (Interstate 90).
   3. OWNER: New York State Thruway Authority (AUTHORITY).

B. Engineer Identification: The Contract Documents dated August 2026 were prepared for Project by Colliers Engineering & Design Architecture, Landscape Architecture, Surveying CT, P.C. (CED).

1.2 CONTRACT

A. Project will be constructed under a General Construction Contract

1.3 WORK SUMMARY

A. The proposed project includes rehabilitation of the existing Port Byron Service Area Wastewater Treatment Plant to replace aging equipment, improve operational efficiency, enhance worker safety, and maintain long-term regulatory compliance. The work focuses on targeted upgrades to existing infrastructure rather than full plant replacement.

B. Major elements of the proposed work include:
   i. Influent Pump Station Improvements – Replace two existing pumps with new pumps affixed with mixing valves and associated control panel and electrical components to improve reliability and reduce maintenance.
   ii. Headworks Improvements – Install concrete to narrow the channel upstream of the comminutor. Install new aluminum stop gate on effluent to EQ tank in the flow diversion structure.
   iii. Equalization Tank and Sludge Handling Improvements – Convert half of existing equalization tank into a new sludge holding tank with decant capability, abandon and demolish the existing sludge holding tank. Replace the blowers and air piping to treat the new EQ tank and install new pumps in the EQ tank.
   iv. Pumping and Process Equipment Replacement – Replace sludge pumps, trickling filter feed pumps and associated process piping in the control building basement. Replace trickling filter media, distributor mechanism, rotating arm, and underdrain system.

v. Structural improvements – Replace Trickling Filter roof with new aluminum dome with skylights, louvers, exhaust fan and sidewalls to increase the headroom. Replace the stairway access to the trickling filter with a platform shared between trickling filter and control building.

vi. Clarifier Upgrades – Replace chain-and-flight equipment within the secondary clarifier for scum collection.

vii. Control Building and Wet Well Modifications – Wet well opening within the control building to be filled with concrete and sealed with Sika Swellstop or approved equal to eliminate potential for hazardous gas migration, replace exhaust fan to meet NFPA 820 requirements, and provide non-slip flooring for worker safety.

viii. Sand Filter Improvements – Replace the siphon bell in the dosing chamber. Replace timber framing around sand filter beds.

ix. Effluent Pipe Improvements – Install cured-in-place pipe lining along 70-linear feet of the 30-inch effluent pipe.

x. Site and Yard Improvements – Replace all buried yard valves, replace existing access hatches with fall-protection hatches, provide concrete sidewalks to connect various process equipment, and perform limited site restoration as needed. Install new 6-inch pipe from sludge pumps to new sludge holding tank.

xi. Fire Alarm and Communication Systems – Install a fire alarm and occupant notification system in occupied spaces, and add an alarm communication system with auto-dialer capability to transmit critical alarms to operators and NYSTA systems.

xii. Electrical and Controls Modifications – Modify branch circuits, conduits, disconnects, and control wiring as required to support new equipment, reuse existing electrical infrastructure where feasible, and integrate alarm and monitoring functions into the NYSTA intranet.

C. This scope of work rehabilitates the existing treatment plant while maintaining the current permitted capacity.

D. Use of Premises
1. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by OWNER's right to perform work or to retain other contractors on portions of Project.

1.4 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 48-division format and CSI/CSC's "MasterFormat" numbering system.
1. Section Identification: The Specifications use section numbers and titles to help cross- referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names

of sections in the Contract Documents.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
      a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION 01 10 00

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Submittal procedures.
2. Review of submittals.
3. Schedule of Submittals.
4. Shop Drawings.
5. Samples.
6. Manufacturer’s instructions.

B. Related Requirements:
1. Section 01 77 00 – Closeout Procedures for submitting closeout submittals and maintenance material submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL PROCEDURES

A. Transmit each required submittal using Owner furnished form.

B. Number the submittals as follows:
1. First: Specification section number.
2. Submittal number within the Specification section.
3. Review cycle number.
4. Title of submittal.
5. For example:
    a. 02510-01-01 – Field lock gaskets for DIP (first review cycle)
    b. 02510-01-02 - Field lock gaskets for DIP (second review cycle)
    c. 02510-02-01 – Flange pipe and fittings (first review cycle)
    d. 02510-02-02 – Flange pipe and fittings (second review cycle)
    e. 02510-02-03 – Flange pipe and fittings (third review cycle)

C. Identify Project, Contractor, Subcontractor, and Supplier; pertinent Drawing number and detail

number(s), and Specification sections, as appropriate.

D. Apply stamp, signed or initialed providing certification that includes, at a minimum:
   1. Submittal Number
   2. Deviations: None; As Listed:_____
   3. Reference Specification Section
   4. Reference Drawing Number
   5. Space Requirement: As Designed; As Listed:_____
   6. Representation is made to Owner and Engineer that Contractor has satisfied the requirements of General Conditions Article 6.17.C.1.a through d, associated Supplementary Conditions, and that the Contractor hereby approves this submittal.

   Contractor _____

   Signature _____

   Date _____

   Date _____

E. Schedule submittals to expedite the Project and deliver to parties in the quantities and at the locations specified herein.

F. Identify any and all deviations from Contract Documents.

G. Identify product and/or system limitations which may be detrimental to successful performance of the completed Work.

H. Identify space requirements which differ from those designed and/or shown on the Contract Documents.

I. Provide space for Contractor and Owner review stamps.

J. Revise and resubmit: Identify all changes made since previous submittal in a cover letter or memorandum.

K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

L. Submittals not required will not be recognized or processed.

M. Items shall not be fabricated or delivered without fully approved Shop Drawings.

N. Ensure no associated work begins until associated Shop Drawings are fully approved.

O. Fabrication prior to receiving an “Approved” or “Approved as Corrected – No Resubmittal Required” is at Contractor’s risk

1.4 REVIEW OF SUBMITTALS

A. Review times:
   1. No less than 15 days shall be allowed for Owner's review of submittals and resubmittals unless otherwise specified in the Contract Documents.

B. Review Codes:
   1. Approved
   2. Approved as Corrected – No Resubmittal Required
   3. Approved as Corrected – Resubmit Written Responses and Requested Information
   4. Revise and Resubmit
   5. Not Approved
   6. Informational Purposes Only

C. Payment will not be made for any items requiring submittals until no further submittals are required for the item.

1.5 SCHEDULE OF SUBMITTALS

A. Submit a PDF copy of preliminary Schedule of Submittals.

B. Revise and resubmit until acceptable to Owner.

1.6 SHOP DRAWINGS

A. Provide information as required by individual Specification sections.
   1. Shop Drawing submittals shall include all descriptive data, performance characteristics, material specifications, spare parts list, drawings, piping diagrams, wiring schematics, and shall be complete and accurate to indicate item-by-item compliance with the Contract Documents.
   2. Shop Drawings shall be drawn at scales matching those on the Drawings depicting the same items.
   3. All catalog cuts, manufacturer's specifications, drawings, and verbal descriptions shall be clearly marked to allow identification of the specific products used.
   4. If the submittal deviates from the requirements of the Specifications in any way, it shall be clearly marked in the submittal with the justifying reason stated for evaluation by Engineer.

1.7 SAMPLES

A. Provide Samples of submitted materials as required by individual Specification sections.

B. Submit Samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.

C. Submit Samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Owner's selection.

D. Include identification on each Sample, with full Project information.

E. Submit the number or samples specified in individual Specification sections; one of which will be retained by Owner.

F. Reviewed samples which may be used in the Work are indicated in individual Specification sections.

1.8 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual Specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for Shop Drawings.

B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.9 APPLICATION FOR APPROVED EQUAL PRODUCTS

A. In instances where a product specification allows an approved equal, the contractor may submit an alternative product during submittal review after bidding. The submittal shall include all requirements of the related specification and Section 1.6 Shop Drawings.

B. Products submitted shall also highlight in the shop drawing where each design criteria is equivalent to those defined in the specifications

1.10 SUBSTITUTION REQUEST

A. In instances where a product substitution is requested by the Contractor, the attached substitution request form shall be completed after bidding

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION 01 33 00

SUBSTITUTION REQUEST FORM (AFTER BID)

SUBSTITUTION PROCEDURES

GENERAL INFORMATION

Date	
Bid Package	
To	
From (Contractor)	
Project	
Contractor/Subcontractor	

SPECIFIED ITEM

SPECIFICATION SECTION	PAGE	PARAGRAPH	DESCRIPTION

PROPOSED SUBSTITUTION

MANUFACTURER: _____

PRODUCT NAME/MODEL: _____

DESCRIPTION: _____

ATTACHED SUPPORTING DOCUMENTATION

- ☐ PRODUCT DATA
- ☐ TECHNICAL SPECIFICATIONS
- ☐ SHOP DRAWINGS
- ☐ CATALOG CUTS
- ☐ PERFORMANCE DATA
- ☐ TEST REPORTS
- ☐ PHOTOGRAPHS
- ☐ CERTIFICATIONS
- ☐ INSTALLATION INSTRUCTIONS
- ☐ WARRANTY INFORMATION
- ☐ DESCRIPTION OF REQUIRED CHANGES TO CONTRACT DOCUMENTS
- ☐ COST COMPARISON

☐ OTHER: _____

CONTRACTOR CERTIFICATION

☐ The proposed substitution does not affect dimensions shown on the contract drawings.

☐ The contractor shall bear all costs associated with changes to the design, engineering, detailing, coordination, and construction resulting from the requested substitution.

☐ The proposed substitution will have no adverse effect on other trades, construction schedule, code compliance, performance, operation, maintenance, or specified warranties.

☐ Maintenance services and replacement parts are readily available through local suppliers.

☐ This substitution request is submitted within seven (7) calendar days after issuance of the notice of intent to award.

☐ The proposed substitution is equal to or superior to the specified product in function, appearance, quality, durability, performance, and life-cycle cost.

☐ All differences between the specified product and the proposed substitution have been fully identified and disclosed.

CONTRACTOR'S JUSTIFICATION

reason for request:

☐ PRODUCT UNAVAILABLE
☐ EXCESSIVE LEAD TIME
☐ COST SAVINGS
☐ IMPROVED PERFORMANCE
☐ MANUFACTURER DISCONTINUED PRODUCT
☐ OTHER: _____

DETAILED EXPLANATION:

CONTRACTOR INFORMATION

Submitted By	
Title	
Company	
Address	
Telephone	
Email	
Signature / Date	

DESIGN CONSULTANT REVIEW

REVIEW STATUS:

☐ ACCEPTED

☐ ACCEPTED AS NOTED

☐ REVISE AND RESUBMIT

☐ NOT ACCEPTED

COMMENTS / REMARKS:

REVIEWED BY: _____
TITLE: _____
SIGNATURE: _____
DATE: _____

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:
1. Section 01 10 00 – Summary
2. Section 01 55 26 – Work Zone Traffic Control
3. Section 01 77 00 – Closeout Procedures
4. Section 31 20 00 – Earth Moving
5. Section 31 25 00 – Erosion and Sedimentation Controls

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.

C. Water Service: Owner will pay water-service use charges for water used by all entities for construction operations.

D. Electric Power Service: Owner will pay electric-power-service use charges for electricity used by all entities for construction operations.

E. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. Backflow Prevention device(s) shall be required at all connection locations to Owner’s water system.

F. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion and Sedimentation Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
   1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
   2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V AC duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2m) square tack and marker boards.
   3. Drinking water and private toilet.
   4. Coffee machine and supplies.
   5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
   6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
   1. Locate facilities to limit site disturbance as specified in Section 01 10 00 – Summary.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
   1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
      a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
      b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
   2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
   3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

H. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
   1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

I. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
   1. Connect temporary service to Owner's existing power source, as directed by Owner.

J. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
   2. Install lighting for Project identification sign.

K. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install **one** telephone line(s) for each field office.
   1. Provide additional telephone lines for the following:
      a. Provide a dedicated telephone line for each facsimile machine in each field office.
   2. At each telephone, post a list of important telephone numbers.
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Contractor's emergency after-hours telephone number.
      e. Architect's office.

f. Engineers' offices.
g. Owner's office.
h. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

E. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs as indicated on Drawings.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
a. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touchup signs so they are legible at all times.

F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 77 00 – Closeout Procedures.

G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
   1. Comply with work restrictions specified in Section 01 10 00 – Summary.

C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Section 31 25 00 – Erosion and Sedimentation Controls.

D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

E. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip

line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
   1. Prohibit smoking in construction areas.

2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
   1. Protect porous materials from water damage.
   2. Protect stored and installed material from flowing or standing water.
   3. Keep porous and organic materials from coming into prolonged contact with concrete.
   4. Remove standing water from decks.
   5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
   1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
   2. Keep interior spaces reasonably clean and protected from water damage.
   3. Periodically collect and remove waste containing cellulose or other organic matter.
   4. Discard or replace water-damaged material.
   5. Do not install material that is wet.
   6. Discard, replace, or clean stored or installed material that begins to grow mold.
   7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
   1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
   2. Use permanent HVAC system to control humidity.
   3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
      a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
      b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at

time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.

c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 – Closeout Procedures.

END OF SECTION 01 50 00

SECTION 01 52 00

MAINTENANCE OF PLANT OPERATIONS DURING CONSTRUCTION

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Responsibilities.
   2. General Constraints.
   3. Maintenance of Existing Processes, Buildings and Plant Utilities.
   4. Plant Access.

B. Related Requirements:
   1. Contractor shall be responsible for coordination of all equipment, work, etc. specified within this section to all related within the contract documents.

1.02 RESPONSIBILITIES

A. The Wastewater Treatment Plant (WWTP) operates under a New York Pollutant Discharge Elimination System (NYPDES) permit from the New York Department of Environmental Conservation (NYDEC). Flow and processes of the WWTP must be maintained at all times during construction. If, as a result of disruptions due to the Contractor's operations, the WWTP fails to meet permit requirements, the Contractor shall be liable for all fines or other expenses incurred. Except as noted otherwise, sewage flow and plant processes cannot be restricted or limited during the period of construction without permission of the Engineer and the Licensed Plant Operator. To this end, the Contractor shall schedule his operations to prevent undue disturbance to WWTP operations.

B. The Contractor must submit a schedule of operations, which shall include all proposed measures for maintaining plant flow and processes during the course of construction. This proposed schedule must be approved by the Engineer and the Plant Operator prior to commencement of work at the site. The Contractor shall give the Engineer and the Operator seven (7) days written notice prior to any operation, which involves shutdown, partial shutdown, or bypassing of any flow or operation at the WWTP.

C. The Contractor shall perform all necessary preparation work to keep any shutdowns of operations to a minimum. The exact length of time permitted for any specific proposed interruption of service shall be approved by the Engineer and the Operator.

D. The Contractor shall provide all labor, equipment and materials necessary for any bypass pumping, temporary control schemes, or other measures necessary to install the proposed work with a minimum of interruption to WWTP operations. If necessary, construction involving temporary diversion of flow or other interruption of services shall be scheduled during night hours when plant flow is at a minimum. The Owner may require that the Contractor provide manning of bypassing, or other measures, on a seven (7) day per week 24-hour basis, if in the

opinion of the Owner such attendance is necessary to ensure proper plant operation or reliability of the bypass, temporary control scheme, or other measures.

E. Electrical power must be maintained throughout construction. Phasing of shutdowns must be approved by the Engineer and the Operator and seven (7) days written notice shall be given prior to any power shutdown.

F. The Contractor shall not interfere with the employees of the WWTP in performance of any work necessary in order to maintain the facility flow and operation. Where construction operations obstruct or otherwise hinder access to areas necessary for plant operations, the Contractor shall provide safe access for Operator personnel. This shall include, but not be limited to, the construction of ladders, walkways, handrails, or other means of access. All such areas shall be adequately lit for safe night-time access.

G. The CONTRACTOR shall be responsible for ensuring that the Work is performed in such a manner and order to prevent interruption or degradation of the treatment processes occurring at the WWTP.

H. All Work indicated in the CONTRACTOR'S detailed shutdown plan shall remain the responsibility of the CONTRACTOR to complete within the stated allowable shutdown period for shutdowns listed herein, if any, and as agreed to with the OWNER.

I. Work under this Contract shall be scheduled and conducted by the CONTRACTOR so as not to impede any treatment process, reduce the quality of plant effluent or cause odor or other nuisance. In performing the Work indicated and specified, the CONTRACTOR shall plan and schedule his Work to meet the plant operating requirements, and to comply with the constraints and construction requirements as outlined in this section. No discharge of raw or inadequately treated wastewater shall be allowed.

J. The CONTRACTOR shall be responsible for coordinating the general construction and electrical, mechanical, structural, roofing, HVAC, instrumentation and plumbing construction schedules to ensure that temporary requirements for maintaining the operation of all facilities that are required to be online at any given time are met.

K. CONTRACTOR shall install all work to be completed without plant shutdown.

1.03 GENERAL CONSTRAINTS

A. The CONTRACTOR shall schedule and execute all Work so that the plant processes and all plant systems are maintained in continuous operation, unless scheduled herein.

B. The OWNER shall have the authority to order Work stopped or prohibited that would, in his opinion, unreasonably result in interrupting the necessary functions of the plant operations.

C. If the CONTRACTOR impairs the performance or operation of the plant as a result of not complying with specified provisions for maintaining plant operations, then the CONTRACTOR shall immediately make all repairs or replacements and do all Work necessary to restore the plant operation to the satisfaction of the OWNER. Such Work shall progress continuously to completion on a 24 hours per day, seven-day per week basis.

D. The CONTRACTOR shall provide the services of emergency repair crews on call 24 hours per day.

E. CONTRACTOR shall plan for leaking valves, sluice gates and slide gates and continuous dewatering at all excavations, work areas and connection points.

1.05 VEHICULAR AND PERSONNEL ACCESS

A. An unobstructed traffic route through all access gates shall be maintained at all times for the OWNER'S operations personnel and maintenance equipment unless otherwise shown.

B. Any areas disturbed inside and outside of the plant shall be repaired, graded, seeded, etc. as necessary to match pre-construction conditions. If the CONTRACTOR fails to identify existing damaged or disturbed areas prior to the work, the Contactor shall be responsible for repairs to these areas.

C. Plant personnel shall have access to all areas that remain in operation throughout the construction period. The CONTRACTOR shall locate stored material, dispose of construction debris and trash, provide temporary walkways, provide temporary lighting, and other such Work to maintain personnel access to areas in operation. Access and adequate parking areas for plant personnel must be maintained throughout construction.

D. Where portions of plant roads, driveways, parking areas, or other paved areas must be disturbed to install piping, conduits or other buried utilities, CONTRACTOR shall include provisions for maintaining vehicle access including, but not limited to, plant vehicles, hauling operations, and chemical deliveries. Steel plates or other protective device shall be provided if required.

1.06 MAINTENANCE OF EXISTING BUILDINGS AND PLANT UTILITIES

A. Building heating and ventilating for the existing plant structures shall be maintained in service for the entire construction period. Temporary heating and ventilation shall be provided to maintain adequate heating and/or ventilation of facilities where Work is being performed that interrupts existing systems. Temperatures to be maintained in any areas occupied by plant operating personnel shall be at least 65°F and no higher than 85°F. The temperature in all other interior plant areas whether new, existing or temporary shall be maintained at a minimum temperature of 45°F.

B. Electric power, lighting service, process control, fire alarm, gas detection and communications systems shall be maintained in uninterrupted operation in all areas. Individual units may be disconnected as required for replacement, but service shall be available at all times including periods when certain plant utilities are out of service. The CONTRACTOR shall coordinate shutdowns required to minimize the total number of shutdowns necessary to complete construction.

C. Potable water service shall be maintained in continuous service at all times during construction except for short-term shutdowns required for tie-ins and connections. Shutdown of the potable water system shall be fully planned and coordinated through the OWNER and shall be limited to not more than 2 hours, except where otherwise indicated. Existing fire hydrants within the plant site shall be operational at all times.

D. The existing non-potable water services shall be maintained in continuous operation during construction except for short-term tie-ins of new or temporary facilities to existing facilities. The CONTRACTOR shall provide temporary support or relocation or demolition of existing non-potable water facilities to complete the Work indicated. Shutdowns of the non-potable water system shall be fully coordinated with the OWNER and shall be staged so that they do not affect plant operations.

E. All existing sumps and sump pumps shall be maintained in an operable condition with either existing pumps or temporary pumps. Interim piping, power and controls shall be provided as necessary to comply with this requirement.

F. Supply of service and seal water and the necessary connections to existing equipment shall be maintained during construction. Interim piping and seal water supply shall be provided as necessary to comply with this requirement.

1.07 MAINTENANCE OF EXISTING PROCESS

A. Plant processes shall be maintained in service for the entire construction period unless a short term shut down is specified herein. Provide submittals for approval detailing how Contractor operations will affect the Plant Operations and how necessary operations and monitoring will be maintained.

B. Temporary impacts to the Facility will be mitigated as discussed herein.

   a. Removal of the existing systems and installation, startup and testing of the new will necessitate the shutdown the Facility.
      i. The time allowed for the Facility to be out of service is limited to a single one hundred and twenty (120) consecutive calendar day window.
      ii. During the one hundred and twenty (120) day window, sewage shall be routed to the existing sludge holding tank for temporary storage in accordance with Section 33 01 30 – Operation and Maintenance of Sewer Utilities.
      iii. The Contractor shall haul and dispose of raw sewage from the facility to an approved off-site facility as needed, minimum weekly. Contractor shall be reimbursed for all work necessary to haul and dispose of the sewage at the lump sum bid. The number of gallons removed shall be measured at the approved facility. The volume of the tank utilized to remove the liquid shall be recorded. Tanks shall be verified empty prior to filling. Volume of hauled sludge shall be documented and submitted within 5 days of disposal. The lump sum bid shall include all labor, material, equipment, hauling and disposal costs to remove and dispose of the sewage at a licensed facility. Filling of tankers shall take place Monday-Friday, 7:00 AM to 3:30 PM.
      iv. Should the Contractor fail to complete the work necessary to resume operations in the 120-day window, Contractor shall be responsible to haul and dispose of the sewage at its own cost.
      v. Maintain access for the Plant personnel to all existing facilities during the work.
   b. Electrical connections to existing panels/MCCs will not interrupt existing facilities.

C. Under no circumstances shall sewage be allowed to flow into any trench and mix with the groundwater or be diverted to drainage systems. Hoses for the pumping operation shall be of sufficient quality and strength to withstand vehicular traffic passing over them. Hose couplings shall

be tight and free from leaks. Any hose that leaks shall be removed and replaced by a watertight hose.

D. By-pass pumping will be permitted only during normal working hours, unless otherwise approved by the Engineer.

E. At the end of each day's work, the Contractor shall temporarily reconnect all pipes disconnected during the course of the work so that there is a continuous pipeline similar to the existing line, which was removed. Temporary piping shall be equal in diameter to the existing pipe, and the newly constructed line may be used. All temporary connections shall be watertight.

1.08 COORDINATION

A. The CONTRACTOR shall coordinate the requirements of this section with those listed elsewhere in the Contract Documents.

1.09 DRAINING, WASH DOWN, CLEANING AND TURNOVER OF FACILITIES

A. Isolation, draining and wash down of tanks, channels or other process equipment is to be performed by the CONTRACTOR. The CONTRACTOR shall submit for the OWNERS approval a plan for the isolation, draining and wash down of tanks, channels or other process equipment.

B. Following draining and hose down of all areas in which the CONTRACTOR or its Subcontractors are working, the CONTRACTOR shall be responsible for cleaning the facilities to the extent necessary to perform the required Work and to protect the health and safety of the CONTRACTOR'S personnel. This requirement includes removal and disposal of any residue, solids, debris or other material.

C. The CONTRACTOR shall submit for the OWNER'S approval the design, furnish, install and maintain stop logs, bulkheads and similar flow isolation devices prior to proceeding with the Work. The CONTRACTOR will submit with its request all Shop Drawings and design calculations. The installation and removal of any flow isolation device shall be done only after receiving the OWNER'S written approval of the design and permission to proceed.

1.10 SUBMITTALS

A. Prior to the commencement of the Work the CONTRACTOR shall submit to the OWNER, for written approval, a detailed overall Work plan detailing the CONTRACTOR'S plan for performing the Work in conjunction with the operation of the Plant.

B. The CONTRACTOR shall incorporate into the schedule, all constraints identified in this section. Any proposed deviations or modifications to the constraints shall be submitted for approval prior to implementation.

C. The CONTRACTOR is free to propose modifications to existing or proposed structures to accommodate construction or to facilitate with equipment installation. Where structural modification of an existing or proposed facility is requested, the request shall be accompanied by calculations, Contract Drawings, etc., sealed by a New York registered Professional Engineer specializing in structural design. The OWNER may deny or approve the request at his discretion.

PART 2 – PRODUCTS

2.01 GENERAL

A. The CONTRACTOR shall provide all labor, materials, equipment and incidentals to perform the Work required and specified in this Specification. Work shall be arranged and performed by personnel that are fully qualified and equipped to provide the services. Standby/redundant equipment/pumps shall be provided wherever utilized or required. Repair crews shall be available on a 24 hours per day, seven (7) days per week basis.

PART 3 – EXECUTION

3.01 EXECUTION

A. Execution shall be performed in accordance with the approved Construction Schedule and Work Plan.

END OF SECTION 01 52 00

SECTION 01 55 26

WORK ZONE TRAFFIC CONTROL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work zone traffic control shall be developed and executed following current NYSDOT specification section 619-Work Zone Traffic Control at the time of construction.

B. Related Requirements:
   1. Section 01 10 00 – Summary
   2. Section 01 33 00 – Submittals
   3. Section 01 77 00 – Closeout Procedures

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

All references to section 01 55 26 shall follow requirements of NYSDOT Specification 619 – WORK ZONE TRAFFIC CONTROL. The most current standards can be found on the NYSDOT website: https://www.dot.ny.gov/main/business-center/engineering/specifications/updated-standard-specifications-us

END OF SECTION 01 55 26

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
   1. Field surveying.
   2. Close out procedures.
   3. Starting of systems.
   4. Demonstration and instructions.
   5. Project record documents.
   6. Operation and maintenance data.
   7. Spare parts and maintenance products.
   8. Product warranties and product bonds.
   9. Substantial Completion
   10. Final Completion
   11. Examination.
   12. Execution.
   13. Cutting and patching.
   14. Protecting installed construction.
   15. Final cleaning.
   16. Certification, Conveyance, and Plats.

B. Related Requirements:
   1. Section 01 33 00 – Submittal Procedures.
   2. Section 01 50 00 – Temporary Facilities and Controls.

1.2 DEFINITIONS

A. Substantial Completion: Stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

B. List of Incomplete Items (Punch List): Contractor-prepared list of items to be completed or corrected prior to Substantial Completion and Final Completion.

1.3 FIELD SURVEYING

A. A Licensed Land Surveyor shall be employed to provide a preconstruction survey of all utilities and appurtenances per the approved construction plans. Certifications of this work shall be provided to OWNER prior to installation. Any conflicts noted with the survey shall be noted and changes to the construction plans shall be approved prior to installation.

B. Locate and protect survey control and reference points. Promptly notify Engineer of

discrepancies discovered.

C. Control datum for survey is established by Engineer-provided survey and indicated on Drawings.

D. Verify easements; confirm Drawing dimensions and elevations.

E. Proposed easements shall be staked prior to installation of utilities.

F. Provide field surveying and recording services. Establish elevations, lines, and points using recognized survey practices.

G. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.

H. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

I. Final Record Survey: Prior to Substantial Completion, submit markup of final record in accordance with Project Record Documents in this section.

1.4 CLOSEOUT PROCEDURES

A. Prerequisites to Utility Activation: Complete following items before requesting Utility Activation, either for entire Work or for portions of Work:
1. Complete testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to OWNER's operating and maintenance personnel as specified in compliance with this Section.
2. Submit maintenance manuals, spare parts, Project record documents, markups, gravity sewer video inspection, warranty letters and other similar final record data in compliance with this Section.
3. Coordinate Final Walk-Through inspection by OWNER to establish basis for re- quest that Work is complete.
4. Make final change-over of locks and transmit keys directly to OWNER. Advise OWNER's personnel of changeover in security provisions.
5. Discontinue or change over and remove temporary facilities and services from Project Site.
6. Perform final cleaning according to this Section.

1.5 STARTING OF SYSTEMS

A. Coordinate schedule for startup of various equipment and systems.

B. Notify Engineer seven days prior to startup of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute startups under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.

G. When specified in individual Specification Sections, require manufacturer to provide authorized representatives who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.

H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

1.6 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to OWNER personnel.

B. Demonstrate Project equipment and instructed by authorized manufacturer's representative who is knowledgeable about the Project.

C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with OWNER personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

1.7 PROJECT RECORD DOCUMENTS

A. Maintain one set of the following record documents; record actual revisions to the Work:
1. Drawings.
2. Specifications.
3. Reviewed Shop Drawings, product data, and Samples.
4. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Record information concurrent with construction progress, not less than weekly. Report recording status at progress meetings.

D. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
2. Product substitutions or alternates used.
3. Changes made by Addenda and modifications.

E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
   1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
   2. Include locations of concealed elements of the Work.
   3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
   4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
   5. Identify and locate existing buried or concealed items encountered during Project.
   6. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   7. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   8. Field changes of dimension and detail.
   9. Details not on original Drawings.

F. Certified, surveyed record drawings ("as-built" plans), sealed by a NY licensed Professional Land Surveyor shall be furnished to the OWNER by the Contractor of Record upon completion and acceptance of the infrastructure by the OWNER. The "as-built" plans shall conform to the as-built checklist included here- in.

G. For sewer projects, the "as-built" plans shall include accurate information regarding pipe size, pipe material, pipe length, manhole construction (size of manhole, invert, rim, alignment, location), services, and pump stations along with any relevant rights- of-way, property boundaries and easements. Plans shall also include sewer profiles showing any utility crossings and separations along with the aforementioned information.

H. For pump station projects, the "as-built" plans shall include accurate information regarding interior and exterior pipe sizes, material, length, as well as all structural dimensions of the pump station, all electrical equipment (make and model), pump in- formation (make, model, and impeller size), and site layout information. Top plan, sectional plan, and full cross-section views are required on the "as-built" plans.

I. For force main projects, the "as-built" plans shall include accurate information regarding pipe size, pipe material, pipe length, horizontal and vertical elevations, valve locations (and turn direction), hydrant locations, fitting locations, services, and blow-off lo- cations along with any relevant rights-of-way, property boundaries and easements.

J. The final elevation of the force main shall be surveyed every 50', at each change in horizontal and vertical direction, and at each valve location with final grade in place.

K. For water projects, the "as-built" plans shall include accurate information regarding pipe size, pipe material, pipe length, horizontal and vertical elevations, valve locations (and turn direction), hydrant locations, fitting locations, services, and blow-off locations along with any relevant rights-of-way, property boundaries and easements.

L. The final elevation of the water main shall be surveyed every 50', at each change in horizontal

and vertical direction, and at each valve location with final grade in place.

M. Submit marked-up paper copy documents to Engineer at each payment request and before Substantial Completion.

N. Digital “as-built” information shall be provided by the Engineer of Record in AutoCAD format and PDF format with seal, signature, and date by surveyor and engineer and shall include all information required on the “as-built” drawings. No other digital for- mats will be accepted.

O. Submit complete pdf of all waste disposal weigh tickets in accordance with 02-41-00 Section 1.7.D

P. Submit complete pdf of all hauling receipts in accordance with 01-52-00 Section 1.07.a.iii

1.8 OPERATION AND MAINTENANCE DATA

A. Submit in PDF composite electronic indexed file.

B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.

C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.

D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Contact information for warranty items.
      g. Safety precautions are to be taken when operating and maintaining or working near equipment.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop Drawings and product data.

b. Certificates.
c. Photocopies of warranties and bonds.

1.9 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.

B. Deliver to Project Site and place in location as directed by OWNER; obtain receipt prior to final payment.

1.10 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.

B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include table of contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final completion.

G. Time of Submittals:
1. For equipment or component parts of equipment put into service during construction with OWNER’s permission, submit documents within ten days after acceptance.
2. Make other submittals prior to final completion.

1.11 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties,

workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number.
    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
5. Submit testing, adjusting, and balancing records.
6. Submit sustainable design submittals not previously submitted.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
6. Advise Owner of changeover in utility services.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements.
10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, which must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.12 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final

Completion, complete the following:

1. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
3. Submit pest-control final inspection report.
4. Submit Final Completion photographic documentation.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.13 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
   2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
   3. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Engineer.
      d. Name of Contractor.
      e. Page number.
   4. Submit list of incomplete items in the following format:
      a. MS Excel Electronic File: Engineer will return annotated file.
      b. PDF Electronic File: Engineer will return annotated file.
      c. Web-Based Project Software Upload: Utilize software feature for creating and updating lists of incomplete items (punch list).
      d. Three Paper Copies: Engineer will return two copies.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that existing Site conditions are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Examine and verify specific conditions described in individual Specification Sections.

C. Verify that utility services are available with correct characteristics and in correct locations.

3.2 EXECUTION

A. Comply with manufacturer's installation instructions, performing each step, in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.

D. Conduct a preconstruction survey, staking out all proposed easements, right-of-ways, and proposed utilities. Provide a certificate of each survey once completed.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
   1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
   2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.

F. Allow for expansion of materials.

G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for application indicated.
   1. Refer questionable mounting heights choices to Engineer for final decision.

H. Adjust operating products and equipment to ensure smooth and unhindered operation.

I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.3 CUTTING AND PATCHING

A. Employ skilled and experienced installers to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements affecting:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Efficiency, maintenance, or safety of element.
   4. Work of OWNER or separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
   1. Fit the several parts together, to integrate with other Work.
   2. Uncover Work to install or correct ill-timed Work.
   3. Remove and replace defective and nonconforming Work.
   4. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute Work by methods to avoid damage to other Work and to provide proper sur- faces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products according to requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through sur- faces.

H. Maintain integrity of wall, ceiling, or floor construction, completely seal voids.

I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest joint or intersection; for equipment assembly, refinish entire unit.

J. Identify hazardous substances or conditions exposed during the Work to Engineer for decision or remedy.

3.4 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual Specification Sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.

C. Protect corrosion protected (coated) surfaces. When activity is necessary, obtain recommendations for protection from coating material manufacturer.

D. Prohibit traffic from landscaped areas.

3.5 FINAL CLEANING

A. Execute final cleaning prior to final Project assessment.

B. Clean Site and Facilities; sweep paved areas, rake clean landscaped surfaces.

C. Remove waste and surplus materials, rubbish, and construction facilities from Site.

3.6 CERTIFICATION, CONVOYANCE, AND PLATS

A. Follow the Certification, Conveyance, and requirements outlined in the Development Process and Procedures Manual.

B. Record Drawings shall be provided with accurate information including final horizontal and vertical locations of all utilities.

C. The final survey shall be conducted with respect to the final grade. All horizontal and vertical direction changes shall be captured, and each valve location.

END OF SECTION 01 77 00

ITEM 627.0002 25 **EXISTING CONDITIONS**

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0002 25 **EXISTING CONDITIONS**

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 02 41 00 – DEMOLITION
B. Section 02 82 13 – ASBESTOS ABATEMENT
C. Section 02 83 04 – HANDLING OF LEAD CONTAINING MATERIALS

6.02 This item shall include, but not be limited to, the following:

A. The work includes selective and full demolition of designated buildings, structures, utilities, paving, masonry, concrete, and electrical systems as shown on the drawings, along with required saw cutting, patching, and abandonment or relocation of services. The Contractor must coordinate utility shutdowns, properly cap or fill abandoned lines, manage salvaged and reusable materials, and dispose of unsalvageable materials in accordance with applicable regulations. The scope also requires comprehensive protection measures for existing facilities, personnel, and the environment, including dust control.

B. Demolition of existing pumps, appurtenances, diffusers and blowers for the equalization tank

C. Demolition of existing pumps and piping in the basement of the control building.

D. Demolition of existing secondary clarifier chain and flights

E. Removal of existing trickling filter media, underdrain, rotary distributor, roof, and stairs.

F. Demolition of dosing chamber internals

G. Demolition and abandonment of sludge holding tank and associated piping

H. Removal of existing sand filter bed timber framing

I. Removal of all yard valves for replacement under Item 627.0033 25

J. Cleaning, Removal and Hauling required to initially empty existing tanks and pipes and to maintain plant operations shall be paid under Item 627.0001 25 and not separately measured or paid under this Item.

K. Compliance with OSHA requirements for handling asbestos and/or lead containing materials. Reference the Limited Hazardous Materials Survey Report for a complete list of materials sampled and results.

SECTION 02 41 00

DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 specification sections, apply to this section.

1.2 SUMMARY

A. Section Includes
   1. Demolition

B. Related Sections
   1. Section 02 82 13 – Asbestos Abatement
   2. Section 02 83 04 – Handling of Lead Containing Materials
   3. Section 31 23 16 – Excavation.
   4. Section 31 25 00 – Erosion and Sedimentation Controls.

1.3 DEFINITIONS

A. ACM – Asbestos-containing material.

B. Demolition – Dismantling, razing, destroying, or wrecking of any fixed building or structure or any part thereof.

C. Modify – Provide all necessary material and labor to modify an existing item to the condition indicated or specified.

D. Relocate – Remove, protect, clean and reinstall equipment, including electrical, instrumentation, and all ancillary components require to make the equipment fully functional, to the new location identified on the Drawings.

E. Renovation – Altering a facility or one or more facility components in any way.

F. Salvage/Salvageable – Remove and deliver, to the specified location(s), the equipment, building materials, or other items so identified to be saved from destruction, damage, or waste; such property is to remain that of the Owner. Unless otherwise specified, title to items identified for demolition shall revert to the Contractor.

G. Universal Waste Thermostat – A temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of 40 CFR 273.

1.4 REGULATORY AND SAFETY REQUIREMENTS

A. Comply with federal, state, and local hauling and disposal regulations. In addition to any applicable requirements, Contractor's safety requirements shall conform to ANSI A10.6.

1.5 USE OF EXPLOSIVES

A. Use of explosives for demolition is not permitted.

1.6 ENVIRONMENTAL PROTECTION

A. Prior to beginning demolition, the Contractor shall establish temporary erosion and sediment control in accordance with Section 31 25 00 – Erosion and Sedimentation Controls.

1.7 SUBMITTALS

A. Certified Waste Characterization Report: Provide documentation of laboratory testing results proving the hazardous or non-hazardous status of the trickling filter media.

B. Disposal Facility Acceptance: Provide written confirmation from a permitted landfill stating the submitted lab results have been reviewed and approved by the receiving landfill for the material for disposal.

C. Hauler Permits: Provide a copy of the transporter's valid 6 NYCRR Part 364 Waste Transporter Permit.

D. Disposal Receipts: Certified weight tickets and completed waste manifests signed by the landfill, to be submitted within 5 days of disposal. Including but not limited to trickling filter media, construction debris, and hazardous waste.

PART 2 - PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 EXISTING FACILITIES TO BE DEMOLISHED OR RENOVATED

A. Facilities:
   1. Buildings and adjacent designated areas scheduled for complete demolition are as shown on the Drawings.
   2. Portions of buildings and other areas scheduled for selective demolition, partial demolition, and renovation are as shown on the Drawings.

B. Utilities and Related Equipment:
   1. Notify Owner or appropriate utilities to turn off affected services at least 48 hours before starting demolition or renovation activities.

2. Remove existing utilities as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approve by the Owner.
3. When utility lines are encountered that are not indicated on the Drawings, notify the Owner prior to further work in that area.
4. Remove meters and related equipment and deliver to a location as determined by the Owner.
5. Excavate and remove utility lines serving buildings to be demolished to a distance of 10 feet beyond the outside perimeter of the demolition.
6. Provide a permanent leak-proof closure for water and gas lines.
7. For lines less than 8 inches in diameter, plug sewer lines with concrete to a minimum plug length of 2 feet to prevent groundwater infiltration. For lines 8 inches and larger, or for all pipes abandoned under a roadway, completely fill the abandoned line with flowable fill in accordance with Section 31 23 16 – Excavation

C. Hazardous Materials – Reference 02 82 13 Asbestos Abatement and 02 83 04 Handling of Lead Containing Materials.

D. Paving and Slabs - Provide neat saw cuts at limits of pavement removal as indicated.

E. Masonry – Saw cut and remove masonry so as to prevent damage to surfaces to remain and to facilitate the installation of new Work. Where new masonry adjoins existing, the new Work shall abut or tie into the existing construction as indicated.

F. Concrete – Saw concrete along straight lines to a depth of not less than 2 inches. Make each cut in wall perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished Work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete. Where new concrete adjoins existing, the new Work shall abut or tie into the existing construction as indicated.

G. Patching:
1. Where removals leave holes and damaged surfaces exposed in the finished Work, patch and repair to match adjacent finished surfaces as to texture and finish.
2. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new Work.
3. Fill holes and depressions left because of removals in existing surfaces with an approved patching material, applied in accordance with the manufacturer's printed instructions.

H. Electrical:
1. Cut off concealed or embedded conduit, boxes, or other materials a minimum of 3/4 inch below final finished surface.
2. When removing designated equipment, conduit and wiring may require rework to maintain service to other equipment.
3. Rework existing circuits or provide temporary circuits as necessary during renovation to maintain service to existing lighting and equipment not scheduled to be renovated. Existing equipment and circuiting shown are based upon limited field

surveys. Verify existing conditions, make all necessary adjustments, and record the Work on the Record Drawings. This shall include, but is not limited to, swapping and other adjustments to branch circuits and relocation of branch circuit breakers with panelboards as required to accomplish the finished Work.

4. Reuse of existing luminaires, devices, conduits, boxes, or equipment will be permitted only where specifically indicated.
5. Raceways and Cabling:
    a. Scheduled for retirement:
        1) Inaccessibly Concealed: Cut off and abandon in place.
        2) Exposed or Accessible: Remove.
    b. Scheduled for future use:
        1) Cap/seal and tag
    c. Schedule for relocation:
        1) Extend existing wiring or run new wiring from the source.
    d. Where the existing raceway is concealed, the outlet box shall be cleaned, and a blank cover plate installed.
    e. Where concealed raceway is uncovered, remove raceway or extend to new location as appropriate.
6. Provide new typewritten panelboard circuit directory cards.

I. Trickling Filter Stone Media:
1. Scope:
    a. The Contractor shall provide all labor, tools, equipment, testing, permits, transportation, and disposal fees required to completely remove and legally dispose of all stone media from the designated trickling filter.
2. Regulatory Compliance:
    a. All work, testing, transport, and disposal shall comply strictly with New York State Department of Environmental Conservation (NYSDEC) 6 NYCRR Part 360, 363, 364, and 371 regulations.
3. Contractor Waste Testing:
    a. The Contractor shall retain an independent, certified laboratory to sample and test the stone media as required by the chosen disposal facility and NYSDEC rules.
    b. Testing must include, at a minimum, TCLP RCRA Metals and any other parameters required by the receiving landfill.
    c. All costs for sampling, laboratory analysis, and profiling shall be borne entirely by the Contractor.
4. Removal and Housing:
    a. Protection of Infrastructure: The Contractor shall use removal methods that prevent any damage to the underlying underdrain system, center column, and concrete walls. Any damage caused by the Contractor's operations shall be repaired at the Contractor's sole expense.
    b. Odor and Runoff Control: The Contractor is solely responsible for managing odors, vectors, and dust. If stockpiled on-site, the media must be placed on and completely covered by heavy-duty plastic sheeting to prevent contaminated stormwater runoff
5. Transportation and Disposal:
    a. Hauled Restrictions: The Contractor shall transport the material using water-

tight, securely tarped vehicles permitted under 6 NYCRR Part 364.

b. Disposal Prohibitions: The stone media shall not be taken to a standard Construction and Demolition (C&D) landfill.

c. Approved Facility: The Contractor must dispose of non-hazardous materials at a permitted 6 NYCRR Part 363 Municipal Solid Waste (MSW) landfill or authorized industrial facility. If material tests hazardous, the Contractor shall be responsible for routing and disposal of materials to a permitted Part 373 hazardous waste facility at no additional cost to the Owner.

6. Post-Removal Cleaning:

a. Following stone removal, the Contractor shall power-wash the remaining underdrain system and filter floor to remove all remaining fragments, grit, and slime.

b. All wash water must be captured and pumped back to the plant headworks as directed by the plant operator.

3.2 PROTECTION

A. Dust and Debris Control:

1. Prevent the spread of dust and debris to the occupied portions of the building and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.
2. Vacuum and dust interior Work areas daily.
3. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to vehicular traffic.

B. Traffic Control Signs – Where pedestrian and driver safety are endangered in the area of removal Work, use traffic barricades with flashing lights.

C. Existing Work:

1. Survey the site and examine the Drawings and Specifications to determine the extent of the Work before beginning any demolition or renovation.
2. Take necessary precautions to avoid damage to existing items scheduled to remain in place, to be reused, or to remain the property of the Owner. Any Contractor-damaged items shall be repaired or replaced as directed by the Owner.
3. Provide temporary weather protection during intervals between removal of existing exterior surfaces and installation of new to ensure that no water leakage or damage occurs to the structure or interior areas of existing buildings.
4. Ensure that structural elements are not overloaded as a result of or during performance of the Work. Responsibility for additional structural elements or increasing the strength of existing structural elements as may be required as a result of any Work performed shall be that of the Contractor. Repairs, reinforcement, or structural replacement must have Owner approval.
5. Do not overload pavements to remain.

D. Weather Protection – For portions of the building scheduled to remain, protect the building interior, materials, and equipment at all times. Where removal of existing roofing is necessary to accomplish the Work, have materials and workmen ready to provide

adequate and temporary covering of exposed areas so as to ensure effectiveness and to prevent loss.

E. Trees – Protect trees within the Site that might be damaged during demolition and are indicated to be left in place using a 6-foot-high fence. The fence shall be securely erected a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Any tree designated to remain that is damaged during the Work shall be replaced in kind, as approved by the Owner.

F. Facilities:
1. Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities.
2. Floors, roofs, walls, columns, pilasters, and other structural elements that are designed and constructed to stand without lateral support or shoring and are determined by the Contractor to be in stable condition, shall remain standing without additional bracing, shoring, or lateral support until demolished, unless directed otherwise by the Owner.
3. Protect all facility elements not scheduled for demolition.
4. Provide interior shoring, bracing, or support to prevent movement, settlement, or collapse of structures or elements to be demolished and adjacent facilities.

G. Protection of Personnel:
1. During demolition, continuously evaluate the condition of the demolished structure and take immediate action to protect all personnel working in and around the demolition site.
2. Provide temporary barricades and other forms of protection to protect Owner's personnel and the general public from injury due to demolition Work.
3. Provide protective measures as required to provide free and safe passage of Owner's personnel and the general public to occupied portions of the structure.

3.3 BURNING

A. The use of burning at the Site for the disposal of refuse and debris will not be permitted.

3.4 RELOCATIONS

A. Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Clean all items to be relocated prior to reinstallation, to the satisfaction of the Owner. Repair items to be relocated which are damaged or replace damaged items with new undamaged items as approved by the Owner.

3.5 BACKFILL

A. Demolition debris shall not be used as backfill material.

3.6 TITLE TO MATERIALS

A. All equipment will be discarded, or may be salvaged, by the Contractor unless specifically identified to remain the property of the Owner in the contract documents.

3.7 DISPOSITION OF MATERIAL

A. Do not remove equipment and materials without the approval of the Owner.

B. Remove materials and equipment that are indicated and specified to be removed by Contractor and deliver to a location to be determined by the Owner.

C. Remove salvaged items in a manner to prevent damage and pack or crate to protect the items from damage while in storage or during shipment. Properly identify containers as to contents.

D. Repair or replace, at the discretion of the Owner, items damaged during removal or storage.

E. The Owner will not be responsible for the condition or loss of, or damage to, property scheduled to become the Contractor's property after Owner's authorization to begin demolition. Materials and equipment shall not be viewed by prospective purchasers or sold on the Site.

F. Owner will not be responsible for the condition or loss of, or damage to, such property after Owner's authorization to begin demolition.

G. Store salvaged items as approved by the Owner or Inspector and remove them from Owner's property before completion of the Contract.

3.8 REUSE OF MATERIALS AND EQUPMENT

A. Remove and store materials and equipment listed to be reused or relocated to prevent damage and reinstall as the Work progresses.

B. Properly store and maintain equipment and materials in the same condition as when removed.

C. Store equipment and material designated to be reused in a location designated by the Owner.

D. Equipment and material designated to be reused shall be cleaned, serviced and checked for proper operability before being put back into service.

E. The Owner shall determine condition of equipment and materials prior to removal.

3.9 UNSALVAGEABLE MATERIAL

A. Concrete, masonry, and other noncombustible materials, except concrete permitted to remain in place, shall be disposed of by the Contractor at a facility permitted to receive

the waste by the appropriate state, federal, or local authority.

B. Combustible material shall be disposed of off-Site.

3.10 CLEANUP

A. Debris and rubbish shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

B. All materials removed from the sewer lines during cleaning operations shall be trapped and removed from the system at the downstream manhole of the section being cleaned. All materials shall be disposed of in compliance with all applicable laws and regulations and in a manner approved by Owner.

C. Under no circumstances shall sewage or solids removed in the cleaning process be dumped onto streets or into ditches, catch basins, storm drains, sanitary sewer manholes, cleanouts, or dumps.

END OF SECTION

SECTION 02 82 13

ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies the procedures for disturbance and removal of existing asbestos-containing materials (ACM) and disposal of removed materials. The results of the testing for ACM are listed in the Limited Hazardous Materials Survey Report bound in the Appendix.

1. The Hazardous Materials report was compiled by an ELAP certified laboratory.
2. In order to determine asbestos content, samples were analyzed by polarized light microscopy (PLM) and/or transmission electron microscopy (TEM).
3. The Bulk Samples are representative of like materials in the Work area. All ACM may not have been sampled.

B. Type of Asbestos Abatement Project:

1. Minor Asbestos Abatement Project: An asbestos project involving the removal, disturbance, repair or handling of less than 10 square feet or 25 linear feet of ACM. The secondary clarifier control panel board is approximately 4 square ft.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Existing Hazardous Material Information: Section 00 03 00.

B. Summary of the Work: Section 01 10 00.

C. Handling of Lead Containing Materials: Section 02 83 04

1.3 REFERENCES

A. New York State Department of Environmental Conservation (DEC) 6NYCRR:

1. Part 360 Solid Waste Management Facilities.
2. Part 364 Waste Transporter Permits.
3. Part 370 Hazardous Waste Management System-General.
4. Part 371 Identification and Listing of Hazardous Wastes.
5. Part 372 Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities.
6. Part 373 Hazardous Waste Management Facilities.

B. Occupational Safety and Health Administration (OSHA): Asbestos Regulations (29 CFR Part 1926.1101).

C. U.S. Environmental Protection Agency (USEPA):

1. National Emission Standards for Hazardous Air Pollutants; Asbestos NESHAP Revision; Final Rule.
2. Asbestos Emergency Response Act (AHERA) (40 CFR Part 763, Subpart E).

D. New York State Department of Labor (DOL): Industrial Code Rule 56.

1.4 DEFINITIONS

A. Authorized Personnel: Facility or the Director's Representative, and all other personnel who are authorized officials of any regulating agency, be it State, Local, Federal or Private entity who possess legal authority for enforcement or inspection of the work.

B. Clearance Criteria: Shall be determined and established by a Certified Asbestos Project Monitor with an independent testing lab employed by the Director's Representative, conforming to all standards set forth by all authorities having jurisdiction, mentioned in the references, and issue the certification of cleaning.

C. Site Specific Variance: Relief in accordance with section 30 of the Labor Law from specific sections of Industrial Code Rule 56 for a specific project.

D. Phase I & II: Asbestos Project phases as defined and subcategorized in ICR 56-2.

1.5 ABBREVIATIONS

A. ASTM: American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

B. CFR: Code of Federal Regulations
Government Printing Office
Washington, DC 20402

C. DOL: New York State Department of Labor
Harriman State Office Building Campus
Albany, NY 12240

D. NIOSH: National Institute for Occupational Safety and Health
Building J.N.E. Room 3007
Atlanta, GA 30333

E. OSHA: Occupational Safety and Health Administration
200 Constitution Avenue
Washington, DC 20210

F. USEPA: United States Environmental Protection Agency
401 M Street SW
Washington, DC 20460

1.6 ASBESTOS SITE SPECIFIC VARIANCE

A. If a site specific variance is sought, the application must be submitted by the contractor's NYS DOL Certified Asbestos Project Designer with 14 days after the Contract Agreement is approved by the Comptroller. Forward the required forms to the Department of Labor for their action.

1.7 SUBMITTALS

A. Product Data: Catalog sheets, specifications and installation instructions for each item specified.

B. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

C. Manufacturer's installation instructions shall be provided along with product data.

D. Submittals shall be provided individually in the order in which they are specified and tabbed.

E. Quality Control Submittals:

1. Notification Compliance Data: Within 2 days after notification is sent to the regulatory agencies submit one copy of each notice sent to each regulatory agency (USEPA and DOL).
2. Asbestos Removal Company Data: Name and address of proposed asbestos removal company and abatement contractor license issued by DOL.
3. Asbestos Worker Certification Data: Name and address of proposed asbestos abatement workers and licenses issued by DOL.
4. Work Plan: Submit one copy of the work plan required under Quality Assurance Article 1.08 (C).
5. Waste Transporter Permit: One copy of transporter's current waste transporter permit from NYS DEC (NYS Part 364 Permit).
6. NYS Part 360 Landfill Permit: Copy of NYS Part 360 permit of landfill to be used for ACM disposal shall be licensed to receive asbestos waste by NYS DEC (NYS Part 360 Permit) and by USEPA. Out of state landfills shall provide licenses from local agencies having jurisdiction.
7. Negative Air Pressure Equipment: Copy of manufacturer's and performance data of all units and HEPA filters used.

F. Asbestos Work Closeout Submittals:

1. Waste Shipment Records and Disposal Site Receipts: Copy of waste shipment record and disposal site receipt showing that the ACM has been properly disposed.

    a. Waste shipment record and disposal site receipt must be received within 35 days of the ACM waste leaving the Site. If receipts are not received within the specified time period, the Director's Representative will notify USEPA in writing within 45 days of the ACM waste leaving the Site.

G. Contract Closeout Submittals:

1. Daily Log: Submit copy of the daily air sample analytical reports and a copy of Asbestos Abatement Contractor's Daily project log.
2. Personal Air Monitoring Data: Submit copy of personal air monitoring analytical reports and chain of custody.

1.8 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with the referenced standards.

B. Pre-Work Conference: Before the Work of this Section is scheduled to commence, a conference will be held by the Director's Representative at the Site for the purpose of reviewing the Contract Documents, discussing requirements for the Work, and reviewing the Work procedures.

1. The conference shall be attended by the Contractor, the asbestos removal subcontractor, and the testing laboratory employed by the Director.

C. Work Plan: At the conclusion of the pre-work conference, before the physical abatement Work begins, prepare a detailed work plan.

D. The work plan shall include, but not be limited to, work procedures, types of equipment, details of equipment used, decontamination unit locations, crew size, and emergency procedures for fire and medical emergencies and for failure of containment barriers.

E. If a site specific variance is sought, do not finalize the work plan until the Department of Labor decision is received.

1.9 PROJECT CONDITIONS

A. In addition to the postings required by law, post at the entrance to the abatement area the following documents:

1. Copy of the printed Work plan.
2. Copy of Industrial Code Rule 56.

B. Shut-down of Air Handling System: Complete the Work of this Section within the time limitation allowed for shut-down of the air handling system serving the work area.

1. The air handling system will not be restarted until approval of the air monitoring tests following the last cleaning.
2. If total shut down of the system is not acceptable, follow all regulations for local isolation and provision for temporary HVAC as per DOL regulations.

C. Maintain electric services to those portions of the building and remaining facility not a part of the asbestos abatement work area at all times. Follow all regulations for electric power shut down exemptions as per DOL regulations.

D. Do not obstruct any aisle or passageway so as to reduce its required width as an exit.

1.10 HEALTH AND SAFETY

A. Where in the performance of the work, workers, supervisory personnel or sub-contractors may encounter, disturb, or otherwise function in the immediate vicinity of contaminated items and materials, all personnel shall take appropriate continuous measures as necessary to protect all ancillary building occupants from the potential ACM exposure.

1. Such measures shall include the procedures and methods described herein and shall be in compliance with all applicable regulations of Federal, State and Local agencies.

1.11 FIRE PROTECTION, EMERGENCY EGRESS AND SECURITY

A. Establish emergency and fire exits from the work area containment. Provide first aid kits and two full sets of protective clothing and respirators for use by qualified emergency personnel outside of the work area.

B. Provide a logbook throughout the entire term of the project. All persons who enter the regulated abatement work area or enclosure shall sign the logbook. Document any intrusion or incident in the log book.

1.12 PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

A. Workers must wear personal protective equipment for all projects as per OSHA and DOL regulations. Provide respiratory protection in accordance with OSHA regulation 1910.134 and ANSI Z88.2.

B. Workers must be trained as per OSHA and DOL requirements, have medical clearance and must have recently received pulmonary function test (PFT) and respirator fit tested by a trained professional.

1. A personal air sampling program shall be in place as required by OSHA.
2. The use of respirators must also follow a complete respiratory protection program as specified by OSHA.

PART 2 - PRODUCTS

2.1 DISPOSAL BAGS

A. Type: Minimum 6 mil thick, black, and preprinted with a Caution Label.

2.2 EQUIPMENT

A. Temporary lighting, heating, hot water heating units, ground fault interrupters, and all other equipment on site shall be UL listed.

B. All electrical equipment shall be in compliance with the National Electric Code, Article 305 - Temporary Wiring.

2.3 GLOVE BAGS

A. Type: Minimum 6 mil thick, clear, fire retardant polyethylene. Select glove bag sizes appropriate for the size and location of the project.

2.4 NEGATIVE AIR PRESSURE UNITS

A. Type: Local exhaust system, capable of maintaining negative air pressure within the containment, and provides for HEPA filtration of efficiency not less than 99.97 percent with 0.3 micron particles. Equip the unit with filter alarms lights and operation time meter.

2.5 PLASTIC SHEETS

A. Type: Minimum 6 mil thick, clear, fire retardant polyethylene.

2.6 RESPIRATORS

A. Type: As approved by the Mine Safety and Health Administration (MSHA), Department of Labor, or the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

2.7 VACUUM CLEANERS

A. Type: Vacuums equipped with HEPA filters.

PART 3 - EXECUTION

3.1 ASBESTOS-CONTAINING MATERIAL HANDLING AND REMOVAL PROCEDURES

A. Comply with the standards referenced in Part 1 of this Section.

3.2 CLEAN UP PROCEDURES

A. Comply with the standards referenced in Part 1 of this Section.

3.3 PROJECT AIR SAMPLING, MONITORING AND ANALYSIS

A. Air Sampling and Analysis: The Director will employ the services of an independent testing laboratory to perform air sample monitoring. The laboratory shall use the methods described in standards referenced in Part 1 of this Section.

1. The equipment, duration, flow rate, calibration of equipment, number and location of samples are as per ICR 56-4.
2. Air sampling technician shall be on site to observe and maintain air sampling equipment for the duration of the air sampling collection.
3. Period of time permitted between completion of air sample collection and receipt of results on the project site shall be equal or less than 48 hours.

B. If air samples collected outside the regulated work area indicate airborne fiber concentrations at or above 0.01 fibers per cubic centimeter, or the established background level, whichever is

greater, work shall stop immediately for inspection of barriers and negative air ventilation systems. Clean up surfaces outside the regulated work area using HEPA filter equipped vacuums and wet cleaning methods. Work methods shall be altered to reduce fiber concentrations to acceptable levels.

C. Elevated air sample results, if any, along with background and all other air sample results collected during Phase IIA through Phase IIC shall be submitted to the Commissioner of appropriate Asbestos Control Bureau within the same business day of receipt of results.

3.4 FINAL CLEANING AND CLEARANCE PROCEDURES

A. Negative Pressure Ventilation: Negative air pressure machines if used, shall remain in continuous operation during the entire length of the project.

B. Cleaning and Visual Inspection: After first, second, third cleaning and required waiting/settling and drying periods, perform a final visual inspection.

1. Final clearance air sampling shall commence after the waiting/settling and drying time as per ICR 56 has elapsed.

C. Project Monitor Visual Inspection: The Director will employ the services of a DOL certified asbestos project monitor employed by an independent testing laboratory to perform visual inspection as required by ICR 56.

D. Final Clearance Air Sampling: The Director will employ the services of an independent testing laboratory to perform final air sampling.

1. The laboratory shall use the methods described in standards referenced in Part 1 of this Section.
2. The equipment, duration, flow rate, calibration of equipment, number and location of samples are as per ICR 56-4.
3. If initial Post-Abatement (Clearance Air) Monitoring results do not comply with the standards referenced in Part 1 of this Section the Contractor shall either re-clean or order a full set of TEM analysis.

    a. Results of the TEM analysis will be conclusive, and if the results do not comply with the standards referenced in Part 1 of this Section, the Contractor shall re-clean and additional full set of air samples will be collected and analyzed until the standards are met.
    b. All satisfactory PCM clearance air sample results along with background air sample results, if they are greater than or equal to 0.01 fibers per cubic centimeter, shall be submitted to the Commissioner of appropriate Asbestos Control Bureau within two business days of receipt of satisfactory clearance air results.
    c. All satisfactory TEM results of previously unsatisfactory PCM clearance air sample results, along with the unsatisfactory PCM results shall be submitted to the Commissioner of appropriate Asbestos Control Bureau within two business days of receipt of satisfactory clearance air results.

4. Prior to removal of isolation barriers the Director's Representative at the site will receive an affidavit from the air monitoring laboratory certifying the final air samples comply with the standards referenced in Part 1 of this Section.

E. Dismantling of Regulated Abatement Work Area:

1. Remove all tools and equipment after proper decontamination as per Part 1 of this section.
2. Dismantle and remove each tent enclosure and air lock and any barriers only after final clearance air monitoring has been performed and satisfactory results obtained.
3. All remaining polyethylene, duct tape, expandable foam and other barrier materials shall be bagged, wrapped, containerized and labeled as asbestos waste.
4. Remove all temporary hard walled barriers from site.
5. Dismantle any remote decontamination units and plastic sheeting shall be disposed as asbestos waste.
6. Remove all waste generated to the holding area, lockable trailer or dumpster.
7. Contractor's Supervisor shall certify in writing to the Director that abatement work is complete and no debris/residue remains.

3.5 DISPOSAL OF ASBESTOS-CONTAINING MATERIAL AND RELATED DEBRIS

A. Remove all waste generated as part of the asbestos project from the project site within ten calendar days from the site after completion of Phase IIC of the project or within one day of the waste disposal container/trailer becomes full, whichever occurs first.

B. Transport and dispose of all the asbestos-containing waste, related debris, and waste water to the approved disposal site.

C. All generated waste removed from the site must be documented, accounted for and disposed of in compliance with the requirements of USEPA NESHAP.

D. Comply also with the standards referenced in Part 1 of this Section.

3.6 RESTORATION

E. Remove temporary decontamination facilities and restore area designated for these facilities to its original condition or better.

F. Where existing work is damaged or contaminated, restore work to its original condition or better.

END OF SECTION

SECTION 02 83 04

HANDLING OF LEAD CONTAINING MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies the requirements for the detection and prevention of lead dust, paint chips, or debris contamination of lead dust control work areas and areas adjacent to them, protection of workers, post-work cleaning, predisposal testing and appropriate disposal of removed material. The results of the testing for lead-containing materials are listed in the appendix.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Existing Hazardous Material Information: Section 00 03 00.

B. Summary of the Work: Section 01 10 00.

C. Temporary Facilities and Controls: Section 01 50 00.

1.3 REFERENCES

A. New York State Department of Environmental Conservation (DEC) 6NYCRR:

1. Part 360 Solid Waste Management Facilities.
2. Part 364 Waste Transporter Permits.
3. Part 370 Hazardous Waste Management System-General.
4. Part 371 Identification and Listing of Hazardous Wastes.
5. Part 372 Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities.
6. Part 373 Hazardous Waste Management Facilities.

B. New York State Department of Transportation (DOT): Follow all regulations of 49CFR Part 100 through 199.

C. Occupational Safety and Health Administration (OSHA): Lead Exposure in Construction: Interim Final Rule 29 CFR 1926.62.

D. U.S. Department of Housing and Urban Development (HUD): Guidelines for evaluation and control of Lead based paint hazards: Title Ten of Housing and Community Act of 1992.

E. U.S. Environmental Protection Agency (EPA): Resource Conservation and Recovery Act (RCRA) Section 3004 Hazardous and Solid Waste Amendments.

F. U.S. Environmental Protection Agency (EPA): Toxicity Characteristics Leaching Procedure EPA Method 1311.

1.4 DEFINITIONS

A. Authorized Personnel: Facility or the Owner's Representative, and all other personnel who are authorized officials of any regulating agency, be it State, Local, Federal or Private entity who possess legal authority for enforcement or inspection of the work.

B. Containment: The enclosure within the building which establishes a contaminated area and surrounds the location where lead remediation is taking place and establishes a Lead Control Work Area.

C. Floor Surface Clearance Criteria: Shall be determined and established by an independent testing lab hired by the Owner's Representative, conforming to all standards set forth by all authorities having jurisdiction, mentioned in the references, and issue the certification of cleaning. At a minimum no single post work lead wipe sample test values shall have reading levels greater than the levels established by pre-work wipe sampling test values, or greater than 10 mg/ft^2. Record levels in mg/ft^2.

D. Fixed Object: Mechanical equipment, electrical equipment, fire detection systems, alarms, and all other fixed equipment, furniture, fixtures or other items which cannot be removed from the work area.

E. HEPA: High Efficiency Particulate Absolute filtration efficiency of 99.97 percent down to 0.3 microns. Filtration provided on specialized vacuums and air filtration devices to trap particles.

F. Lead Based Paint (LBP): Paints or other surface coatings that contain lead equal to or greater than 1.0 milligrams per square centimeter or 0.5 percent of lead by weight.

G. Lead Dust Control Work Area: A cordoned off area with drop clothes or an enclosed area or structure with containment to prevent the spread of lead dust, paint chips, or debris from lead-containing paint disturbance operations.

H. PPE: Personal Protective Equipment.

1.5 ABBREVIATIONS

A. ASTM: American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

B. CFR: Code of Federal Regulations
Government Printing Office
Washington, DC 20402

C. DOT: Department of Transportation
Main Office, 50 Wolf Road
Albany, NY 12232

D. NIOSH: National Institute for Occupational Safety and Health

Building J, N.E. Room 3007

Atlanta, Georgia 30333

E. OSHA: Occupational Safety and Health Administration

200 Constitution Avenue

Washington, DC 20210

F. USEPA: United States Environmental Protection Agency

401 M Street SW

Washington, DC 20460

1.6 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer's installation instructions shall be provided along with product data.

C. Submittals shall be provided individually in the order in which they are specified and tabbed.

D. Quality Control Submittals: Submit the entire Lead Abatement submittal package at the same time.

1. Worker' Qualifications: The persons removing lead containing/coated material and their Supervisors shall be personally experienced in this type of work and shall have been employed by a company with a minimum of one year experience in this type of work. Submit a copy of documentation of completion of the EPA lead renovators training program.

   a. Name of lead supervisor on site during the work.

2. Detailed Work Plan: Submit one copy of the work plan required under Quality Assurance Article.
3. Waste Transporter Permit: One copy of transporter's current NYS DEC waste transporter permit.

E. Operation and Maintenance Data: Submit air filtration unit operation and maintenance data and manufacturer's catalog sheets for the HEPA filter.

1. Provide an affidavit stating that the HEPA filters to be used for this project are new and unused.

F. Contract Closeout Submittals:

1. Assessment Report compiled by a testing lab certifying that the work area has lead concentrations below the levels specified under the cleaning criteria.
2. Disposal Site Receipts: Copy of waste shipment record and disposal site receipt showing that the lead-containing materials have been properly disposed.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with the referenced standards.

B. Pre-Work Conference: Before the Work of this Section is scheduled to commence, a conference will be held by the Owner's Representative at the Site with the contractor and the lead handling subcontractor (if any) for the purpose of reviewing the Contract Documents, discussing requirements for the Work, and reviewing the Work procedures.

C. Detailed Lead-Containing Material Removal Work Plan: Before the physical Work begins, prepare a detailed lead-containing material removal work plan.

1. The work plan shall include, but not be limited to, the location, size, and details of lead dust control work areas, containment, sequencing of lead containing material handling, work procedures, types of equipment, crew size, and emergency procedures for fire and medical emergencies.

1.8 PROJECT CONDITIONS

A. Shut-down of Air Handling System: Complete the Work of this Section within the time limitation allowed for shutdown of the air handling system serving the work area.

1. The air handling system will not be restarted until approval of the post-work dust-wipe testing following the last cleaning.

B. Cover and seal all fin-tube radiator covers, diffusers, duplex outlets, speakers, smoke and heat detectors, etc. Use temporary plasticized partitions as required.

1. Prevent lead containing dust from entering hard to clean areas within the dust containment area.
2. Items judged to be too difficult to protect may be disconnected, removed and replaced at contractor's option.

C. Remove or encase all movable equipment in the work area with two layers of six mil fire retardant polyethylene sheeting.

D. Cut and alter existing materials as required to perform the work. Limit cutting to the smallest amount necessary. Core drill round holes and saw cut other openings where possible for removal work. Flame cutting, high speed grinding or welding is prohibited on lead painted surfaces.

1.9 HEALTH AND SAFETY

A. Where in the performance of the work, workers, supervisory personnel or sub-contractors may encounter, disturb, or otherwise function in the immediate vicinity of contaminated items and materials, all personnel shall take appropriate continuous measures as necessary to protect all ancillary building occupants from the potential lead exposure.

1. Such measures shall include the procedures and methods described herein and shall be in compliance with all applicable regulations of Federal, State and Local agencies.

1.10 FIRE PROTECTION, EMERGENCY EGRESS AND SECURITY

A. Establish emergency and fire exits from the lead dust control work area containment. Provide first aid kits and two full sets of protective clothing and respirators for use by qualified emergency personnel outside of the work area.

B. Provide a logbook throughout the entire term of the project. All persons who enter the regulated lead dust control work area or containment shall sign the logbook. Document any intrusion or incident in the log book.

1.11 PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT

A. Workers must wear protective suits, protective gloves, eye protection and a minimum of half-face respirator with new HEPA filter cartridge for all projects. Respiratory protection shall be in accordance with OSHA regulation 1910.134 and ANSI Z88.2.

B. Workers must be trained per EPA, have medical clearance and must have recently received pulmonary function test (PFT) and respirator fit tested by a trained professional.

1. A personal air sampling program shall be in place as required by OSHA.
2. The use of respirators must also follow a complete respiratory protection program as specified by OSHA.

PART 2 - PRODUCTS

2.1 RESPIRATORS

A. Type: Approved by the Mine Safety and Health Administration (MSHA), Department of Labor, or the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services.

2.2 VACUUM CLEANERS

A. Type: Vacuums equipped with new HEPA filters.

2.3 PLASTIC SHEETS

A. Type: Minimum 6 mil., clear, fire retardant polyethylene sheets.

B. Floor Protective Layer: Minimum 10 mil., reinforced polyethylene sheets.

2.4 DISPOSAL BAGS

A. Type: Minimum 6 mil thick, clear polyethylene bags with preprinted Caution Label. Properly containerize/drum prior to disposal.

2.5 EQUIPMENT

A. Temporary lighting, heating, hot water heating units, ground fault interrupters, and all other equipment on site shall be UL listed and shall be safe, proper, and sufficient for the purpose intended.

B. All electrical equipment shall be in compliance with the National Electric Code, Article 305 - Temporary Wiring.

PART 3 - EXECUTION

3.1 PRE-WORK WIPE TESTING

A. Testing: The Owner's Representative will employ the services of an independent testing laboratory to perform the pre-work testing within the lead dust control work area and the areas adjacent to the lead dust control work area.

1. The testing lab will be New York State Department of Health, Environmental Laboratory Accreditation Program (NYS ELAP).

3.2 EMPLOYEE PROTECTION

A. Comply with all applicable Occupational Safety and Health Administration (OSHA) Requirements.

3.3 LEAD-CONTAINING/COATED MATERIAL HANDLING AND DISPOSAL

A. Handle and dispose of lead-containing materials in accordance with OSHA 1926.62 and the approved lead-containing material work plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when material containing or coated with lead containing paint is handled and disposed of in accordance with referenced standards.

3.4 POST-WORK WIPE TESTING

A. Testing: The Owner will employ the services of an independent testing laboratory to perform the post-work testing within the lead dust control work area and the areas adjacent to the lead dust control work area as applicable by local and federal regulations.

1. The testing lab will be New York State Department of Health, Environmental Laboratory Accreditation Program (NYS ELAP).

3.5 MULTIPLE WORK LOCATIONS

A. The first two work locations encountered shall be utilized to develop a method for an acceptable baseline approach for the lead dust control area, pre work wipe samples, employee protection, work method, post work wipe samples, cleaning criteria and disposal.

1. Once an acceptable method is developed and verified by the independent testing lab employed by the Owner, subsequent testing shall not be required.

2. Do not change the methodology of the verified work plan during the course of the entire project.

3.6 CLEANING CRITERIA

A. Cleaning criteria is separated into two categories; areas within the lead dust control work area, and areas adjacent to the lead dust control work area:

1. Surfaces within the Lead Dust Control Work Area: In each area where the lead containing/coated materials have been disturbed, compare the post work wipe sample values with the pre work wipe sample values. If any of the sample values exceed the pre work values, clean again and schedule retesting until the lead levels are equal to or less than the pre work values or less than the HUD guidelines listed below. Any other surfaces inside the lead dust control work area that are not listed below shall be cleaned to the pre work values:

   a. Floors: 10 micrograms of lead per square foot.
   b. Window Sills: 100 micrograms of lead per square foot.
   c. Window Troughs: 400 micrograms of lead per square foot.
   d. Soil: 400 ppm in play areas and 1,200 ppm in bare soil in the remainder of the yard.

2. Areas Adjacent to the Lead Dust Control Work Area: In each area where the work has been performed, compare the post work wipe sample values with the pre work wipe sample values. If any of the sample values exceed the pre work values, the area has been contaminated by the work and cleaning is mandatory.

   a. Clean all affected surfaces and schedule retesting. If results still exceed pre work wipe sample values, clean again and schedule retesting until the following criteria is met or until the lead dust values are equal to or lower than the pre-work wipe sample values. Any affected surfaces that are not listed below shall be cleaned to pre-work levels.

      1) Floors: 10 micrograms of lead per square foot.
      2) Window Sills: 100 micrograms of lead per square foot.
      3) Window Troughs: 400 micrograms of lead per square foot.
      4) Soil: 400 ppm in play areas and 1,200 ppm in bare soil in the remainder of the yard.

3.7 CERTIFICATION OF CLEANING

A. Schedule visual inspection and dust wipe testing with the Owner's Representative at the site, when work area is ready for clearance testing.

B. Owner's Representative will employ the services of an independent testing lab to perform clearance testing.

1. Prior to removal of any isolation barrier, the Owner's Representative will obtain a written affidavit and a final assessment report from the lab stating that the tests conform to all standards set forth by all authorities having jurisdiction, mentioned in the references.

2. Schedule a walk-through inspection with the Owner's Representative and obtain his written approval.

C. The Owner's Representative shall have final determination of an acceptable clearance level.

3.8 PRE-DISPOSAL TESTING

A. Prior to disposal, the Owner's Representative will employ the services of an independent testing lab to perform clearance testing of the removed materials for toxicity in accordance with EPA Method 1311, Toxicity Characteristic Leaching Procedure (TCLP).

1. Test results indicating a value greater than 5 ppm lead or 5mg/L classifies the removed material as Hazardous Waste.

3.9 DISPOSAL OF LEAD-CONTAINING/COATED MATERIAL AND RELATED DEBRIS

A. Transport and dispose of lead-containing material classified as Hazardous Waste in accordance with the standards referenced in Part 1 of this Section.

B. Transport and dispose of lead-containing material classified as Non- Hazardous Waste in accordance with the standards referenced in Part 1 of this Section.

3.10 RESTORATION

A. Remove temporary decontamination facilities and restore area designated for these facilities to its original condition or better.

B. Where existing construction is damaged or contaminated during the course of performing this project, restore area to its condition or better.

END OF SECTION

ITEM 627.0003 25 **CONCRETE**

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

1.03 Provide all labor, materials, and equipment necessary to repair miscellaneous areas of concrete spalling as directed by the Engineer. Repairs shall include removal of deteriorated concrete, surface preparation, treatment of reinforcement, and placement of approved repair materials in accordance with project specifications.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

ITEM 627.0003 25 **CONCRETE**

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 03 30 00 – CAST-IN-PLACE CONCRETE
B. Section 03 60 00 – GROUTING

6.02 This item shall include, but not be limited to, the following:

A. Filling the existing hatch in the control building basement to the wet well

B. Repair of isolated areas of concrete spalling around the upper wet well as indicated on contract drawings. Work under this item generally includes:

i. Field identification and marking of spalled or delaminated concrete areas as directed by the Engineer

ii. Removal of unsound concrete by mechanical means (e.g., chipping, grinding, or hydro-demolition) to expose sound substrate

iii. Cleaning and surface preparation, including removal of debris, dust, and contaminants

iv. Treatment of exposed reinforcement, including cleaning and application of corrosion protection where required

v. Application of bonding agents as needed

vi. Placement of repair materials, such as cementitious repair mortar or polymer-modified concrete, compatible with the existing structure

vii. Finishing and curing of repaired surfaces to match adjacent conditions

C. Grouting associated with Item 627.0005 25.

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Formwork for cast-in-place concrete.
2. Reinforcing bars.
3. Welded wire fabric.
4. Reinforcement accessories.
5. Cast-in-Place Concrete

1.3 REFERENCE STANDARDS

A. American Concrete Institute
1. ACI 211 – Guide for Selecting Proportions for Concrete.
2. ACI 301 – Specifications for Structural Concrete.
3. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
4. ACI 305 – Guide to Hot Weather Concreting.
5. ACI 306 – Guide to Cold Weather Concreting.
6. ACI 308 – Guide for External Curing of Concrete.
7. ACI 309 – Guide for Consolidation of Concrete.
8. ACI 318 – Code Requirements for Reinforced Concrete.
9. ACI 347 – Guide to Formwork Concrete.
10. ACI 350 – Code Requirements for Environmental Engineering (Water & Wastewater) Concrete Structures.

B. ASTM
1. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
3. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
4. ASTM C33 - Standard Specification for Concrete Aggregates.
5. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
6. ASTM C150 - Standard Specification for Portland Cement.
7. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

1.4 SUBMITTALS

A. Concrete-Mix designs.

B. Reinforcing steel.

C. Concrete placement drawings.

D. Curing compounds and methods.

1.5 TESTING

A. Perform and submit materials testing to demonstrate conformance with the specifications.

B. Samples and tests shall be performed in accordance with ASTM standards.

PART 2 – PRODUCTS

2.1 FORMS

A. Forms for Exposed Finish Concrete: Unless otherwise specified or shown on the drawings, construct formwork for exposed concrete surfaces with plywood, or other panel type materials in order to provide exposed surfaces that are continuous, straight, and smooth. Furnish panels in the largest practicable sizes. Provide form material that is thick enough to withstand pressure of newly placed concrete without bowing or deflection.

B. Forms for Unexposed Finish Concrete: For surfaces that will be unexposed in the finished structure, for concrete with plywood, lumber, metal, or other acceptable material. If lumber is used, it shall be dressed on at least two edges and one side for a tight fit.

2.2 FORM COATINGS

A. Provide commercial formulation form coating compounds that will not bond with, stain, or adversely affect the concrete surface and that will not impair subsequent treatments of concrete surfaces to be cured with water or curing compound.

2.3 REINFORCEMENT

A. Reinforcing bars shall be Grade 60 and in accordance with ASTM A615.

B. Welded plain and deformed steel wire fabric shall be in accordance with ASTM A1064.

C. Provide supports for reinforcement, including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Unless otherwise indicated on the drawings, use wire type bar supports. Wood and other materials will not be accepted as bar supports.

2.4 CONCRETE MATERIALS

A. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

B. Cast-in-place concrete shall be:
   1. NYSDOT Structural PEM 555 - 4,000 psi mix design unless otherwise noted.

C. Minimum Requirements:
   1. Portland Cement: ASTM C150, Type I or II, low-alkali.
   2. Aggregate, general:
      a. ASTM C33, uniformly graded and clean.
      b. Do not use aggregate known to cause excessive shrinkage.
   3. Aggregate, Coarse: Maximum 3/4-inch crushed rock or washed gravel.

2.5 ACCESSORIES AND OTHER MATERIALS

A. Curing Materials: Contractor selected method and materials shall be in conformance with the requirements of ACI 301.

B. Provide other materials, not specifically described but required for a complete and proper installation as selected by the Contractor

PART 3 – EXECUTION

3.1 REPAIR OF DETERIORATED CONCRETE

A. Concrete repairs shall be conducted using Sauereisen's F 121/210 system with SewerGard No 210XHB. Repairs over 1" require anchors, wire mesh or rebar.

B. All loose, broken, softened, and acid contaminated concrete shall be removed by sandblasting and chipping down to sound, uncontaminated concrete.

C. When the removal of deteriorated concrete is completed, the CONTRACTOR shall notify the OWNER. Two weeks shall be scheduled for the OWNER to inspect the surface, perform testing for acid contamination, determine if additional concrete must be removed, and to develop any special repair details that may be needed. Should it be determined that additional concrete must be removed to reach sound, uncontaminated material, another 2-week period shall be scheduled for further evaluation after the end of the additional removal.

D. Additional surface preparation shall follow the recommendations of the repair mortar manufacturer.

E. Isolated areas of exposed reinforcing bars shall be treated as required for repair of surface defects specified herein. If extensive areas of reinforcement are uncovered after removal of deteriorated concrete, repair methods shall be as determined by the OWNER

3.2 FORMWORK

A. Design, erect, support, brace, and maintain formwork to support any vertical and lateral loads that may be applied until such loads can be supported by the concrete structure.

Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position.

B. Construct forms complying with ACI 347 to the sizes, shapes, lines, and dimensions shown on the Construction Drawings so that in the finished structures the work will be level and plumb and have accurate alignment, location, and grade. Provide for openings, offsets, sinkage, keyways, recesses, moldings, rustication, reglets, chambers, blocking, screeds, bulkheads, anchorages, inserts, wall pipes, and other features that the work requires. Use selected materials to obtain the required finishes. But joints solidly, and provide backup at joint to prevent leakage of cement paste.

C. Fabricate forms so that they can be easily removed without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where the slope is too steep for the concrete to be placed with the bottom forms only. To form keyways, reglets, recesses, and the like, kerf wood inserts to prevent swelling and to permit easy removal.

D. Clean thoroughly forms and adjacent surfaces that are to receive concrete. Remove chips, wood, sawdust, dirt, and any other debris just before the concrete is placed. After concrete placement, retighten the forms as necessary to eliminate mortar leaks.

3.3 EARTH FORMS

A. Trench earth forms neatly, accurately, and at least 2 inches wider than footing widths indicated on the Drawings.

B. Construct wood edge strips at the top of each side of the trench to secure reinforcing and to prevent trench from sloughing.

C. Tamp earth forms firm and clear them of debris and loose material before depositing concrete.

3.4 REINFORCEMENT

A. Reinforcement shall be free of loose rust and mill scale, earth, ice, and other materials that reduce or destroy the bond with concrete.

B. Place reinforcement to obtain at least the minimum coverage for concrete protection as required by ACI 318. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so that ends are directed into the concrete, not toward exposed concrete surfaces.

3.5 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast in.

B. Mix concrete in accordance with ASTM C94.

C. Place concrete in accordance with ACI 304.

D. Deposit concrete either continuously or in layers thick enough to prevent its being placed on concrete that has hardened enough to cause the formation of seams or planes of weakness withing the section. Deposit concrete as close to its final location as practicable in order to avoid segregation due to rehandling or flowing.

E. Deposit concrete in forms in horizontal layers no deeper than 24 inches. Avoid cold joints by placing each layer while the preceding one is still plastic.

F. Use mechanical vibrating equipment supplemented by hand spading, ridding, or tamping to consolidate placed concrete. The equipment and procedures used to consolidate the concrete shall comply with the recommended practices of ACI 309 and suit bot the type of concrete and project conditions. Provide standby mechanical vibrating equipment at all concrete placements.

G. Consolidate concrete during placing operations so that it is thoroughly worked around reinforcement and other embedded items and into corners.

H. Maintain reinforcement in the proper position during placement operations.

3.6 COLD WEATHER PLACEMENT

A. Comply with ACI 306 and the requirements herein specified to protect concrete work from physical damage or reduced strength due to frost, freezing, or low temperatures.

B. When the air temperature has fallen or is expected to fall below 40° F, heat all water and aggregates uniformly before mixing so that the concrete, at point of placement, will have a temperature of not less than 50° F nor more than 80° F.

C. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade containing frozen subgrade or on subgrade containing frozen materials.

D. Accelerators and additives shall be approved during the submittal process

3.7 HOT WEATHER PLACEMENT

A. When the weather is hot enough to impair seriously the concrete's quality and strength, place the concrete as specified herein and in ACI 305.

B. Cool ingredients before mixing so that when the concrete is placed, its temperature is below 90°
F. Mixing water may be chilled, or else a portion of the water may be in the form of chopped ice.

C. If reinforcing steel becomes hotter than the ambient air temperature, cool it with water-soaked burlap so that its temperature will not exceed the ambient air temperature.

3.8 CONCRETE FINISHING

A. Unless otherwise indicated, provide the following finishes:
   1. Trowel Finish: Apply to monolithic slab surfaces that are to be exposed to view, unless otherwise shown.

END OF SECTION 03 30 00

SECTION 03 60 00

GROUTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Portland cement grout.
   2. Rapid-curing epoxy grout.
   3. Nonshrink cementitious grout.

B. Related Requirements:
   1. Section 03 30 00 – Cast-in-Place Concrete
   2. Section 05 52 15 – Aluminum Handrails and Railings

1.2 REFERENCE STANDARDS

A. American Concrete Institute:
   1. ACI 301 - Specifications for Structural Concrete for Buildings.
   2. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:
   1. ASTM C33 - Standard Specification for Concrete Aggregates.
   2. ASTM C40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
   3. ASTM C150 - Standard Specification for Portland Cement.
   4. ASTM C191 - Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle.
   5. ASTM C307 - Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacings.
   6. ASTM C531 - Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
   7. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
   8. ASTM C827 - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.

C. U. S. Army Corps of Engineers Concrete Research Division (CRD):
   1. CRD-C621 - Non-Shrink Grout.

1.3 SUBMITTALS

A. Submittals for this section are subject to the requirements identified in Section 01 33 00 – Submittal Procedures.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product Data: Submit manufacturer information regarding grout

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Include separate Paragraphs for additional certifications.

G. Manufacturer Instructions: Submit instructions for mixing, handling, surface preparation, and placing epoxy-type and nonshrink grouts.

H. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

I. Qualifications Statement:
   1. Submit qualifications for manufacturer.

1.4 QUALITY ASSURANCE

A. Perform Work according to ASTM C531 standards.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:
   1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
   2. Provide additional protection according to manufacturer instructions.

1.7 AMBIENT CONDITIONS

A. Maximum Conditions: Do not perform grouting if temperatures exceed manufacturer recommended conditions.

B. Minimum Conditions: Maintain minimum temperature of manufacturer recommended conditions before, during, and after grouting, until grout has set.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT GROUT

A. Portland Cement: Comply with ASTM C150, Type I and II.

B. Water:
1. Potable.
2. No impurities, suspended particles, algae, or dissolved natural salts in quantities capable of causing:
    a. Corrosion of steel.
    b. Volume change increasing shrinkage cracking.
    c. Efflorescence.
    d. Excess air entraining.

C. Fine Aggregate:
1. Washed natural sand.
2. Gradation:
    a. Comply with ASTM C33.
    b. Represented by smooth granulometric curve within required limits.
3. Free from injurious amounts of organic impurities according to ASTM C40.

D. Mix:
1. Portland cement, sand, and water.
2. Do not use ferrous aggregate or staining ingredients in grout mixes.

2.2 RAPID-CURING EPOXY GROUT

A. Manufacturers:
1. ARDEX Americas.
2. Euclid Chemical Company.
3. Sika Corporation.
4. Approved equivalent.

B. Description:
1. High-strength, three-component epoxy grout formulated with thermosetting resins and inert fillers.
2. Rapid-curing, high adhesion, and resistant to ordinary chemicals, acids, and alkalis.

C. Performance and Design Criteria:
1. Compressive Strength:
    a. 12,000 psi at seven days.
    b. Comply with ASTM C579.
2. Minimum Tensile Strength:
    a. 2,000 psi.
    b. Comply with ASTM C307.
3. Coefficient of Expansion:
    a. 30x10-6 inch per degree F.
    b. Comply with ASTM C531.

4. Shrinkage:
    a. None.
    b. Comply with ASTM C827.

2.3 NONSHRINK CEMENTITIOUS GROUT

A. Manufacturers:
1. ARDEX Americas.
2. Euclid Chemical Company.
3. Sika Corporation.
4. Approved equivalent.
5. Furnish materials according to ACI & ASTM standards.

B. Description:
1. Pre-mixed and ready-for-use formulation requiring only addition of water.
2. Nonshrink, non-corrosive, nonmetallic, non-gas forming, and no chlorides.

C. Performance and Design Criteria:
1. Certified to maintain initial placement volume or expand after set, and to meet following minimum properties when tested according to CRD-C621 for Type D nonshrink grout:
    a. Setting Time:
        1) Initial: Approximately two hours.
        2) Final: Approximately three hours.
        3) Comply with ASTM C191.
    b. Maximum Expansion: 0.10 to 0.40 percent.
    c. Compressive Strength:
        1) One-Day: 4,000 psi.
        2) Seven-Day: 7,000 psi.
        3) 28-Day: 10,000 to 10,800 psi.
        4) Comply with CRD-C621.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify areas to receive grout.

3.2 PREPARATION

A. Remove defective concrete, laitance, dirt, oil, grease, and other foreign material from concrete surfaces by brushing, hammering, chipping, or other similar means until sound and clean concrete surface is achieved.

B. Roughen concrete lightly, but not to interfere with placement of grout.

C. Remove foreign materials from metal surfaces in contact with grout.

D. Align, level, and maintain final positioning of components to be grouted.

E. Saturate concrete surfaces with clean water and then remove excess water.

3.3 INSTALLATION

A. Formwork:
1. Construct leakproof forms anchored and shored to withstand grout pressures.
2. Install formwork with clearances to permit proper placement of grout.
3. As specified in Section 03 30 00 – Cast-In-Place Concrete.

B. Mixing:
1. Portland Cement Grout:
   a. Use proportions of two parts sand and one part cement, measured by volume.
   b. Prepare grout with water to obtain consistency to permit placing and packing.
   c. Mix water and grout in two steps:
      1) Premix using approximately 2/3 of water.
      2) After partial mixing, add remaining water to bring mix to desired placement consistency and continue mixing two to three minutes.
   d. Mix only quantities of grout capable of being placed within 30 minutes after mixing.
   e. Do not add additional water after grout has been mixed.
   f. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.
2. Rapid-Curing Epoxy Grout:
   a. Mix and prepare according to manufacturer instructions.
   b. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.
3. Nonshrink Cementitious Grout:
   a. Mix and prepare according to manufacturer instructions.
   b. Minimum Compressive Strength: 2,400 psi in 48 hours and 7,000 psi in 28 days.
4. Mix grout components in proximity to Work area and transport mixture quickly and in manner not permitting segregation of materials.

C. Placing of Grout:
1. Place grout material quickly and continuously.
2. Do not use pneumatic-pressure or dry-packing methods.
3. Apply grout from one side only to avoid entrapping air.
4. Do not vibrate placed grout mixture or permit placement if area is being vibrated by nearby equipment.
5. Thoroughly compact final installation and eliminate air pockets.
6. Do not remove leveling shims for at least 48 hours after grout has been placed.

D. Curing:
1. Prevent rapid loss of water from grout during first 48 hours by use of approved membrane curing compound or by using wet burlap method.
2. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury.
3. After grout has attained its initial set, keep damp for minimum three days.

3.4 FIELD QUALITY CONTROL

A. Inspection and Testing:

1. Comply with ACI 301
2. Submit proposed mix design of each class of grout to Owner for review prior to commencement of Work.
3. Tests of grout components may be performed to ensure compliance with specified requirements.

END OF SECTION 03 60 00

ITEM 627.0005 25 **METALS**

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0005 25 **METALS**

1. SPECIFICATION SUMMARY

1.01 This Item includes the following specifications:

A. Section 05 51 17 – ALUMINUM STAIRS
B. Section 05 52 15 – ALUMINUM HANDRAILS AND RAILINGS

1.02 This item shall include, but not be limited to, the following:

A. The work includes furnishing and installing trickling filter platform, stairs, railings and required footers.

B. Providing engineered components that meet specified structural loads along with shop drawings, testing data, and manufacturer certifications.

C. Installation includes proper handling, anchorage, sealing, and alignment of all components in accordance with approved drawings and manufacturer requirements, with a one-year material and workmanship warranty

D. Shop drawings and calculations stamped by a New York State Professional Engineer.

E. Manufacturer's field inspection with written report.

SECTION 05 51 17

ALUMINUM STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to design, furnish and install aluminum stairs.
   2. The extent of aluminum stairs shall be as shown.
   3. The Work also includes:
      a. Providing openings in and attachments to aluminum stairs to accommodate the Work under this and other Sections and providing for the aluminum stairs all items such as anchor bolts, studs and all items required for which provision is not specifically included under other Sections.

B. Coordination:
   1. Review installation procedures under this and other Sections and coordinate the installation of items that must be installed with, or before the aluminum stairs Work.
   2. Notify other contractors in advance of the installation of the aluminum stairs to provide them with sufficient time for the installation of items included in their contracts that must be installed with, or before, the aluminum stairs Work.

C. Related Sections:
   1. Section 05 52 15, Aluminum Handrails and Railings.

1.2 REFERENCES

A. Standards referenced in this Section are listed below:
   1. Aluminum Association (AA), Specification for Aluminum Structures.
   2. American Society for Testing and Materials, (ASTM).
      a. ASTM B 209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
      b. ASTM B 211, Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.
      c. ASTM B 221, Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
      d. ASTM B 308/B 308M, Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
      e. ASTM B 429, Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
      f. ASTM F 593, Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
      g. ASTM F 594, Specification for Stainless Steel Nuts.
   3. American Welding Society, (AWS).
      a. AWS D1.2/D1.2M, Structural Welding Code-Aluminum.
   4. National Association of Architectural Metal Manufacturers, (NAAMM).
      a. NAAMM, Metal Stairs Manual and Metal Finishes Manual.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Manufacturer shall have a minimum of five years experience producing substantially similar equipment and shall be able to show evidence of at least five installations in satisfactory operation for at least five years.

B. Component Supply and Compatibility:
   1. Obtain all products included in this Section regardless of the component manufacturer from a single pre-engineered aluminum stair manufacturer.
   2. The pre-engineered aluminum stair manufacturer to review and approve or to prepare all Shop Drawings and other submittals for all components furnished under this Section.
   3. All components shall be specifically constructed for the specified service conditions and shall be integrated into the overall assembly by the pre- engineered aluminum stair manufacturer.

C. Codes: Comply with the applicable requirements of the state and local building codes.

D. Source Quality Control: CONTRACTOR shall be responsible for entire design, fabrication, and installation of pre-engineered aluminum stair Work.

E. The Shop Drawings and calculations shall be prepared by a Registered Professional Engineer licensed in the State in which the pre-engineered aluminum stairs will be installed and is a recognized expert in the type of Work shown and specified.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:
   1. Product Data:
      a. Manufacturer's literature describing roof system components and materials.

   2. Shop Drawings:
      a. Erection and detailed Shop Drawings, which show the plan location, elevation and details for the fabrication and erection of the aluminum stair Work. Show anchorage and accessory items. Include details of all connections between all materials.

   3. Engineering Submittals:
      a. Provide signed and sealed Shop Drawings and calculations, which are prepared by a Registered Professional Engineer licensed in the State in which the aluminum stairs will be installed.
   4. Samples:
      a. Nosing and tread samples

1.5 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading:

1. Deliver materials to the Site to ensure uninterrupted progress of the Work. Deliver anchor bolts and anchorage devices which are to be embedded in cast- in-place concrete in ample time to prevent delay of that Work.

B. Storage and Protection:
1. Store materials to permit easy access for inspection and identification. Keep all material off the ground, using pallets, platforms, or other supports. Protect materials from corrosion and deterioration.

C. Acceptance at Site:
1. All boxes, crates and packages shall be inspected by CONTRACTOR upon delivery to the Site. CONTRACTOR shall notify ENGINEER, in writing, if any loss or damage exists to equipment or components. Replace loss and repair damage to new condition in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

A. Pre-engineered aluminum stairs shall comply with the requirements of the NAAMM, "Metal Stairs Manual".

B. Sizes of miscellaneous items such as carrier angles and platform stiffeners, and design stresses shall be as recommended in Section 4 of the "Metal Stairs Manual", unless otherwise shown.

C. All required stair loadings and other stair related requirements shall comply with the governing building code in which the pre-engineered aluminum stairs will be installed.

2.2 FABRICATION

A. General:
1. Use welding for joining pieces together, unless otherwise shown or specified. Welding to comply with the applicable provisions of AWS D1.2/D1.2M. Fabricate units so that bolts and other fastenings do not appear on finish surfaces. Make joints true and tight and make connections between parts light-proof tight. Provide continuous welds, ground smooth where exposed.
2. Construct stair units to conform to sizes and arrangements as shown. Provide pre-engineered aluminum framing, hangers, columns, struts, clips, brackets, bearing plates and other components for the support of pre-engineered aluminum stairs and platforms. Erect pre-engineered aluminum stair Workto line, plumb, square, and true with runs registering level with floor and platform levels.
3. Provide brackets and bearing surfaces as detailed and as required to anchor and contain the pre-engineered aluminum stairs on the supporting structure.
4. Where masonry walls support the aluminum stair Work, provide temporary supporting struts, designed for the erection of stair components before installation of masonry.
5. Finish: Provide Architectural mill finish as specified in the NAAMM Manual.
6. Protection of Aluminum from Dissimilar Materials: Coat all surfaces of aluminum in

contact with dissimilar materials, such as concrete, masonry and steel as specified in Section 09 91 00, Painting

B. Stair Framing:
1. Fabricate stringers of structural aluminum channels, or plates, or a combination thereof, as shown. Provide closures for exposed ends of stringers.
2. Construct platforms of structural aluminum channel headers and miscellaneous framing members, as shown. Bolt or weld headers to stringers. Bolt or weld framing members to strings and headers.

C. Aluminum Floor Plate Treads and Platforms:
1. Provide raised pattern aluminum floor plate. Provide pattern shown or, if not shown, as selected from manufacturer's standard patterns.
2. Form treads of 3/8-inch thick aluminum floor plate with integral nosing and back edge stiffener. Weld aluminum supporting brackets to stringers and bolt treads to brackets.
3. Fabricate platforms of aluminum floor plate of thickness shown. Provide nosing matching that on treads at all landings. Secure floor plates to platform framing members with bolts.

D. Stair Aluminum Railing:
1. Aluminum railings shall conform to the requirements of Section 05 52 15, Aluminum Handrails and Railings.

PART 3 – EXECUTION

3.1 INSPECTION

A. CONTRACTOR shall examine the conditions under which the Work is to be installed and notify the ENGINEER, in writing, of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide concrete inserts, anchor bolts, and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction.

3.3 INSTALLATION

A. Fastening to In-Place Construction:
1. Provide anchorage devices and fasteners where necessary for securing pre-engineered aluminum stairs to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through bolts and other connectors as required. The anchorage devices and fasteners shall be Type 316 stainless steel.

B. Cutting, Fitting and Placement:
1. Perform cutting, drilling, and fitting required for the installation of the pre-engineered aluminum stairs. Set the pre-engineered aluminum stairs accurately in

location, alignment, and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

2. Fit exposed connections accurately together to form tight hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind joints smooth and touch-up shop paint coat. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

END OF SECTION 05 51 17

SECTION 05 52 15

ALUMINUM HANDRAILS AND RAILINGS

PART 1 – GENERAL

1.1 SUMMARY

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, tools, equipment, and incidentals as shown, specified, and required to furnish and install aluminum handrail and railing systems. The Work also includes:
      a. Providing openings in, and attachments to, aluminum handrail and railing systems to accommodate the Work under this and other Specification Sections. Provide all items for aluminum handrails and railings, including anchorages, fasteners, studs, and other items required for which provision for is not specifically included under other Sections.
      b. Provide openings in and attachments to aluminum handrails and railings to accommodate work under other contracts. Assist other contractors in building on or attaching to aluminum handrails and railings all items such as fasteners and other items required for which provision is not specifically included under other contracts.
   2. Aluminum handrails and railings Work shall include components and features shown and specified, and all components and features available from specified manufacturers required for providing complete aluminum handrail and railing system in accordance with the Contract Documents.

B. Coordination:
   1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before aluminum handrails and railings Work.
   2. Notify other contractors in advance of installing aluminum handrail and railings to provide them with sufficient time to install items included in their contracts that are to be installed with or before aluminum handrails and railings Work.
   3. Aluminum handrail and railing locations shall comply with Laws and Regulations.

C. Related Sections:
   1. Section 03 60 00 – Grouting.
   2. Section 05 51 17 – Aluminum Stairs

1.2 REFERENCES

A. Standards referenced in this Section are:
   1. AA, Aluminum Design Manual.
   2. ASTM B26/B26M, Specification for Aluminum-Alloy Sand Castings.
   3. ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
   4. ASTM B136, Standard Method for Measurement of Stain Resistance of Anodic Coatings on Aluminum.
   5. ASTM B137, Standard Test Method for Measurement of Coating Mass per Unit

Area on Anodically Coated Aluminum.

6. ASTM B221, Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
7. ASTM B241/B241M, Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
8. ASTM B244, Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments.
9. ASTM B247, Specification for Aluminum and Aluminum-Alloy Die Forgings, Hand Forgings, and rolled Ring Forgings.
10. ASTM B429, Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
11. ASTM E 935, Standard Test Methods for Permanent Metal Railing Systems and Rails for Buildings.
12. NAAMM/Architectural Metal Products Division (AMP), Pipe Railing Manual.
13. NAAMM/AMP AMP-501 Finishes for Aluminum.

1.3 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer:
      a. Upon request manufacturer shall submit document at least five years successful experience in fabricating aluminum handrail and railing systems of scope and type like that required.
      b. Manufacturer shall be capable of providing custom detail drawings for the products required.
   2. Professional Engineer:
      a. CONTRACTOR or handrail and railing manufacturer shall retain a registered professional engineer legally qualified to practice in same state as the Site. Professional engineer shall have at least five years' experience designing aluminum handrails and railings.
      b. Responsibilities include:
         1) Reviewing aluminum handrail and railing system performance and design criteria stated in the Contract Documents.
         2) Preparing written requests for clarifications or interpretations of performance or design criteria for submittal to ENGINEER by CONTRACTOR.
         3) Preparing or supervising preparation of design calculations verifying compliance of aluminum handrail and railing system with requirements of the Contract Documents.
         4) Signing and sealing all calculations.
         5) Certifying that:
            a) Design of aluminum handrail and railing system was performed in accordance with performance and design criteria stated in the Contract Documents, and
            b) Design conforms to all applicable local, state, and federal Laws and Regulations, and to prevailing standards of practice.
   3. Installer:
      a. Retain a single installer trained and with record of successful experience in installing aluminum handrail and railing systems.

b. Installer shall have record of successfully installing aluminum handrail and railing systems in accordance with recommendations and requirements of manufacturer or shall provide evidence of being acceptable to the manufacturer.
c. Installer shall employ only tradesmen with specific skill and successful experience in the type of Work required.
d. When requested by ENGINEER, submit name and qualifications of installer with the following information for at least three successful, completed projects:
   1) Names and telephone numbers of owner and architect or engineer responsible for each project.
   2) Approximate contract cost of the aluminum handrail and railing systems for which installer was responsible.
   3) Amount (linear feet) of aluminum handrail and railing installed.

B. Component Supply and Compatibility:
1. Obtain all materials furnished under this Section regardless of component manufacturer, from a single aluminum handrail and railing system manufacturer.
2. Aluminum handrail and railing system manufacturer shall review and approve or prepare all Shop Drawings and other submittals (except for delegated design submittals, when professional engineer is retained by other than handrail and railing manufacturer) for all components furnished under this Section.
3. Components shall be specifically constructed for specified service conditions and shall be integrated into overall assembly by aluminum handrails and railings manufacturer.

C. Regulatory Requirements: Comply with Laws and Regulations including:
1. OSHA Part 1910.23, Guarding Floor and Wall Openings and Holes.

D. Certifications:
1. Submit certification, signed by authorized officer of manufacturer and notarized, stating that handrail and railing systems comply with the design prepared by the professional engineer.
2. Submit certification, signed by authorized officer of CONTRACTOR and notarized, stating that all components and fittings are furnished by the same manufacturer.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:
1. Shop Drawings:
   a. Drawings for fabrication and installation of aluminum handrail and railing systems with sizes of members, pipe wall thickness, information on components, and anchorage devices. Show all anchorages. Provide details drawn at scale of 1.5-inch equal to one foot.
   b. Indicate required location of posts.
   c. Indicate locations and details of all expansion joints, if any.
   d. Indicate locations and details of gaps across seismic joints, if any.
   e. Profile drawings of aluminum handrail and railing system components.
   f. Custom detail drawings. Details of forming, jointing, sections, connections,

internal supports, trim and accessories. Provide details drawn at scale of 1.5-inch equal to one foot.

2. Product Data:
   a. Manufacturer's specifications, standard detail drawings, and installation instructions for aluminum handrail and railing systems.
   b. Manufacturer's catalogs showing complete selection of standard and custom components and miscellaneous accessories for selection by ENGINEER.
3. Delegated Design Submittals:
   a. Design Data:
      1) Design computations or complete structural analysis of handrail and railing systems, signed and sealed by professional engineer. Professional engineer's seal shall be clearly legible, including state of registration, registration number, and name on seal.
      2) Certification by professional engineer that professional engineer has performed design of aluminum handrail and railing systems in accordance with performance and design criteria stated in the Contract Documents, and that design conforms to all local, state, and federal Laws and Regulations, and to prevailing standards of practice.
4. Samples:
   a. Full-size Sample, two feet long, of assembled railing system at post and rail intersections. Sample shall have all associated components including typical connections, mounted toeboard and sleeve, and handrail at wall return, complete with mounting brackets, all with specified controlled uniform metal finish.
   b. Color Samples: Maximum range of clear, anodized aluminum that shall appear in finished Work. Prepare range Samples, to show highest level of color control feasible for actual handrail and railing systems, as determined by licensor of finishing process specified, on actual extrusions and castings of the Work.
   c. ENGINEER will review Samples for finish, color, joint tolerances, workmanship, and general component assembly only. Compliance with other requirements is the responsibility of the CONTRACTOR.
5. Test Procedure: Submit detailed description of proposed shop testing procedures. Do not perform shop testing until ENGINEER approves shop test procedure:

B. Informational Submittals: Submit the following:
   1. Certificates:
      a. Certification on source of supply, as specified in Article 1.3 of this Section.
      b. Manufacturer certification specified in Article 1.3 of this Section.
   2. Source Quality Control Submittals:
      a. Manufacturer's load testing report in accordance with ASTM E935 for completed aluminum handrail and railing systems, demonstrating compliance with applicable requirements of building codes, safety codes, and other Laws and Regulations.
   3. Qualifications Statements: Submit qualifications for the following:
      a. Manufacturer, when requested by ENGINEER.
      b. Professional engineer.
      c. Installer, when requested by ENGINEER. Qualifications statement shall

include record of experience with specified references.

C. Closeout Submittals: Submit the following:
   1. Maintenance Manuals: Furnish detailed maintenance manuals that include the following:
      a. Product name and number.
      b. Detailed procedures for routine maintenance and cleaning, including cleaning materials, application methods and precautions in use of products that may be detrimental to finish when improperly applied.
      c. Handrail and railings systems manufacturer's current catalog including individual parts.
      d. Maintenance manuals shall be in accordance with Division 01 Specifications.
   2. Guarantee: Provide in maintenance manual with the guarantee specified.

1.5 DELIVERY, STORAGE AND HANDLING

A. Storage and Protection:
   1. Keep products off ground using pallets, platforms, or other supports. Protect products from corrosion and deterioration.

B. Handling of Products:
   1. Do not subject handrail and railing products to bending or stress.
   2. Do not damage edges or handle products in a manner that will cause scratches, warping, or dents.
   3. Protect handrails and railings by paper or coating as acceptable to handrail and railing manufacturer, against scratching, splashes of mortar, paint, and other marring during transportation, handling, and erection. Protect until completion of adjacent work.

1.6 GUARANTEE

A. Guarantee: Manufacturer shall provide written guarantee of availability of replacement parts and components for period of at least five years after completion of the Project.

PART 2 – PRODUCTS

2.1 SYSTEM PERFORMANCE

A. System Description: Aluminum handrail and railing system shall consist of equally spaced horizontal rails with totally concealed mechanical fasteners, internally threaded tubular rivets and components fastened to posts spaced no more than five feet on centers and system of handrails supported from adjacent construction by mounting brackets spaced at no more than five feet on centers.

B. Design Criteria and Performance Criteria:
   1. Design, fabricate, and install aluminum handrail and railing systems to withstand the most critical effects resulting from the following loads (loads listed below do not act concurrently):
      a. Uniform Load: 50 pounds per foot, applied at top in any direction.
      b. Concentrated Load: 200 pounds single load, applied at any point along the top in any direction.
      c. Components: Intermediate rails (all rails except the handrail), balusters, and panel fillers, if any, shall withstand horizontally applied normal load of 50 pounds on an area equal to one square foot, including openings and space between rails. Reactions due to this loading are not required to be superimposed to loading specified for main supporting members of handrails and railings.
      d. Comply with AA Aluminum Design Manual for determining allowable stresses and safety factors for aluminum structural components.
      e. Limit deflection in each single span of railing and handrail to 1.5-inch maximum, and to 1/4-inch maximum on railing posts. Applied loads shall not produce permanent deflection in the completed Work when loads are removed.
   2. Thermal Control: Provide adequate expansion within fabricated systems that allows for thermal expansion and contraction caused by material temperature change of 140 degrees F to -20 degrees F without warp or bow of system components. Distance between expansion joints shall be based on providing 1/4-inch wide joint at 70 degrees F, which accommodates movement of 150 percent of calculated amount of movement for specified temperature range.
   3. Where handrail and railing systems cross expansion joints in the building or structure, provide expansion joints in handrail and railings systems.
   4. For posts located at or near end of runs as shown, uniformly space intermediate posts as required to conform to loading and deflection criteria specified, at intervals no greater than maximum post spacing specified. Where posts are shown for handrails along both sides of walkways and other similar locations, locate posts opposite each other; do not stagger post locations.

2.2 MANUFACTURERS

A. Products and Manufacturers: Provide one of the following:
   1. Custom Fabricated Connectorail System, by Julius Blum & Company, Inc.
   2. Custom Fabricated Series 500 Non-Welded Aluminum Pipe Aluminum handrails and railing systems, by Superior Aluminum Products, Inc.

3. Or equal.

2.3 MATERIALS

A. Extruded Aluminum Architectural and Ornamental Shapes: ASTM B221, Alloy 6063-T52.

B. Aluminum Forgings: ASTM B247.

C. Extruded or Drawn Aluminum Pipe and Tube:
   1. ASTM B429 or ASTM B241/B241M, Alloy 6063-T5, 6063-T52, or 6063-T832 as required by loadings, deflections, and post spacing specified.
   2. Provide Schedule 40 pipe, minimum, unless conditions of detail and fabrication require extra-heavy pipe to comply with Specifications. Rails and posts shall have minimum outside diameter of 1.90 inches.

D. Reinforcing Bars: Solid, circular profile, two feet long, 6061-T6 aluminum reinforcing bars with same outside diameter as inside diameter of post.

E. Anchors and Fastenings:
   1. For anchors and fasteners, use Type 316 stainless steel; minimum 3/8-inch diameter.
   2. Provide minimum of four bolt fasteners per post where surface-mounted posts are shown. Components shall be in accordance with manufacturer's recommendations and as approved or accepted (as applicable) by ENGINEER on submittals.
   3. Anchors: Stainless steel, capable of withstanding structural design loads specified

F. Castings:
   1. Provide high-strength aluminum alloy brackets, flanges, and fittings suitable for anodizing as specified.
   2. Aluminum alloy sand castings: ASTM B26/B26M.

G. Connector Sleeves: Schedule 40, five-inch long by 1.610-inch diameter.

H. Sockets: Provide six-inch deep by 2.5-inch outside diameter aluminum sockets with 3.5-inch-wide socket cover on bottom of each socket and on top and bottom of removable post sockets.

I . Custom Cover Flanges: 1/4-inch high by four-inch diameter, aluminum.

J. Adhesive: Two-part waterproof epoxy-type as recommended by handrail and railing systems manufacturer.

K. Non-shrink Grout: Comply with Section 03 60 00 – Grouting.

L. Toeboards:
   1. Provide extruded Alloy 6063-T5 or T52 aluminum alloy toeboards, unless railing is mounted on curbs or other construction of sufficient height and type to comply with OSHA 1910.23. Bars or plates are not acceptable.

2. Unless otherwise specified, toeboards shall comply with OSHA 1910.23, Section (e).

M. System Components and Miscellaneous Accessories: Provide complete selection of manufacturer's standard and custom aluminum handrail and railing systems components and miscellaneous accessories required. Show type and location of all such items on Shop Drawings and other submittals as applicable.

2.4 FABRICATION

A. General: Unless otherwise shown or specified, provide typical non-welded construction details and fabrication techniques recommended in NAAMM/AMP Pipe Railing Manual and NAAMM/AMP AMP 501.

B. Fabricate handrail and railing systems true to line and level, with accurate angles surfaces and straight edges. Fabricate corners without using fittings. Provide bent- metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work. Form elbow bends and wall returns to uniform radius, free from buckles and twists, with smooth finished surfaces, or use prefabricated bends. Provide not less than four-inch outside radius.

C. Remove burrs from exposed edges.

D. Close aluminum pipe ends by using prefabricated fittings.

E. Weep Holes:
1. Fabricate joints that will be exposed to weather to exclude water.
2. Provide 15/64-inch diameter weep holes at lowest possible point on each post in handrail and railing systems.
3. Provide pressure relief holes at closed ends of handrail and railing systems.

F. Toeboards:
1. Provide manufacturer's standard toeboard, that accommodates movement caused by thermal change specified without warping or bowing toeboards.
2. Provide manufacturer's standard toeboard, which accommodates storage for removable socket covers.
3. Coordinate and cope toeboard as required to accommodate cover flanges at posts.
4. Toeboards shall follow curvature of railing. Where railing is shown to have curved contours at corners, or other locations, toeboard shall likewise be curved to follow line of railing system.

G. Reinforcing Bars: Provide reinforcing friction-fitted bar at each post in railing system. Extend reinforcing bars of tubes six inches into cast-in-place sleeves or other types of supporting brackets.

H. Mechanically Fitted Component Pipe Handrail and Railing System:
1. Use non-welded pipe handrail and railing system with posts, top and intermediate rail(s), and flush joints.

2. Provide top and one intermediate horizontal rail(s), equally spaced.
3. Do not use blind rivets, pop rivets, or other exposed fastening devices in the Work under this Section. Fasteners used for side-mounting fascia flanges where shown or specified may be exposed in the Work. Provide internal threaded aluminum rivets, stainless steel through-bolts with lock nuts, stainless steel sheet metal screws with lock washers, and epoxy adhesive for fastening components of the Work.

2.5 FINISHES

A. General:
1. Prepare surfaces for finishing in accordance with recommendation of aluminum producer and the aluminum finisher or processor.
2. Adjust and control direction of mechanical finishes specified to achieve best overall visual effect in the Work.
3. Color and Texture Tolerance: Provide uniform color and continuous mechanical texture for aluminum components. ENGINEER reserves the right to reject aluminum materials because of color or texture variations that are visually objectionable, but only where variation exceeds range of variations established by manufacturer prior to fabrication, by means of range of Samples approved by ENGINEER.
4. Anodize aluminum components.

B. Finish:
1. Mechanically finish aluminum by wheel or belt polishing with aluminum oxide grit of 180 to 220 size, using peripheral wheel speed of 6,000 feet per minute; AA Designation - M32 Medium Satin Directional Texture.
2. Hand-Rubbed Finish: Where required to complete the Work and provide uniform, continuous texture, provide hand-rubbed finish to match medium satin directional texture specified to even out and blend satin finishes produced by other means.

C. Cleaning:
1. Provide non-etching chemical cleaning by immersing aluminum in inhibited chemical solution, as recommended by coating applicator, to remove lard oil, fats, mineral grease, and other contamination detrimental to providing specified finishes.
2. Clean and rinse with water between steps as recommended by aluminum manufacturer.

D. Exposed Aluminum Anodic Coating:
1. Provide anodic coatings as specified that do not depend on dyes, organic or inorganic pigments, or impregnation processes to obtain color. Apply coatings using only the alloy, temperature, current density, and acid electrolytes to obtain specified colors in compliance with designation system and requirements of NAAMM/AMP Pipe Railing Manual and NAAMM/AMP AMP 501. Comply with the following:
2. Provide Architectural Class I high density anodic treatment by immersing the components in tank containing solution of 15 percent sulfuric acid at 70 degrees F with 12 amperes per square foot of direct current for minimum of sixty minutes; AA Designation A41 Clear.
3. Physical Properties:
   a. Anodic Coating Thickness, ASTM B244: Minimum of 0.7-mils thick.

b. Anodic Coating Weight, ASTM B137: Minimum of 32 mg/sq. in.
c. Resistance to Staining, ASTM B136: No stain after five minutes dye solution exposure.
d. Salt Spray, ASTM B117: 30,000 hours exposure with no corrosion or shade change.

4. Seal finished anodized coatings using deionized boiling water to seal pores and prevent further absorption.
5. Products and Manufacturers: Provide one of the following:
   a. Alumilite 215 Clear by Aluminum Company of America, Inc.
   b. Or equal.

2.6 SOURCE QUALITY CONTROL

A. Allowable Tolerances:
   1. Limit variation of cast-in-place inserts, sleeves and field-drilled anchor and fastener holes to the following:
      a. Spacing: Plus-or-minus 3/8-inch.
      b. Alignment: Plus-or-minus 1/4-inch.
      c. Plumbness: Plus-or-minus 1/8-inch.
   2. Minimum Handrails and Railings Systems Plumb Criteria:
      a. Limit variation of completed handrail and railing system alignment to 1/4-inch in 12 feet with posts set plumb to within 1/16-inch in 3.0 feet.
      b. Align rails so variations from level for horizontal members and from parallel with rake of stairs and ramps for sloping members do not exceed 1/4-inch in 12.0 feet.
   3. Provide “pencil-line” thin butt joints.

B. Factory Testing:
   1. Perform load test on completed handrail and railing systems. Extent of handrail and railing systems to be factory-tested shall be as shown and specified. Load test completed handrail and railing systems in accordance with requirements of ASTM E935. Provide written report to ENGINEER identifying and documenting testing methods used, magnitude and location of loads superimposed, and results of such tests on actual completed handrail and railing systems, including all anchors and fasteners to be used in the Work. Testing setup shall simulate actual conditions of installation to be used in the Work.
   2. Do not ship products from factory until ENGINEER accepts load testing report.

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine conditions under which Work will be performed and notify ENGINEER in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with installation until unsatisfactory conditions are corrected.

B. Verify to ENGINEER the gage of aluminum pipe railing posts and rails brought to the Site by actual measurement of on-Site material in presence of ENGINEER.

3.2 INSTALLATION

A. General:
   1. Do not erect components that are scarred, dented, chipped, discolored, otherwise damaged, or defaced. Remove from Site railing and handrail system components that have holes, cuts, gouges, deep scratches, or dents of any kind. Repairs to correct such Work will not be accepted. Remove and replace with new material.
   2. Comply with installation and anchorage recommendations of NAAMM/AMP Pipe Railing Manual and NAAMM/AMP AMP 501 in addition to requirements specified and approved or accepted (as applicable) submittals.

B. Fastening to In-Place Construction:
   1. Remove protective plastic immediately before installation.
   2. Adjust handrails and railings prior to securing in place, to ensure proper matching at butting joints and correct alignment throughout their length. Plumb posts in each direction. Secure posts and rail ends to building or structure as follows:
      a. Anchor posts in concrete by providing sockets set and anchored into concrete floor slab. Provide closure secured to bottom of sleeve. Before installing posts, remove debris and water from sleeves. Verify that reinforcing bars or tubes have been inserted into posts before installation. Do not install posts without reinforcing bar. For all non-removable handrail and railing systems sections, after posts have been inserted into sockets, fill annular space between posts and sockets solid with grout as specified in Section 03 60 00 – Grouting. Crown the grout and slope grout to drain away from posts.
      b. Provide posts set in concrete with an aluminum floor cover flange.
   3. Use devices and fasteners recommended by handrail and railing systems manufacturer and as shown on approved or accepted (as applicable) submittals.

C. Cutting, Fitting, and Placement:
   1. Perform cutting, drilling, and fitting required for installation. Set the Work accurately in location, alignment, and elevation, plumb, level, true, and free of rack, measured from established lines and levels.
   2. Fit exposed connections accurately together to form tight hairline joints. Do not cut or abrade surfaces of units that have been finished after fabrication and are intended for field connections.
   3. Make permanent field splice connections using manufacturer's recommended epoxy adhesive and five-inch minimum length connector sleeves. Tight press-fit field splice connectors and install in accordance with manufacturer's written instructions. Follow epoxy manufacturer's recommendations for requirements of installation and conditions of use.
   4. Make splices as near as possible to posts, but not exceeding 12 inches from nearest post.
   5. Field welding is not allowed. Make splices using pipe splice lock employing a single allen screw to lock joint.
   6. Secure handrails to walls with wall brackets and end fittings as shown. Drill wall plate portion of the bracket to receive one bolt, unless otherwise shown for concealed anchorage. Locate brackets as shown or, if not shown, at not more than

five feet on centers. Provide flush type wall return fittings with same projection shown for wall brackets. Secure wall brackets and wall return fittings to building or structure.

7. Securely fasten toeboards in place with not more than 1/4-inch clearance above floor level.
8. Drill one 15/64-inch diameter weep hole not more than 1/4-inch above top of location of solid reinforcing bar or tube in each post.

D. Expansion Joints:
1. Provide slip joint with internal sleeve extending not less than two inches beyond joint on each side.
2. Construct expansion joints as for field splices, except fasten internal sleeve securely to one side of rail only.
3. Locate joints within six inches of posts.

E . Protection from Dissimilar Materials:
1. Coat aluminum surfaces in contact with dissimilar materials such as concrete, masonry, and steel, in accordance with Section 09 91 00, Painting.
2. Do not extend coating beyond contact surfaces. Remove coating where exposed-to-view in the finished Work.

3.3 CLEANING AND REPAIRING

A. Cleaning:
1. Clean exposed surfaces of handrail and railing systems after completion of installation. Comply with recommendations of both handrail and railing system manufacturer and finish manufacturer. Do not use abrasives or unacceptable solvent cleaners. Test cleaning techniques on an unused section of railing before employing cleaning technique.
2. Remove stains, dirt, grease, and other substances by washing handrails and railings systems thoroughly using clean water and soap; rinse with clean water.
3. Do not use acid solution, steel wool, or other harsh abrasives.
4. If stain remains after washing, remove defective sections and replace with new material complying with this Section.

B. Handrails and railings shall be free of dents, burrs, scratches, holes, and other blemishes. Replace damaged or otherwise defective Work with new material that complies with this Section at no additional cost to OWNER.

C. Prior to Substantial Completion, replace adjacent work marred by the Work of this Section.

END OF SECTION 05 52 15

ITEM 627.0006 25 WOOD, PLASTIC, AND COMPOSITES

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0006 25 **WOOD, PLASTIC, AND COMPOSITES**

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 06 50 00 – STRUCTURAL PLASTICS

6.02 This item shall include, but not be limited to, the following:

A. The work includes furnishing and installing a fiberglass reinforced plastic (FRP) tank cover system, including deck panels, structural supports, access hatches, flashing, gaskets, fasteners, and related accessories for the sludge holding tank.

B. Providing engineered FRP components that meet specified structural loads, slip resistance, air leakage, and fire performance criteria, along with shop drawings, testing data, and manufacturer certifications.

C. Installation includes proper handling, anchorage, sealing, and alignment of all cover components in accordance with approved drawings and manufacturer requirements, with a one-year material and workmanship warranty

D. Shop drawings and calculations stamped by a New York State Professional Engineer.

E. Protection of installed roof system during construction.

F. Safety line and fall-protection anchorage system.

G. Manufacturer’s field inspection with written report.

H. All warranties required by Section 06 50 00

SECTION 06 50 00

STRUCTURAL PLASTICS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Glass fiber reinforced plastic (FRP/GRP) tank cover deck panels.

B. Glass fiber reinforced plastic (FRP/GRP) structural supports.

C. Flashing and trim.

D. Fasteners and anchors.

E. Gaskets.

F. Accessories and appurtenances.

G. Covers for these tanks, channels, and other areas:
   1. Proposed Sludge Holding Tank

1.2 RELATED SECTIONS

A. Section 03 30 00 – Cast-in-Place Concrete

1.3 REFERENCES

A. ASTM D638, Standard Test Method for Tensile Properties of Plastics

B. ASTM D790, Standard Test Method for Flexural Properties of Plastics

C. ASTM D695, Standard Test Method for Compressive Strength of Plastics

D. ASTM E84, Standard Test Method for Surface Burning Characteristics of Plastics

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used including:
   1. Calculations, design data, and test reports as applicable indicating compliance with requirements.
   2. Storage and handling instructions.
   3. Installation instructions.

B. Drawings including layouts, product description, connection and framing details, fastener types and spacing.

C. Miscellaneous certifications.

1.5 QUALITY ASSURANCE

A. Tank cover supplier shall manufacture and fabricate all FRP components in its own facility, which must be ISO 9001 certified.

B. Tank cover manufacturer shall have completed minimum of ten (10) projects of similar type as required in this scope within the last five years.

C. Contractor shall verify all field dimensions for development of manufacturer's drawings.

D. Contractor shall review and confirm in writing approval of manufacturer's drawings.

1.6 PRODUCT SUBSTITUTIONS

A. Substitutions shall be considered if Engineer has received written request at least two weeks prior to bid date. If substitutions are acceptable, bidders shall be notified by addendum.

B. Requests for substitutions shall include technical information, including but not limited to air leakage test report and structural performance data.

1.7 PERFORMANCE TESTING

A. Materials shall comply with Federal and Local laws or ordinances, applicable codes, standards, regulations, and/or regulatory agency requirements.

B. Structural framing and deck panels shall meet performance and design criteria listed herein for span conditions indicated on drawings. Individual units shall demonstrate compliance with design criteria by large-scale testing.
   1. FRP Deck Panels: Uniform Load and Deflection Test
   2. FRP Structural Components: 3 Point Load Bending Test

C. Air Leakage
   1. Air leakage shall not exceed .2 CFM/SF at negative pressure of .2 inches of water column for 5-minute duration per air Leakage Test in accordance with Procedural Standards for Adjusting, Balancing, of Environmental Systems.
   2. Testing shall be conducted by independent test agency certified by Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB).

1.8 DESIGN CRITERIA

A. Design Loads shall comply with local codes with combined loads determined by Allowable Stress Method.
   1. Snow: 50 psf
   2. Wind Uplift: 13.9 psf
   3. Concentrated Load: 300 pounds

a. Deck panels: Individual unit weight plus other materials attached to and supported by panels.
b. Cover structure: Individual unit weight plus other materials attached to and supported by cover structure.

B. Design Limits
1. Dead + Live or Snow Load: Limit = 50 psf (min); Factor of Safety = 2.5
2. Wind Uplift less Dead Load: Deflection Limit = L/180; Factor of Safety = 2.5
3. Personnel Load: Cover shall be capable of supporting 300 lb. concentrated load over 30”x30” area located at panel midspan with L/180 deflection limit or deflection not exceeding 5/8”.

C. Cover Panel Removability:
1. Each cover panel shall be removable without having to remove any adjacent cover panel.
2. Each cover panel shall be removable vertically and without cutting of a cover component.

D. Slip Resistance of Cover System
1. Cover panels, end-to-end joint flashing and side-joint, locking channel shall utilize TreadMAX™ integral, non-skid surface technology or meet the following criteria:
a. The cover shall have a slip-resistant walking surface designed for operator foot traffic.
b. Non-skid surface shall be an integral (embedded) part of the cover panel and not achieved by use of coatings/paint, adhesive tapes, or other applied product after the manufacturing process.
2. Slip resistance tread shall be at minimum bi-directional. Minimum average Dynamic Coefficient of Friction (DCOF) shall be 0.50 per ANSI A137.1/A326.3 Dynamic Coefficient of Friction Test.
3. Minimum wet Pendulum Test Value (PTV) shall be 45, with Four S (96) hard rubber slider, per AS HB198:2014 (AS/NZS 4586) Pendulum Test.

PART 2 – PRODUCTS

1.1 MANUFACTURER(S)

A. The standard for design, characteristics, and performance shall be AXS-NS (XL3) Cover System as manufactured by Enduro Composites, Inc., Houston, TX or approved equal.

2.2 MATERIALS

A. Fiberglass reinforced plastic (FRP) structural components including cover panels, beams, and framing shall be manufactured by pultrusion process. Contact molded or hand-laid up fiberglass materials shall not be acceptable as structural components.

B. Tank Cover Panels
1. Resin type for FRP tank cover decking shall be UV stabilized, Isophthalic Polyester or Vinyl Ester. Orthothalic polyester (general purpose) is not acceptable.

2. Glass fiber reinforcements shall be 50% (min) of the material weight.
3. Materials shall be fire retardant and have flame spread rating of 25 or less per ASTM E84.
4. Materials shall exhibit these Physical Properties (at a minimum):

Tensile Strength	30,000 psi	ASTM D 638
Flexural Strength	30,000 psi	ASTM D 790
Flexural Modulus	2,270,000 psi	ASTM D 790
Compressive Strength	30,000 psi	ASTM D 695
Izod Impact (Notched)	20	ASTM D 256
Water Absorption	.20% max	ASTM D 570

5. Cover panels shall be sealed at side-laps with EPDM gasket. Side-lap gaskets shall be factory installed and oriented
   vertically so they are compressed when the locking channel is placed into position.
6. Cover panels shall utilize TreadMAX™ non-skid surface technology or approved equal.
7. Color of deck panels shall be standard gray.

C. Access Hatches (as shown and detailed on plan drawings)
1. Access hatches shall be raised or flat with one-leaf hatch door and fabricated from pultruded fiberglass components.
2. Access hatches and framing shall fit inside a single deck panel so individual deck panels with hatches can be removed without affecting adjacent panels.
3. Underside of raised hatch lids shall be sealed with factory installed, 3/8” diameter neoprene bulb gasket. Perimeter hatch curb shall be sealed to decking surface with adhesive sealant.
4. Underside of Flat hatch lids shall be sealed with factory installed, 1/4” EPDM Flat gasket. Perimeter hatch curb shall be sealed to decking surface with adhesive sealant.
5. Access Hatches shall have a stainless steel, gas piston hold open device. Gas Piston shall be designed to aid in opening and to hold open the hatch once locked in place.
6. Hatch lids shall have factory applied non-skid, UV resistant surface with plastic or stainless-steel lift handles.

D. FRP Structural Framing (as shown and detailed on plan drawings)
1. Resin type for FRP beams and framing members shall be vinyl ester.
2. Glass fiber reinforcements shall be 50% (min) of the material weight.
3. Structural components shall be fire retardant with flame spread rating of 25 or less per ASTM E84.
4. If cover is flush mounted, ledger angles shall be FRP or 316 stainless steel.
5. All connections for attachment to FRP beams or fastening connections shall be 316 stainless steel angles or plates. Use of FRP for connections shall not be allowed.

E. Trusses (if indicated by manufacturer or drawings) Trusses shall be designed and provided by tank cover manufacturer and conform to these specifications:
1. Truss components not exposed to inside of tank shall be galvanized steel.
2. Truss components exposed to inside of tank shall be stainless steel.
3. Trusses shall have minimum 6’6” of headspace from top of tank cover to bottom of top chord.
4. Trusses shall be provided in sections (30 ft. max length) to be bolted together by the contractor.

F. Flashing and Trim
    1. FRP flashing shall be isophthalic polyester with dimensions, and profile as shown on the drawings.
    2. Non-radius end flashing shall be factory attached to individual deck panels.
    3. Flashing with a radius or at the perimeter of a circular tank shall be a separate part and field attached by the installation contractor.
    4. Slide gate flashings (if indicated on drawings) shall be aluminum brush type.

G. Air Vents and Connections (if indicated on drawings)
    1. FRP gooseneck ventilation piping (if indicated on drawings) with bird screen shall be provided by cover manufacturer.
    2. FRP stub-vent connections with a blind flange (if indicated on drawings) shall be provided by cover manufacturer.
    3. Connections shall extend at least 6 inches from top of tank cover deck.

H. Valve Operator Nuts
    1. Existing or new pipe penetrations shall be retrofitted by contractor to penetrate cover at 90-degree angle.
    2. Pipe penetrations shall be flashed in the field with a Sealtite retrofit, zipper type, pipe flashing or equal as provided by cover manufacturer.

I. Hardware
    1. Fasteners, anchorage, hinges, and other structural accessories located on underside of cover shall be: 316 Stainless Steel
    2. Perimeter flashing anchors, concrete anchors, or other hardware not exposed to the inside environment of tank shall be 304 Stainless Steel.
    3. Fasteners to attach tank cover decking to structural supports shall be: 316 Stainless Steel

J. Gaskets and Sealants
    1. All panel side laps and perimeter conditions shall have gaskets.
    2. Gaskets under flashing with radius and at perimeter of circular tanks shall be installed by the contractor.
    3. Adhesive sealant shall be applied by contractor at various locations as required by manufacturer for odor containment.

PART 3 – EXECUTION

3.1 MATERIAL HANDLING

A. At time of delivery, all materials shall be inspected for shipping damage. Freight company and manufacturer shall be notified immediately of any damage or quantity shortages.
B. Contractor shall protect FRP materials from cuts, scratches, gouges, abrasions, and impacts. When lifting FRP materials: spreader bars shall be used (not wire slings unless materials are fully protected). FRP components shall not be dragged across one another unless separated by a non-scratching spacer.

3.2 INSTALLATION

A. Before placing and attaching components, erector must confirm alignment and location of bearing plates, surfaces, brackets, saddles, etc. All bearing surfaces must be clean and free of debris.

B. Before placing secondary framing members or deck, erector must check the alignment and location of supports.

C. Erection shall proceed according to sequence shown on the approved drawings.

D. If applicable, contractor shall install structural members, beam seats, or ledger angles in locations shown on the approved drawings. Contractor shall assemble trusses as required.

E. Position FRP tank cover beams (if applicable) in locations, as shown on the manufacturer's drawings. Field modifications (cuts, copes, holes, etc.) other than work shown on the drawings are not allowed without manufacturer's written consent.

F. Anchor FRP beams and adjust tank cover components into final position with proper bearing and alignment at joints, laps, and supports before fastening. Refer to manufacturer's installation instructions for proper fastener selection, fastener location, driving techniques, and pertinent information for fastening equipment.

G. Starting at end shown on the manufacturer's drawings, position and place cover deck panels in locations as shown. Field modifications (cuts, copes, holes, etc.) other than work shown on the drawings are not allowed without manufacturer's written consent.

H. Fasten or anchor FRP cover deck panels into location as shown on the drawings.

I. Place and attach flashing as shown on the shop drawings.

3.3 WARRANTY

A. The cover manufacturer shall warrant that the work described herein shall be free from defects, workmanship and material. The flat cover manufacturer shall replace, or repair only faulty workmanship or defective material furnished by it that is reported to it within one (1) year from the date of shipment

END OF SECTION 06 50 00

ITEM 627.0007 25 THERMAL AND MOISTURE PROTECTION

1. DESCRIPTION:

1.01 This item shall consist of furnishing all labor, materials, equipment, and services necessary to provide a complete aluminum metal roof panel system, including structural framing, roof panels, flashing, fasteners, anchors, sealants, accessories, safety line system, and appurtenances, in accordance with the Contract Plans and Specifications.

1.02 The work includes engineering, fabrication, delivery, installation, inspection, testing, and warranty of the aluminum roof system as shown on the Drawings and specified herein.

2. MATERIALS:

2.01 Materials shall conform to the requirements of Part 2 – Products of the Sections listed in the Specification Summary of this Item.

3. CONSTRUCTION DETAILS

3.01 Construction methods and installation procedures shall conform to the requirements of Part 3 – Execution of the Sections listed in the Specification Summary of this Item.

4. METHOD OF MEASUREMENT

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT

5.01 Payment for this item shall be made at the lump sum price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 The lump sum price shall include, but not be limited to:

A. Engineering and preparation of shop drawings and structural calculations stamped and signed by a Professional Engineer licensed in the State of New York

B. Furnishing and installing aluminum roof panels and structural framing

C. Furnishing and installing anchors, fasteners, flashings, trims, closures, bird screens, and sealants

D. Furnishing and installing safety line and fall-protection anchorage system

E. Performance testing and manufacturer’s field inspection

F. Coordination with concrete structures and process equipment below the roof
G. Protection of installed work and replacement of damaged materials

H. All labor, materials, tools, equipment, and incidentals necessary to complete the work

I. Warranties required by the Specifications

5.03 Detailed Estimate:

A. Prior to the first partial payment, the Contractor shall submit a detailed estimate of quantities and prices for all work under this item, which shall total the lump sum price bid.

B. The estimate shall be in the same sequence as the Sections listed in the Specification Summary.

C. The Engineer may revise the estimate as necessary to reflect true values.

D. Progress payments shall be based on the approved detailed estimate.

6. SPECIFICATION SUMMARY

6.01 This item includes the following Specification Sections:
A. Section 07 41 13 – Aluminum Metal Roof Panels

6.02 This item shall include, but not be limited to, the following:

A. Engineered aluminum roof panel system for circular concrete structures.

B. Structural aluminum framing and roof panels.

C. Shop drawings and calculations stamped by a New York State Professional Engineer.

D. Flashings, trims, closures, bird screens, and sealants.

E. Safety line and fall-protection anchorage system.

F. Manufacturer’s field inspection with written report.

G. Laboratory performance testing for air infiltration, water penetration, and wind uplift.

ITEM 627.0007 25 **THERMAL AND MOISTURE PROTECTION**

H. Protection of installed roof system during construction.

I. Final demonstration and Owner training.

J. All warranties required by Section 07 41 13 – Aluminum Metal Roof Panels.

SECTION 07 41 13

ALUMINUM METAL ROOF PANELS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Engineered aluminum metal roof panel system for circular concrete process tanks and structures.
   2. Structural aluminum framing supporting roof panels.
   3. Flashings, sealants, anchors, fasteners, closures, and accessories required for a complete roof system.

B. Work includes engineering, fabrication, delivery, installation, inspection, testing, and warranty of a complete aluminum roof system.

C. Related Requirements:
   1. Section 03 30 00 – Cast-in-Place Concrete.
   2. Section 08-91-19 – Operable Louvers
   3. Section 23-34-23 – Direct Drive Side Wall Mounted Propeller Fan
   4. Section 46 53 24 – Trickling Filter Media and Distribution System.

1.2 REFERENCES

A. ASCE 7 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures.

B. New York State Building Code (BCNYS).

C. AWWA D108 – Aluminum Dome Covers.

D. ASTM B209 – Aluminum Sheet and Plate.

E. ASTM B221 – Aluminum Extrusions.

F. ASTM A240 – Stainless Steel Sheet and Plate.

G. ASTM C920 – Elastomeric Joint Sealants.

H. Aluminum Design Manual, Aluminum Association.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer’s literature describing roof system components and materials.

B. Shop Drawings:
   1. Roof plan, elevations, and sections.
   2. Panel layout and joint locations.
   3. Framing member sizes and layout.
   4. Anchorage and embedment details.
   5. Flashing, penetration, and edge details.
   6. Safety line and fall-protection layout.

C. Engineering Submittals:
   1. Structural design calculations and drawings for the complete aluminum roof system.
   2. Calculations and drawings shall be prepared, stamped, and signed by a Professional Engineer licensed in the State of New York.
   3. Calculations shall demonstrate compliance with ASCE 7 and the NYS Building Code.

D. Performance Test Reports:
   1. Laboratory test data demonstrating compliance with ASTM standards for air infiltration, water penetration, and wind uplift.

E. Samples:
   1. Roof panel finish sample.
   2. Sealant and flashing samples.

F. Operation and Maintenance Manuals.

G. Warranty documentation.

1.4 QUALITY ASSURANCE

A. Manufacturers' Qualifications:
   1. Minimum ten (10) years documented experience designing and fabricating aluminum roof systems for municipal or industrial facilities.

B. Installer Qualifications:
   1. Installer shall be trained and approved by manufacturer.
   2. Installer shall have experience with similar aluminum roof systems.

1.5 FABRICATION QUALITY CONTROL

A. Factory fabricate panels and framing members.

B. Maintain documented quality-control procedures for fabrication.

C. Verify dimensional tolerances prior to shipment.

1.6 REINSTALLATION MEETINGS

A. Conduct preinstallation conference at Project site prior to delivery of roof materials.
    1. Attendees: Owner's Representative, Engineer of Record, manufacturer's representative, roof installer, structural-support installer, and installers of interfacing work.
    2. Review project schedule and sequencing.
    3. Review stamped shop drawings and calculations.
    4. Examine supporting structure for alignment and tolerances.
    5. Review design loading criteria and construction-phase load restrictions.
    6. Review flashing, penetrations, drainage, and equipment interfaces.
    7. Review applicable codes, insurance, inspection, and safety requirements.
    8. Review protection measures during installation.
    9. Review procedures for repair or replacement of damaged components.
    10. Record and distribute meeting minutes.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original packaging.

B. Store materials off ground and protected from moisture, dirt, and damage.

C. Handle aluminum components to prevent distortion and surface damage.

1.8 WARRANTY

A. Provide manufacturer's written warranty for aluminum roof system.

B. Warranty period shall be **not less than ten (10) years** from date of Substantial Completion.

C. Provide extended warranty of **twenty (20) years** from date of Substantial Completion.

D. Warranty shall cover:
    1. Defects in materials and workmanship.
    2. Structural performance of framing and panels.
    3. Watertightness of roof system and flashings.
    4. Fasteners and anchorage systems.

E. Warranty shall not relieve Contractor of obligations under Contract Documents.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design:
    1. Element 13 or Engineer approved equal.

2.2 MATERIALS

A. Structural Framing:

1. Aluminum extrusions, alloy 6005A-T61 or 6061-T6.

B. Roof Panels:
   1. Aluminum sheet complying with ASTM B209, alloy 3003-H16.
   2. Minimum thickness: 0.050 inch.

C. Fasteners:
   1. 300-series stainless steel or compatible aluminum fasteners.
   2. Isolate dissimilar metals to prevent galvanic corrosion.

D. Anchors:
   1. 300-series stainless steel suitable for concrete embedment.

E. Sealants and Gaskets:
   1. Silicone sealant complying with ASTM C920.

2.3 ACCESSORIES

A. Flashings and Trim:
   1. Aluminum flashing of same thickness as panels.
   2. Bird screens and closures at perimeter openings.

B. Safety System:
   1. Stainless steel apex eyebolt.
   2. Stainless steel wire rope.
   3. Carabiner or approved connector.

2.4 DESIGN CRITERIA

A. General: Design roof system in accordance with NYS Building Code and ASCE 7.

B. Snow Loads:
   1. Ground snow load, Pg: **not less than 55 psf**.
   2. Roof snow load, Pf: calculated per ASCE 7 including exposure, thermal, importance, slope, and drifting.

C. Roof Live Load: Not less than **20 psf** and shall not be used in lieu of snow load.

D. Wind Loads: Design per ASCE 7 for Syracuse, NY.

E. Concentrated Load: Not less than **300 lb** for maintenance access areas.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify supporting structure is complete, level, and free of obstructions.

B. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install aluminum roof system in accordance with manufacturer's written instructions and approved shop drawings.

B. Install framing members plumb and true.

C. Install panels to provide watertight joints.

D. Install flashing, trim, and sealants to prevent water intrusion.

E. Provide anchorage as detailed.

F. Coordinate installation with equipment and access openings below roof system.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service:
   1. Engage a factory-authorized service representative to inspect aluminum roof system installation, including framing, panels, flashings, anchors, and accessories. Provide written inspection report.

B. Remove and replace roof system components that do not comply with Contract Documents.

C. Perform additional inspections and corrective work at Contractor's expense until compliance is achieved.

D. Prepare and submit inspection reports.

3.4 PERFORMANCE TESTING

A. Provide laboratory test data demonstrating compliance with ASTM requirements for:
   1. Air infiltration.
   2. Water penetration.
   3. Wind uplift resistance.

3.5 STARTUP AND DEMONSTRATION

A. Demonstrate safety line system and roof access procedures.

B. Instruct Owner in inspection and maintenance procedures.

3.6 PROTECTION

A. Protect aluminum roof system from damage during construction.

B. Replace damaged components.

END OF SECTION 07 41 13

ITEM 627.0008 25 OPENINGS

1. DESCRIPTION:

1.01 This item shall consist of furnishing all labor, materials, equipment, and services necessary to provide louvers, including flashing, fasteners, anchors, sealants, accessories, and appurtenances, in accordance with the Contract Plans and Specifications.

1.02 The work includes engineering, fabrication, delivery, installation, inspection, testing, and warranty of the louvers as shown on the Drawings and specified herein.

2. MATERIALS:

2.01 Materials shall conform to the requirements of Part 2 – Products of the Sections listed in the Specification Summary of this Item.

3. CONSTRUCTION DETAILS

3.01 Construction methods and installation procedures shall conform to the requirements of Part 3 – Execution of the Sections listed in the Specification Summary of this Item.

4. METHOD OF MEASUREMENT

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT

5.01 Payment for this item shall be made at the lump sum price bid for ITEM 627.0008 25 – Openings.

5.02 The lump sum price shall include, but not be limited to:

A. Engineering and preparation of shop drawings and structural calculations stamped and signed by a Professional Engineer licensed in the State of New York

B. Furnishing and installing aluminum roof panels and structural framing

C. Furnishing and installing anchors, fasteners, flashings, trims, closures, bird screens, and sealants

D. Furnishing and installing safety line and fall-protection anchorage system

E. Performance testing and manufacturer’s field inspection

F. Coordination with concrete structures and process equipment below the roof

G. Protection of installed work and replacement of damaged materials

H. All labor, materials, tools, equipment, and incidentals necessary to complete the work

I. Warranties required by the Specifications

5.03 Detailed Estimate:

A. Prior to the first partial payment, the Contractor shall submit a detailed estimate of quantities and prices for all work under this item, which shall total the lump sum price bid.

B. The estimate shall be in the same sequence as the Sections listed in the Specification Summary.

C. The Engineer may revise the estimate as necessary to reflect true values.

D. Progress payments shall be based on the approved detailed estimate.

6. SPECIFICATION SUMMARY

6.01 This item includes the following Specification Sections:

A. Section 08 91 16 – Operable Louvers

6.02 This item shall include, but not be limited to, the following:

A. Operable aluminum louvers

B. Shop drawings and calculations stamped by a New York State Professional Engineer.

C. Bird screens, and sealants.

SECTION 08 91 16

OPERABLE LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Metal Louvers
   2. Work includes engineering, fabrication, delivery, installation, inspection, testing, and warranty

B. Related Requirements:
   1. Section 07 41 13 ALUMINUM METAL ROOF PANELS

1.2 REFERENCES

A. Certified in accordance with the AMCA 511 Certified Ratings Program when tested in accordance with AMCA 500-L Air Performance and Water Penetration

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer's literature describing roof system components and materials.

B. Shop Drawings:
   1. Roof plan, elevations, and sections.
   2. Panel layout and joint locations.
   3. Framing member sizes and layout.
   4. Anchorage and embedment details.
   5. Flashing, penetration, and edge details.
   6. Safety line and fall-protection layout.

C. Engineering Submittals:
   1. Structural design calculations and drawings for the complete aluminum roof system.
   2. Calculations and drawings shall be prepared, stamped, and signed by a Professional Engineer licensed in the State of New York.
   3. Calculations shall demonstrate compliance with ASCE 7 and the NYS Building Code.

D. Performance Test Reports:
   1. Laboratory test data demonstrating compliance with ASTM standards for air infiltration, water penetration, and wind uplift.
   2. Manufacturer shall provide third-party verified Environmental Product Declaration specific to the submitted louver model.

E. Operation and Maintenance Manuals.

F. Warranty documentation.

1.4 QUALITY ASSURANCE

A. Manufacturers' Qualifications:
   1. Minimum ten (10) years documented experience designing and fabricating aluminum roof systems for municipal or industrial facilities.

B. Installer Qualifications:
   1. Installer shall be trained and approved by manufacturer.
   2. Installer shall have experience with similar aluminum roof systems

1.5 FABRICATION QUALITY CONTROL

A. Factory fabricate panels and framing members.

B. Maintain documented quality-control procedures for fabrication.

C. Verify dimensional tolerances prior to shipment.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original packaging.

B. Store materials off ground and protected from moisture, dirt, and damage.

C. Handle aluminum components to prevent distortion and surface damage.

1.7 WARRANTY

A. Provide manufacturer's written warranty
B. Warranty shall cover:
   1. Defects in materials and workmanship.
   2. Fasteners and anchorage systems.
C. Warranty shall not relieve Contractor of obligations under Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Greenheck ECD-401

2.2 MATERIALS

A. Frame: Louver frame shall be 4.1 inch deep channel style with 0.081 inch extruded aluminum wall thickness
B. Stationary Front Blades: drainable style located on approximately 4 inch centers and 45 degree angles with 0.081 inch extruded aluminum wall thickness
C. Operable Rear Blades: pivot style with 0.081-inch extruded aluminum wall thickness
D. Blade Seals: extruded vinyl
E. Finish: 70% Kynar Paint/100% Fluoropolymer (AAMA 2605)
F. Bird Screen: 0.75 in x 0.05 in Flat expanded aluminum bird screen
G. Actuators and controls

2.3 DESIGN CRITERIA

A. Louvers shall be designed and manufactured to withstand a minimum 25 pound per square foot wind load.
B. Free area shall not be less than 47.5%
C. Airflow resistance at 1000 feet per minute free area intake velocity shall not be greater than 0.171 inch water gauge pressure drop
D. Airflow resistance at 1000 feet per minute free area exhaust velocity shall not be greater than 0.144 inch water gauge pressure drop
E. Beginning point of water penetration shall not be less than 1018 feet per minute free area intake velocity

PART 3 - EXECUTION

3.1 INSTALLATION

A. Coordinate installation with 07 41 33 and 23 34 23

3.2 PERFORMANCE TESTING

A. Provide AMCA performance data

END OF SECTION 08 91 16

ITEM 627.0009 25 **FINISHES**

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0009 25 **FINISHES**

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 09 67 23 – RESINOUS FLOORING

B. Section 09 91 00 – PAINTING

6.02 This item shall include, but not be limited to, the following:

A. Installation of resinous flooring system as shown on the Drawings and in the Schedule.

B. Preparation of surfaces to be painted.

C. Painting of control building interior walls and ceiling in accordance with the Schedule.

D. Application of non-skid flooring per section 09 67 23

E. Painting of pipe supports.

F. Painting of new and existing conduit and pipe.

G. Application of color-coding pipes in accordance with the Schedule.

SECTION 09 67 23

RESINOUS FLOORING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the following:
   1. Resinous flooring system as shown on the drawings and in schedules.

B. Related sections include the following:
   1. Section 03 30 00 – Cast-in-Place Concrete

1.3 SYSTEM DESCRIPTION

A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious urethane based self-leveling seamless flooring system with Flintshot quartz aggregate broadcast with epoxy grout coat and urethane topcoat.

B. The system shall have the color and texture as specified by the Owner with a nominal thickness of 3/16 inch. It shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.

C. Cove base (if required) to be applied where noted on plans and per manufacturer’s standard details unless otherwise noted

1.4 SUBMITTALS

A. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.

B. Manufacturer’s Safety Data Sheet (SDS) for each product being used.

C. Samples: A 3 x 3-inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.

D. Mock-up: provide 4’x4’ to be approved in writing by owner.

1.5 QUALITY ASSURANCE

A. The Manufacturer shall have a minimum of 10 years’ experience in the production, sales, and technical support of epoxy and urethane industrial flooring and related materials.

B. The Applicator shall have experience in installation of the flooring system as confirmed by the manufacturer in all phases of surface preparation and application of the product specified.

C. No requests for substitutions shall be considered that would change the generic type of the specified System.

D. System shall be in compliance with requirements of local Health Department.

E. System shall be in compliance with the Indoor Air Quality requirements

F. A pre-installation conference shall be held between Applicator, General Contractor and the Owner for review and clarification of this specification, application procedure, quality control, inspection and acceptance criteria and production schedule.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping
   1. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.

B. Storage and Protection
   1. The Applicator shall be provided with a dry storage area for all components. The area shall be between 60 F and 85 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.
   2. Copies of Safety Data Sheets (SDS) for all components shall be kept on site for review by the Engineer or other personnel.

C. Waste Disposal
   1. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

1.7 PROJECT CONDITIONS

A. Site Requirements
   1. Application may proceed while air, material and substrate temperatures are between 60 F and 85 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
   2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
   3. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.

B. Conditions of new concrete to be coated with cementitious urethane material.
   1. Concrete shall be moisture cured for a minimum of 7 days and have fully cured a minimum of 14 days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.

2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary nor desirable).
3. Sealers and curing agents should not to be used.
4. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.

C. Safety Requirements
1. The Owner shall be responsible for the removal of foodstuffs from the work area.
2. Non-related personnel in the work area shall be kept to a minimum.

1.8 WARRANTY

A. The manufacturer shall warrant that material shipped to buyers at the time of shipment be substantially free from material defects and will perform substantially to manufacturer published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.

B. Manufacturer liability with respect to this warranty is strictly limited to the value of the material purchase. One-year standard material warranty.

PART 2 – PRODUCTS

2.1 FLOORING

A. Sherwin-Williams Poly-Crete SLB (self leveling broadcast quartz), seamless flooring system,
1. System Materials:
a. Topping: Sherwin-Williams Poly-Crete SL resin, hardener and SL aggregate.
b. The aggregate shall be Sherwin-Williams Flintshot quartz aggregate.
c. Grout coat: Sherwin-Williams Resuflor Glaze resin and hardener.
d. Topcoat: Sherwin-Williams Resutile AT resin and hardener and colorant
2. Patch Materials:
a. Shallow Fill and Patching: Use Sherwin-Williams Poly-Crete MD (up to ¼ inch).
b. Deep Fill and Sloping Material (over ¼ inch): Use Sherwin-Williams Cemlack UM.

B. Or approved equal submitted in accordance with 01 33 00.

2.2 MANUFACTURER

A. The Sherwin-Williams High Performance Flooring, 866-540-1299 swflooring@sherwin.com
Website: https://industrial.sherwin-williams.com/na/us/en/resin-flooring.html

B. Or approved equal

2.3 PRODUCT REQUIREMENTS

A. Topping: Poly-Crete SL

1.	Percent Reactive	100 %
2.	VOC	0 g/L
3.	Bond Strength to Concrete ASTM D 4541	>400 psi, substrates fails
4.	Compressive Strength, ASTM C 579	9,000 psi
5.	Tensile Strength, ASTM D 638	2,175 psi
6.	Flexural Strength, ASTM D 790	5,076 psi
7.	Impact Resistance @ 125 mils, MIL D-3134, Pass no visible damage or deterioration	

B. Grout Coat : Resuflor Glaze

1.	VOC	8 g/L
2.	Compressive Strength, ASTM D 695	17,500 psi
3.	Tensile Strength, ASTM D 638	4,000 psi
4.	Flexural Strength, ASTM D 790	6,250 psi
5.	Flexural Modulus of Elasticity, ASTM D 790	6.2×10^5
6.	Abrasion Resistance, ASTM D 4060	
	CS17 Wheel, 1,000 gm load, 1,000 cycles	24 mg loss
7.	Flame Spread/NFPA-101, ASTM E 84	Class A
8.	Flammability, ASTM D 635	Self Extinguishing
9.	Indentation, MIL D-3134	0.025 Max
10.	Impact Resistance MIL D-3134	Pass
11.	Water Absorption. MIL D-24613	0.04%

C. Topcoat: Resutile AT

1.	Percent Solids	95 %		
2.	VOC	0 g/L		
3.	Tensile Strength, ASTM D 2370	7,000 psi		
4.	Adhesion, ASTM 4541	Substrate Failure		
5.	Hardness, ASTM D 3363	>4H		
6.	60^0 Gloss ASTM D 523	Satin: 50 +/-10	Gloss: 75 +/-10	
7.	Abrasion Resistance, ASTM D4060	Gloss	Satin	
	CS 17 wheel (1,000 g load) 1,000 cycles	4	8	mg loss with grit
		10	12	mg loss without grit
8.	Pot Life, 70 F, 50% RH	45 Minutes		
9.	Full Chemical Resistance	7 days		

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.

B. Verify that substrates and conditions are satisfactory for flooring installation and comply with specified requirements.

3.2 PREPARATION

A. General
1. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
2. Moisture Testing: Perform tests recommended by manufacturer and as follows.
    a. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 99% relative humidity level measurement.
    b. If the relative humidity exceeds 99% then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.
3. Mechanical surface preparation
    a. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings, hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
    b. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
    c. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 3/16 inch deep and 1/4-inch-wide key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
    d. Cracks and joints (non-moving) greater than 1/8-inch wide are to be chiseled or chipped-out and repaired per manufacturer’s recommendations.
    e. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.3 APPLICATION

A. General
1. The system shall be applied in four distinct steps as listed below:
    a. Substrate preparation
    b. Topping/overlay application with quartz aggregate broadcast.
    c. Grout coat application.
    d. Topcoat application
2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.

5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Topping
1. The topping shall be applied as a self-leveling system as specified by the Architect. The topping shall be applied in one lift with a nominal thickness of 1/8 inch.
2. The topping shall be comprised of three components, a resin, hardener and filler as supplied by the Manufacturer.
3. The hardener shall be added to the resin and thoroughly dispersed by suitably approved mechanical means. SL Aggregate shall then be added to the catalyzed mixture and mixed in a manner to achieve a homogenous blend.
4. The topping shall be applied over horizontal surfaces using ½ inch "v" notched squeegee, trowels or other systems approved by the Manufacturer.
5. Immediately upon placing, the topping shall be degassed with a loop roller.
6. Quartz aggregate shall be broadcast to excess into the wet material at the rate of 1 lbs/sf.
7. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.

C. Grout Coat
1. The topcoat shall be squeegee applied and back rolled with a coverage rate of 80-90 sf/gal.
2. The topcoat shall be comprised of a liquid resin and a liquid hardener that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.

D. Topcoat
1. The topcoat shall be roller applied with dip and roll method at 3 mils.
2. The topcoat shall be comprised of a liquid resin, hardener and colorant mixed per the manufacturer's instructions.
3. The finish floor will have a nominal thickness of 3/16 inch.

3.4 FIELD QUALITY CONTROL

A. Tests, Inspection
1. The following tests shall be conducted by the Applicator:
   a. Temperature
      1) Air, substrate temperatures and, if applicable, dew point.
   b. Coverage Rates
      1) Rates for all layers shall be monitored by checking quantity of material used against the area covered.

3.5 CLEANING AND PROTECTION

A. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.

B. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

END OF SECTION 09 67 23

SECTION 09 91 00

PAINTING

PART 1 – GENERAL

1.01 WORK INCLUDED

A. The Contractor shall provide all labor, materials and equipment necessary to prepare and paint the following surfaces:
   1. Control building interior walls and ceilings
   2. Pipe supports, new and existing conduit and pipe including the control building and the influent pump station valve chamber
   3. All piping shall be color coded.

B. Surface preparation and shop painting of the miscellaneous metal items, wood, concrete, masonry, PVC/DI and other piping, pipe insulation and other miscellaneous materials are included under this Section.

C. Existing signage shall be removed and cleaned prior to painting and replaced after painting.

D. Wherever possible, all shop and field coatings shall be made with paints of the same manufacturer. Where this is not possible, the manufacturer, paint material and mil thickness of shop prime coatings used shall be submitted to the Engineer for approval. All shop prime coatings shall be made with paints equivalent to those specified herein. In instances where another paint manufacturer's prime coat is used, modifications to these specifications concerning preparation and painting may be necessary at no additional cost to the Owner.

E. It is the intent of this Specification to provide a completely painted or coated system for the items mentioned, but the absence of any item or coating from the said schedules shall not relieve the Contractor from painting such item completely as if it had been mentioned.

1.02 WORK NOT INCLUDED

A. The following items are not required to be painted, except as noted in this Specification or on the Contract Drawings: existing and new hand or form finished concrete surfaces, concealed copper and brass piping; galvanized surfaces; acoustic tile ceilings; non-slip stair nosing; aluminum work, stair and platform gratings, railings, louvers, and windows; curtain wall members; stainless steel; and items furnished with a factory finish equivalent to those specified herein.

1.03 INSPECTIONS AND CERTIFICATIONS

A. At the time the Contractor furnishes the name of the paint manufacturer to the Engineer for approval, he shall also submit the manufacturer's detailed program of technical and inspection services incorporating the requirements specified herein.

B. There shall be a minimum of two (2) inspections held at the job site. The Contractor shall be responsible for arranging all of these and shall notify in advance of each meeting/inspection, his painting subcontractor or painting foreman, the manufacturer's expert technical representative, and the Engineer, each of whom shall be present at each meeting/inspection.

C. At the first inspection, all conditions pertinent to surface preparation and painting shall be discussed with the Contractor. At this time an inspection of all surfaces to be painted shall be made and recommendations concerning preparation and painting shall be made by the manufacturer's representative.

D. The final inspection shall be held at the completion of all of the painting work. This inspection shall incorporate the checking and inspection of all coated surfaces. The Contractor shall correct all deficiencies found at this time in accordance with the paint manufacturer's recommendations and the Specifications in this section all work to meet the Engineer's approval.

E. At the conclusion of all the painting work as approved by the Engineer, the Contractor shall furnish a written manufacturer's certificate stating that the materials applied were found to meet the dry mil thicknesses and other requirements of this Specification.

1.04 REFERENCES

A. Society for Protective Coatings (SSPC) Specifications:

B. SSPC-PA 1: Shop, Field, and Maintenance Painting of Steel.

C. SSPC-PA-2: Measurement of Dry Coating Thickness with Magnetic Gages.

D. SSPC-SP 1: Solvent Cleaning.

E. SSPC-SP 3: Power Tool Cleaning.

F. SSPC-SP 6: Commercial Blast Cleaning.

G. SSPC-SP10: Near-White Blast Cleaning.

H. American National Standards Institute (ANSI):
   1. A13.1: Scheme for the Identification of Piping Systems, Designation.

I. National Sanitation Foundation (NSF)

1.05 QUALITY ASSURANCE

A. Use products of one manufacturer in any one paint coating system with compatible coating materials. Provide same coating product for touch-up as for original coating.

B. Do not use or retain contaminated, outdated, or diluted materials for painting. Do not use materials from previously opened containers.

C. Provide paint products having a minimum of five (5) years of service, with no peeling, flaking, chipping, blistering, or fading, under similar service conditions.

D. Apply paints and coatings using painters continuously employed in the painting profession for no less than five (5) years. Contractor’s general labor or other trade personnel shall not generally be considered to meet this criterion. If a coating system manufacturer has an

applicator/contractor certification or training program applicable to a coating system to be provided, all painters utilized shall be certified or trained in accordance therewith.

E. In the event the Contract Documents, as a whole, require differing or conflicting coatings for a particular substrate, the Engineer shall determine the most applicable coating system of those specified for such substrate. In the event similar or identical coating systems are specified in differing specifications or drawings but the number of coats is in conflict, the specified system with the highest number of coats shall be provided. In all such events, the Contractor shall have based his Bid upon the most stringent surface preparation requirements specified as applicable to the provision and installation of the coating system of the highest performance specified with the highest number of coats specified.

F. All aspects of surface preparation and coating application shall be in strict accordance with the coating manufacturer's written directions and recommendations. Written recommendations shall be deemed as being requirements.

1.06 SUBMITTALS

A. Submit the following:
1. List of coating products (Paint Schedule) with brand, type and manufacturer including dry film thickness and volatile organic compound (V.O.C.) regulations conforming to these specifications.
2. Manufacturer's current printed recommendations and data sheets for each product including performance criteria, surface preparation, application instructions.
3. Product data and pertinent information including results of test patch data indicating compatibility of field applied coatings with shop applied primers including a schedule listing each primer with field applied coatings to be applied over the primer.
4. Color samples of manufacturer's full range of colors for initial selection by Engineer.
5. Submit manufacturers' published data showing service record.
6. Submit letter(s) signed by paint manufacturer certifying that submitted products are suitable for application on the surfaces to be coated and for the service conditions.
7. Product data for mil thickness testing equipment including operating instructions.

B. Field Submittals:
1. Submit letter(s), signed by Contractor, stating that existing and new surfaces to be coated are ready for preparation as specified.
2. Submit letter(s) signed by Painting Subcontractor, certifying that existing and new surfaces to be coated have been prepared in accordance with paint manufacturer's printed instructions and are ready for field paint application.
3. Approved mil thickness test results, including location, and surface or item for identification.
4. Provide samples of existing paint coatings to paint manufacturer for identification of existing coatings. Submit to Engineer final recommendations of the paint manufacturer for the proper type of coatings that can be applied to existing surfaces. If the specified paint coating for existing surfaces is not acceptable to paint manufacturer, than then the painting subcontractor and paint manufacturer shall submit the recommended coating at no additional cost.

1.07 PAINT STORAGE AND MIXING AREAS, AND WASTE DISPOSAL

A. Store paints and painter's materials in area or areas designated by the Engineer solely for this purpose. Confine mixing, thinning, clean-up and associated operations, and storage of painting debris, to these areas before authorized disposal.

B. Do not use plumbing fixtures, piping or mechanical equipment for mixing or disposal of paint materials.
   1. Transport water to paint area by temporary hose or piping.
   2. Store waste temporarily in closed, nonflammable containers until final disposal. Keep no rubbish in painter's area for longer than 24 hours. Dispose any hazardous materials in accordance with applicable regulations and place all non-hazardous waste in the central trash trailer area.

1.08 DELIVERY, STORAGE, AND HANDLING

A. General Contractor will provide storage and protection as specified.

B. Deliver materials to painter's area in original, unbroken, containers with name and analysis of product, manufacturer's name, and shelf-life date. Do not use or retain contaminated, outdated, prematurely opened, or diluted materials.

C. Store coated items and protect the coating from damage and foreign matter, by not allowing contact with soil or pavement, exposure to wind-blown particles, or other harmful contacts which necessitate special cleaning. Use blocking during storage.

D. Protect coated items, whether prime or finish, from damage due to shipping and handling.

1.09 JOB CONDITIONS

A. Environmental Requirements:
   1. Comply with manufacturer’s printed recommendations as to environmental conditions under which coatings and coating systems can be applied.
   2. Do not apply coatings when dust is being generated.

B. Protection:
   1. Cover or otherwise protect finish work of other trades and surfaces not being painted concurrently or not to be painted.
   2. Do not paint over nameplates, tagging or other identification devices.
   3. Employ all appropriate measures to protect completed coating work during re-coat times and during cure times in accordance with manufacturer’s printed instructions and recommendations.

PART 2 – PRODUCTS

2.01 GENERAL

A. All paint and accompanying materials shall be delivered in original unopened containers bearing the manufacturer's label and all special markings and directions thereon. All paint and accompanying materials shall be used strictly in accordance with the manufacturer's recommendations, except as directed and approved in writing by the Owner or his representative.

B. Materials specified are those that have been evaluated for the specific service on this project. Products of the Tnemec Company, Inc. are listed to establish a standard of quality. Equivalent materials of other manufacturers may be submitted for approval of the Engineer.

2.02 PAINTING SCHEDULE

A. The schedule which follows includes the various items and surfaces required to be painted, the associated Finish Numbers, the types of painting materials to be used for prime, intermediate and finish coats and minimum dry film mil thickness required per coat. In general, the first material mentioned in any given painting system is a prime coat, which for prefabricated and shop-fabricated items should be applied at the shop. The remaining materials are normally field applied finish coats.

B. The intent of the Schedule is to provide a completely painted or coated system for all the work as shown on the Drawings and specified herein, but the absence of any item or surface from the Schedule shall not relieve the Contractor from the responsibility for preparing and painting such item or surface as if it had been so included in the Schedule.

C. The Painting Schedule is divided into three sub-schedules: Painting for Buildings; and Painting for Equipment and Piping. The Painting Schedule is a general or standard schedule, and all items presented may not be applicable.

PAINTING SCHEDULE

PAINTING FOR BUILDINGS

			DFT
A.	Exterior Exposed Non-Submerged Ferrous Metals,		
	1. First Coat	Tnemec Series 394 PerimePrime	2.5-3.5
	2. Second Coat	Tnemec Series V69 Hi Build Epoxoline II	3.0-4.0
	3. Finish Coat	Tnemec Series 1095 Endura-Shield	2.5-5.0
	4. Total System DFT		8.0 -12.5
B.	Interior Exposed Concrete Block		
	1. First Coat	Tnemec 130 Envirofill	applied at 60-80 sq. ft. / gal
	2. Second Coat	Tnemec Series V69 Hi-Build Epoxoline II	4.0-6.0
	3. Finish Coat	Tnemec Series V69 Hi-Build Epoxoline II	4.0-6.0
	4. Total System DFT		8.0-12.0
C.	Interior Exposed Plaster or Gypsum Wallboard		
	1. First Coat	Tnemec Series 6 Tneme-Cryl	2.0-3.0
	2. Second Coat	Tnemec Series 6 Tneme-Cryl	2.0-3.0
	3. Total System DFT		4.0-6.0
D.	Exposed Interior Structural Steel, Misc. Ferrous Metals		
	1. First Coat	Tnemec Series 394 PerimePrime	2.5-3.5
	2. Second Coat	Tnemec Series V69 Hi Build Epoxoline II	3.0-4.0
	3. Finish Coat	Tnemec Series 1095 EnduraShield	2.0-3.0
	4. Total System DFT		7.5 -10.5
E.	Exposed Interior Miscellaneous Sheet Metal		
	1. First Coat	Tnemec Series 115 UniBond DF	2.0-4.0
	2. Second Coat	Tnemec Series 115 UniBond DF	2.0-4.0
	3. Total System DFT		4.0-8.0
F.	Aluminum Imbedded in Concrete and Masonry		
	1. First Coat	Tnemec Series N69 Hi-Build Epoxoline II	3.0-5.0
	2. Second Coat	Tnemec Series 46H-413	8.0-10.0
	3. Third Coat	Tnemec Series 46H-413	8.0-10.0
	4. Total System DFT		19.0-25.0

PAINTING FOR EQUIPTMENT AND PIPING

		DFT
A. Exposed Plastic Pipe, Valves and Special Fittings		
1. First Coat	Tnemec Series V69 Hi-Build Epoxoline II	3.0-5.0
2. Second Coat	Tnemec Series V69 Hi-Build Epoxoline II	3.0-5.0
3. Total System DFT		6.0-10.0
B. Exposed Pipe Insulation		
1. First Coat	Tnemec Series 6 Tneme-Cryl	2.0-3.0
2. Second Coat	Tnemec Series 6 Tneme-Cryl	2.0-3.0
3. Total System DFT		4.0-6.0
C. Valve and Gate Stand		
1. First Coat	Tnemec Series 1 Omnithane	2.5-3.5
2. Second Coat	Tnemec Series N69 Hi-Build Epoxoline II	4.0-6.0
3. Third Coat	Tnemec Series N69 Hi-Build Epoxoline II	4.0-6.0
4. Third Coat *	Tnemec Series 73 EnduraShield	2.0-3.0
5. Total System DFT		6.5-9.5
D. Electric Switchgear, Control Centers etc. not provided with a factory finish		
1. First Coat	Tnemec Series 1 Omnithane	2.5-3.5
2. Second Coat	Tnemec Series 1028 Enduratone	2.0-3.0
3. Third Coat	Tnemec Series 1028 Enduratone	2.0-3.0
4. Total System DFT		6.5-9.5
E. Heating and Ventilating Equipment.		
1. First Coat	Tnemec Series 10	2.5-3.5
2. Second Coat	Tnemec Series 82 Versatone	1.5-2.5
3. Third Coat	Tnemec Series 82 Versatone	1.5-2.5
4. Total System DFT		5.5-8.5
F. Non-Submerged Ferrous Metal Subject to Moisture and Condensation - Especially on surfaces which will be constantly wet		
1. First Coat	Tnemec Series 1 Omnithane	2.5-3.5
2. Second Coat	Tnemec Series N69 Hi-Build Epoxoline II	4.0-6.0
3. Third Coat	Tnemec Series N69 Hi-Build Epoxoline II	4.0-6.0
4. Total System DFT		6.5-9.5

NOTE: All components that are shopped primed with a manufacturers primer that is different from what is specified above must undergo adhesion testing in accordance to ASTM 3359 Standard Test Method for Measuring Adhesion by Tape Test. All coats in the specified system must be applied to the test patch in order to conduct the overcoat analysis.

2.02 PIPE, VALVE/EQUIPMENT IDENTIFICATION AND COLOR CODING:

A. Provide identification of existing and new pipes, valves, pumps, tanks and similar vessels and items in accordance with Owner's Identification System which prescribes specific background colors, text colors, directional arrow colors, banding, and other unique identifiers. Colors required by Owner to match Owner's Identification System shall be provided at no additional cost, regardless of whether or not a color may be considered "custom" by the paint manufacturer.
   1. For existing and new pipe systems, use stenciled letters and arrows or self-adhesive labels or tapes located at intervals no greater than 20 ft. apart on straight runs except that stainless steel piping at intervals shall be no greater than 15 ft. apart on straight runs. Mark each valve, branch, wye change in direction and each side of floor and wall penetrations.
      a. Labels or tapes shall be moisture and U.V. resistant.

B. Provide legend of size, character and location conforming to ANSI A13.1 for stenciled letters or labels.

PART 3 – EXECUTION

3.01 WORKMANSHIP, SAFETY AND CLEAN-UP

A. All work shall be done in a workmanlike manner so that the finished surfaces will be free from runs, drops, ridges, waves, laps, and unnecessary brush marks. All coats shall be applied in such a manner as to produce an even film of uniform thickness completely coating all corners and crevices. All painting shall be done by thoroughly experienced workmen in full conformance with the manufacturer's recommendations.

B. Succeeding coats of the same type and/or color of paint shall vary sufficiently from the color of the preceding coat to permit ready identification. Primers and intermediate coats shall be retouched before applying the succeeding coat.

C. The application of paint or surface drainage coating to any surface shall signify the acceptance by the Contractor of the surfaces to be finished, and any defects in the finished painting work due to defects in the surface to be painted or finished shall be corrected by the Contractor at no additional expense to the Owner.

D. The Contractor shall use particular care in preparing and painting those surfaces of metals which are subject to submergence or intermittent submergence, but which are not easily accessible or visible after erection or placement.

E. Proper safety precautions shall be taken at all times in enclosed areas as well as open areas. Masks for painters may be necessary and forced ventilation inside tanks and enclosed areas must be provided, not only to protect the painters from prolonged breathing of the volatile solvents but also to facilitate the proper setting and hardening of the paint coatings. All safety precautions necessary, including those required by law, shall be included under this Section and are the responsibility of the Contractor.

F. After the painting work is completed and dry, the Contractor shall go over all doors and sash and

loosen any that may have become stuck, leaving same and all other work free from any defects caused by the painting. All paint spots, daubs, etc., shall be removed from glass, hardware, piping equipment, etc., which may have become spotted as a result of the painting work. Upon completion of the painting and finishing work, all surplus materials, empty packages, debris and the like, shall be removed from the building and the premises.

G. To provide contrast between successive coats, lightly tint each coat to distinguish it from preceding coats.

H. Unless otherwise indicated for finish paint, use gloss or semi-gloss on metal, and satin finish on masonry and concrete.

3.02 RATES OF APPLICATION

A. On metal surfaces, the painter shall apply each coat of paint at the rate specified by the manufacturer to achieve the minimum dry mil thickness required. If material has thickened or must be diluted for application by spray gun, the coating shall be built up to the same film thickness achieved with undiluted material. In other words, one gallon of paint as originally furnished by the manufacturer must not cover a greater square foot area when applied by spray gun than when applied untinned by brush. Deficiencies in film thickness and/or the continuity of the coatings shall be corrected by application of an additional coat(s) of paint.

B. On masonry, application rates will vary according to surface texture, however, in no case shall the manufacturer's stated coverage rate be exceeded. On porous surfaces, it shall be the painter's responsibility to achieve a protective and decorative finish either by decreasing the coverage rate or by applying additional coats of paint.

C. All thicknesses referred to in the painting schedule are dry mil measurements. Mil thickness shall, in all cases, take precedence over number of coats to obtain proper coverage.

3.03 PAINTING RESTRICTIONS DURING BAD WEATHER, LOW TEMPERATURE AND OTHER ATMOSPHERIC CONDITIONS

A. No paint shall be applied when the surrounding air temperature, as measured in the shade, is below 40°F (50°F for two-component epoxies including coal tar epoxies; for emulsions, follow manufacturer's instructions on containers). Paint shall not be applied in rain, snow, fog or mist, or when the relative humidity exceeds 85%. No paint shall be applied when it is expected that the relative humidity will exceed 85% or that the air temperature will drop below 40°F within 18 hours after the application of the paint. Dew or moisture condensation should be anticipated, and if such conditions are prevalent, painting shall be delayed until midmorning to be certain that the surfaces are dry. Further, the day's painting should be completed well in advance of the probable time of day when condensation will occur, in order to provide an appreciable drying time prior to formation of moisture.

3.04 DRYING TIMES

A. Drying time shall be construed to mean "under normal conditions." Where conditions are other than normal because of the weather or because painting must be done in confined spaces, longer drying times will be necessary.

B. Additional coats of paint shall not be applied, nor shall units be handled, moved, or put into service until paints are thoroughly dry.

3.05 STORING AND MIXING

A. All materials used in paint application shall be stored and mixed in a single well-ventilated place and in a manner to prevent spontaneous combustion and contamination by extraneous materials. No plumbing fixture or pipe shall be used for mixing or for disposal of any waste paint, solvents, or other refuse material. Waste rags, etc., shall be removed daily. All materials shall be stored, mixed and used at the temperatures recommended by the paint manufacturer. Paint and solvent containers shall be kept tightly closed when not being actually used and shall remain unopened until required for use. Paint which was livered, gelled, or otherwise deteriorated during storage shall not be used. All containers of paint shall be clearly labeled to show paint identification, date of manufacture, batch number, order number and special instructions, all legible at the time of use.

3.06 SURFACE PREPARATION

A. All surfaces to be painted shall be thoroughly cleaned by removing dirt, rust scale, rust, loose mill scale, welding flux and slag, oil, tar asphalt, grease, laitance, loose paint and other detrimental matter which may interfere with the proper adhesion of the coating to be applied all per the manufacturer's recommendations.

B. For existing interior coatings the surface needs to be prepared in accordance to SSPC-SP 1 and SSPC-SP 2 or SSPC-SP 3. Tightly adhered rust, mill scale or previous coating can remain provided it cannot be removed by lifting with a dull putty knife using moderate pressure. This applies to all existing painted surfaces to be recoated under this contract.

C. Rust on existing exterior ferrous surfaces in the Exterior Sludge Dumpster Area shall be removed by first chemical cleaning the area and then by power tool cleaning/wire brushing per SSPC-SP3 standards and the area reprimed.

D. All surfaces shall be free from wetness, dampness, frost and ice before any coating is applied. Surfaces shall be thoroughly dry before painting. No painting shall be done until the surface to which paint is applied has been approved by the Engineer.

E. Hardware, accessories, equipment, piping, machine surfaces, plates, lighting fixtures, and similar items in place prior to cleaning and painting, and not intended to be painted, shall be removed or masked during painting operation and repositioned upon completion of each area or shall otherwise be protected.

F. Cleaning and painting shall be so programmed that dust and other contaminates from the cleaning process will not fall on wet, newly painted surfaces. The Contractor shall not only protect his work at all times but shall also protect all adjacent work and materials during the progress of his work. Upon completion of work, he shall clean-up all paint spots, oil and stains from floors, glass, hardware, etc.

3.08 SURFACE PREPARATION FOR NEW GALVANIZED AND NON-FERROUS METALS

A. All non-ferrous metals, whether to be shop or field primed, shall be cleaned with an approved

solvent prior to the application of primer. Prepare Surfaces in accordance to SSPC SP 7 Brush-Off Blast Cleaning. Reference ASTM 6386.

3.09 PVC PIPE

A. Sand all surfaces with 60-80 grit paper to provide profile to adhere coatings.

3.10 PROTECTION

A. All finished work and equipment, machinery and apparatus shall be properly protected from damage or defacement, and all damage or defacement thereto shall be made good by the Contractor in an approved manner, at no additional expense to the Owner. Floors, equipment, machinery, apparatus and similar items shall be covered with heavy building paper or cloth properly secured in place. The various rooms and spaces of the building where painting and finishing is going on shall be protected against dust, as far as practicable, until the freshly painted surfaces have thoroughly dried. At the time of acceptance of the buildings and facilities the painting and finishing work must be in a neat and undamaged condition.

END OF SECTION 09 91 00

ITEM 627.0023 25 **HVAC**

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0023 25 **HVAC**

6. **SPECIFICATION SUMMARY**

6.01 This Item includes the following specifications:

A. Section 23 34 23 – DIRECT DRIVE SIDE WALL MOUNTED PROPELLER FAN

6.02 This item shall include, but not be limited to, the following:

A. Furnish and install Trickling Filter Exhaust Fan and associated electrical wiring and control switches.
B. Furnishing and installing anchors, fasteners, flashings, trims, closures, and sealants
C. Coordination with roof construction
D. Protection of installed work and replacement of damaged materials
E. All labor, materials, tools, equipment, and incidentals necessary to complete the work
F. Warranties required by the Specifications

SECTION 23 34 23

DIRECT DRIVE SIDEWALL MOUNTED PROPELLER FAN

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: HVAC Power Ventilators
B. Related Sections:
1. 01 33 00 SUBMITTAL PROCEDURES
2. 07 41 13 ALUMINUM METAL ROOF PANELS
3. 08 91 19 OPERABLE LOUVERS
4. 26 00 00 ELECTRICAL

1.2 REFERENCES

A. Air Movement and Control Association Inc. (AMCA):
B. American National Standards Institute/Air Movement and Control Association Inc. (ANSI/AMCA Standard):
C. American National Standards Institute (ANSI):
D. American Society of Civil Engineers (ASCE):
E. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE):
F. American Society for Testing and Materials (ASTM):
G. National Fire Protection Association (NFPA):
1. 70 - National Electrical Code
2. 90A-02 - Standard for the Installation of Air-Conditioning and Ventilating Systems
3. 92A-06 - Recommend Practice for Smoke-Control System
4. 92B-05 - Standard for Smoke Management System in Malls, Atria, and Large Areas
5. 96-04 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
H. Occupational Safety and Health Administration (OSHA):
1. 1910.212 - General requirements for Machine Guarding
2. 1910.219 - General requirements for guarding safe use of mechanical power transmission apparatus
3. 1926.300 - General requirements for safe operation and maintenance of hand and power tools
I. Underwriters Laboratories (UL):
1. 507 – Electric Fans
2. 555 – Fire Dampers
3. 555S – Smoke Dampers
4. 705 – Standard Power Ventilators
5. 705 – Supplement SC - Standard Power Roof Ventilators for Restaurant Exhaust Appliances
6. 793 – Snow Load

1.3 SUBMITTALS

A. General: Submit in accordance with Section 01 33 00 Submittal Procedures.
B. Provide dimensional drawings and product data for each fan.

C. Provide fan curves for each fan at the specified operation point, with the flow, static pressure and horsepower clearly plotted.
D. Provide outlet velocity and fan's inlet sound power readings for the eight octave bands, decibels, and sones.
E. Strictly adhere to QUALITY ASSURANCE requirements as stated in section 1.4 of this specification.
F. Provide manufacturer's certification that supply and exhaust fans are licensed to bear Air Movement and Control Association (AMCA), Certified Rating Seal for FEI, Sound and Air Performance.
G. Provide fan FEI value on design documents and product submittals when operating power is greater than or equal to 1 hp.
H. Installation, Operation, and Maintenance Manual (IOM): Provide manufacturer's installation, operations, and maintenance manual, including instructions on installation, operations, maintenance, receiving, handling, storage, safety information and cleaning. A troubleshooting guide, parts list, warranty and electrical wiring diagrams.

1.4 QUALITY ASSURANCE

A. Performance ratings: Conform to AMCA standard 211 and 311. Fans must be tested in accordance with ANSI/AMCA Standard 210-16 and AMCA Standard 300-14 in an AMCA accredited laboratory. Fans shall be certified to bear the AMCA label for sound, air, and FEI performance seal.
B. Fans shall have a Fan Energy Index (FEI) rating that meets or exceeds requirements of the latest edition of ASHRAE 90.1.
C. Classification for Spark Resistant Construction, levels B and C, conform to AMCA 99.
D. Each fan propeller is balanced to meet a balance grade of G6.3.
E. Comply with the National Electrical Manufacturers Association (NEMA), standards for motors and electrical accessories.
F. The Finite Element Analysis (FEA) is the results from the CFD and it can accurately predict the stress, strain, and deflection resulting from high wind loads.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly indicating manufacturer, material, products included, and location of installation.
B. Storage: Store materials in a dry area indoor, protected from damage, and in accordance with manufacturer’s instructions. For long term storage follow manufacturer's Installation, Operations, and Maintenance Manual.
C. Handling: Handle and lift fans in accordance with the manufacturer’s instructions. Protect materials and finishes during handling and installation to prevent damage. Follow all safety warnings posted by the manufacturer.

1.6 WARRANTY

A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
B. The warranty of this equipment is to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during

the warranty period will be replaced at the Manufacturers option when returned to Manufacturer, transportation prepaid.

C. Motor Warranty is warranted by the motor manufacturer for a period of one year. Should motors furnished by us prove defective during this period, they should be returned to the nearest authorized motor service station.

1.7 MAINTENANCE

A. Refer to Manufacturer's Installation, Operation and Maintenance Manual (IOM), to find maintenance procedures.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Greenheck, PO Box 410, Schofield, Wisconsin 54476
Phone: (715) 359-6171 Fax: (715)355-2399 Website: www.greenheck.com

2.2 DIRECT DRIVE SIDEWALL MOUNTED PROPELLER FAN - GREENHECK MODEL AER-24

A. General Description:

1. Fan arrangement shall be exhaust
2. Sidewall mounted applications.
3. Performance capabilities 8,500 cubic feet per minute (cfm)
4. Maximum continuous operating temperature 150° Fahrenheit (65° Celsius) with appropriate motor selection.
5. Minimum continuous operating temperature -10° Fahrenheit (-23° Celsius).
6. Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model number and individual unit serial number.

B. Propeller:

1. Constructed of: Fabricated Steel
2. Securely attached to motor shaft with a standard square key, set screw and tapered bushing.
3. Statically and dynamically balanced in accordance with AMCA Standard 204-05.
4. The propeller and fan inlet will be aligned and shall have precise running tolerances for maximum performance and operating efficiency.

C. Motor: AC Induction Motor

1. Motor Enclosure: Explosion Resistant Enclosure
2. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase.
3. NEMA Rated: 7&9
4. Positive electrical shut-off.
5. Wired from fan motor to junction box.

A. Options/Accessories:

1. Closure Angles:
   a. Set of mounting flanges shall be available for field installation to close off the interior wall opening for a finished appearance.
2. Damper:
   a. Type: Gravity
   b. Prevents outside air from entering back into the building when fan is off.
   c. Balanced for minimal resistance to flow.

d. Galvanized frames with pre-punched mounting holes.

3. Damper Guard:
   a. Guard Frame Material: Aluminum
   b. Shall completely enclose the damper or wall opening on the discharge side of the fan.
4. Finishes:
   a. Type: Permatector
5. Horizontal Mounting:
   a. Allows fan to be mounted in a horizontal configuration.
   b. Location: Motor Top, Air Down
6. Wall Housing:
   a. Mounting arrangement: Flush Exterior
   b. Constructed of galvanized steel or painted steel with heavy gauge mounting flanges and pre-punched mounting holes.
   c. Housing shall include OSHA approved motor guard.
   d. Reduces installation time and provides maximum installation flexibility.
7. Wall Collar:
   a. Constructed of galvanized steel or painted steel with heavy gauge mounting flanges and pre-punched mounting holes.
8. Motor Side Guard:
   a. Guard Type: OSHA Approved
   b. Protective guard of expanded metal screen in structural steel frames completely enclose the motor and drive side of the fan.
9. Propeller Guard:
   a. Guard Type: OSHA Approved
   b. Constructed of coated steel.
   c. Protective guard completely enclose the propeller side of the fan.
10. Weatherhood Kit:
   a. Shall shield wall opening and dampers from rain and snow.
   b. Frame Material Type: Aluminum
   c. Turndown Angle: 90 degrees
   d. Screen: Insect Screen
   e. Finishes: Permatector

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog installation instructions.

3.2 EXAMINATION

A. Examine areas to receive fans. Notify the Engineer of conditions that would adversely affect installation or subsequent utilization and maintenance of fans. Do not proceed with installation until unsatisfactory conditions are corrected.

3.3 PREPARATION

A. Ensure roof openings are square, accurately aligned, correctly located, and in tolerance.
B. Ensure duct is plumb, sized correctly, and to proper elevation above roof deck. Install duct as specified in Air Distribution (Division 23).

3.4 INSTALLATION

A. Install fans system as indicated on the Installation, Operation and Maintenance Manual (IOM) and contract drawings.
B. Install fans in accordance with manufacturer's instructions.

3.5 SYSTEM STARTUP

A. Refer to Installation, Operation, and Maintenance Manual (IOM).

3.6 CLEANING

A. Clean as recommended by manufacturer. Do not use material or methods which may damage finish surface or surrounding construction.

3.7 PROTECTION

A. Protect installed product and finished surfaces from damage during construction.
B. Protect installed fans to ensure that, except for normal weathering, fans will be without damage or deterioration at time of substantial completion.

END OF SECTION 23 34 23

ITEM 627.0026 25 **ELECTRICAL**

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0026 25 **ELECTRICAL**

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

B. Section 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

C. Section 26 05 33 – RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

D. Section 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

E. Section 26 28 16 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

6.02 This item shall include, but not be limited to, the following:

A. Furnish and install enclosed non-fusible switches and molded-case circuit breakers, complete with properly rated enclosures, accessories, labeling, and field testing in accordance with NFPA and NEMA requirements.

B. Provide low-voltage copper conductors and cables for feeders and branch circuits, including pulling, terminating, splicing, and testing in approved raceways with proper color-coding and identification.

C. Install complete grounding and bonding systems, including grounding conductors, bus bars, connectors, and exothermic welds, to ensure electrical safety and code compliance.

D. Furnish and install metallic and nonmetallic raceways, fittings, wireways, boxes, cabinets, and enclosures suitable for indoor, outdoor, damp, and hazardous locations as indicated.

E. Coordinate raceway layouts with building structure and equipment, including supports, bends, terminations, sealing fittings, and protection against moisture, vibration, and physical damage.

F. Provide complete identification for electrical systems, including conductor color-coding, underground warning tape, engraved equipment labels, and safety signage.

G. Perform required inspections, adjustments, and acceptance testing of electrical equipment, conductors, and grounding systems in accordance with NETA and NFPA standards.

H. Submit product data, shop drawings, coordination information, and operation and maintenance documentation for all electrical components and systems installed.

I. Provide and install sleeves and sleeve seals at wall and floor penetrations for electrical

raceways, ensuring watertight and code-compliant transitions through building assemblies.

J. Select and install enclosures and raceway systems with appropriate environmental and hazardous-location ratings (e.g., NEMA Types 1, 4X, 7/9) based on indoor, outdoor, wet, or classified area conditions

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

A. Section 26 05 33 – Raceways and Boxes for Electrical Systems.

B. Section 26 05 53 – Identification for Electrical Systems.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

B. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN-2-THWN-2, Type XHHW-2, and Type SO.

C. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for Type SO with ground wire.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION & MULTICONDUCTOR CABLE APPLICATIONS & WIRING METHODS

A. Feeders: Type THHN-2-THWN-2 or XHHW-2, single conductors in raceway. Use Type THHN-2-THWN-2 for feeders smaller than No. 2 AWG, use Type XHHW-2 for feeders No. 2 AWG and

larger.

B. Branch Circuits: Type THHN-2-THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS & CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. The use of NM cable is prohibited.

C. Complete raceway installation between conductor and cable termination points according to Section 26 05 33 – Raceways and Boxes for Electrical Systems prior to pulling conductors and cables.

D. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

E. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

F. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
   1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 26 05 53 – Identification for Electrical Systems.

B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.6 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

END OF SECTION 26 05 19

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

A. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors: Size conductors per NFPA 70, unless noted otherwise.
   1. Solid Conductors: ASTM B 3.
   2. Stranded Conductors: ASTM B 8.
   3. Tinned Conductors: ASTM B 33.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.2 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression -type wire terminals, and long-barrel, two-bolt connection to ground bus bar**.**

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install a solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG

minimum.

1. Bury at least 24 inches below grade.
2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

END OF SECTION 26 05 26

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DEFINITIONS

A. GRC: Galvanized rigid steel conduit.

1.2 RELATED REQUIREMENTS

A. Section 26 05 53 – Identification for Electrical Systems

B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. GRC: Comply with ANSI C80.1 and UL 6.

C. EMT: Comply with ANSI C80.3 and UL 797.

D. FMC: Comply with UL 1; zinc-coated steel.

E. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
   2. Fittings for EMT:
      a. Material: Steel.
      b. Type: Setscrew or compression.
   3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

G. Joint Compound for GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

C. Wireway Covers: Hinged type unless otherwise indicated.

D. Finish: Manufacturer's standard enamel finish.

2.3 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.

C. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

H. Box extensions used to accommodate new building finishes shall be same material as recessed Box.

I. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep.

J. Gangable boxes are allowed.

K. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
   1. Nonmetallic Enclosures: Plastic.
   2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

L. Cabinets:
   1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
   2. Hinged door in front cover with flush latch and concealed hinge.
   3. Key latch to match panelboards.
   4. Metal barriers to separate wiring of different systems and voltage.
   5. Accessory feet where required for freestanding equipment.
   6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed Conduit: GRC.
   2. Concealed Conduit, Aboveground: GRC.
   3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
   4. Boxes and Enclosures, Aboveground: NEMA 250, Type 4X.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:
   1. Exposed, Not Subject to Physical Damage: EMT.
   2. Exposed and Subject to Physical Damage: GRC. Raceway locations include the following:
      a. Mechanical rooms and utility rooms.
   3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
   4. Damp or Wet Locations: GRC .
   5. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4X nonmetallic in kitchens and damp or wet locations.

C. Minimum Raceway Size: 1/2-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. GRC: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
   2. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.

3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Arrange stub-ups so curved portions of bends are not visible above finished slab.

E. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

F. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines. Do not install EMT in grout.

G. Support conduit within 12 inches of enclosures to which attached.

H. Exposed conduit in finished areas is not permitted.

I. Raceways Embedded in Slabs:
1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 1-inch of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by the Authority’s Representative for each specific location.

J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

O. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

Q. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

R. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of heated spaces.
   2. Where an underground service raceway enters a building or structure.
   3. Where otherwise required by NFPA 70.

S. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

T. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
   1. Use LFMC in damp or wet locations subject to severe physical damage.
   2. Use LFMC in damp or wet locations not subject to severe physical damage.

U. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated.

V. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a

raintight connection between box and cover plate or supported equipment and box.

W. Horizontally separate boxes mounted on opposite sides of walls, so they are not in the same vertical channel.

X. Locate boxes so that cover or plate will not span different building finishes.

Y. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

Z. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.4 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 QUALITY ASSURANCE

A. Comply with ANSI A13.1.

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.2 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustic ceilings and similar concealment.

1.3 RELATED REQUIREMENTS

A. Section 09 91 00 – Painting.

PART 2 - PRODUCTS

2.1 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Write-On Tags: Polyester tag, 0.015-inch-thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.

2.2 UNDERGROUND-LINE WARNING TAPE

A. Tape:
1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.
3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.
4. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, compounded for direct-burial service.
5. Overall Thickness: 5 mils.
6. Foil Core Thickness: 0.35 mil.
7. Weight: 28 lb/1000 sq. ft.
8. 3-Inch Tensile According to ASTM D 882: 70 lbf, and 4600 psi.

B. Color and Printing:
1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE.

2.3 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

B. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1-inch.

2.4 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in Section 09 91 00 – Painting for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive with mechanical fasteners appropriate to the location and substrate.

F. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

G. Painted Identification: Comply with requirements in Section 09 91 00 – Painting for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
   1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
      a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
      b. Colors for 120/208V Three Phase Circuits:
         1) Phase A: Black
         2) Phase B: Red
         3) Phase C: Blue
         4) Neutral: White
      c. Colors for 120/240 V single phase circuits:
         1) Line 1: Black
         2) Line 2: Red
         3) Neutral: White
      d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

B. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.

C. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.

D. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual, unless equipment is provided with its own identification.
   1. Labeling Instructions:
      a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.

b. Outdoor Equipment: Engraved, laminated acrylic or melamine label or Stenciled legend 4 inches high.
c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
d. Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

END OF SECTION 26 05 53

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Nonfusible switches.
   2. Molded-case circuit breakers (MCCBs).
   3. Enclosures.

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
   1. Enclosure types and details
   2. Current and voltage ratings.
   3. Short-circuit current ratings (interrupting and withstand, as appropriate).
   4. Include evidence of a nationally recognized testing laboratory (NRTL) listing for series rating of installed devices.
   5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

6. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in electronic format.

E. Shop Drawings: For enclosed switches and circuit breakers.
1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

F. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

G. Qualification Data: For qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals.
1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in electronic format.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.
1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
2. Altitude: Not exceeding 6600 feet.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Source Limitations: Where possible, obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

D. Comply with NFPA 70.

2.2 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Schneider Electric USA (Square D).
   2. Eaton.
   3. Or equal.

B. Type GD, General Duty, Three Pole, Single Throw, 240-V ac, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

D. Type HD, Heavy Duty, Three Pole, Double Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

E. Motor-Starting Switches: “Quick-make, quick-break" toggle or push-button action; marked to show whether unit is off or on.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Hubbell Killark
      b. Square D; a brand of Schneider Electric.
      c. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
   2. Type: Heavy Duty, NEMA 3/7/9, rated for CIDII environments
   3. Configuration: 1-pole, 2-pole, or 3-pole, Non-reversing. Refer to construction package for specifics on each device
   4. Mounting: Refer to construction package equipment schedules for specifics on each device.
   5. Pilot Light: Refer to construction package equipment schedules for specifics on each device.

F. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

3. Auxiliary Contact Kit: One NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating - 24-V ac.
4. Hookstick Handle: Allows use of a hookstick to operate the handle.
5. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.3 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. Schneider Electric USA (Square D).
2. Eaton.
3. Or equal.

B. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

C. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

D. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated or series rated as indicated on the Drawings. Circuit breaker/circuit breaker combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations. Any series rated combination used shall be marked on the end-use equipment along with the statement "Caution - Series Rated System. _____ Amps Available. Identical Replacement Component Required."

E. MCCBs shall be capable of being locked in the isolated position.
1. Provide a device capable of locking MCCB as noted on panelboard schedules in the construction package.

F. Lugs shall be suitable for 140 deg F rated wire on 125-A circuit breakers and below.

G. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.

H. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

I. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller, and let-through ratings less than NEMA FU 1, RK-5.

J. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker and trip activation on fuse opening or on opening of fuse compartment door.

K. Ground-Fault Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).

L. Ground-Fault Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).

M. Features and Accessories:
1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.
6. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
7. Auxiliary Contacts: One SPDT switch with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
8. Alarm Switch: One NO contact that operates only when circuit breaker has tripped.
9. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
10. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.
11. Electrical Operator: Provide remote control for on, off, and reset operations.
12. Accessory Control Power Voltage: Integrally mounted, self-powered; 24-V ac.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

D. Operating Mechanism: The circuit-breaker operating handle shall be directly operable through the front cover of the enclosure (NEMA 250 Type 1). The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

F. NEMA 250 Type 7/9 enclosures shall be furnished with a breather and drain kit to allow their use in outdoor and wet location applications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Director’s Representative or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
   1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of electric service.
   2. Indicate method of providing temporary electric service.
   3. Do not proceed with interruption of electric service without Construction Manager's written permission.
   4. Comply with NFPA 70E.

3.3 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.
   1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
   2. Outdoor Locations: NEMA 250, Type 3R and 4X, stainless steel
   3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
   4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.
   5. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7/9.

3.4 INSTALLATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

C. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

D. Install fuses in fusible devices.

E. Comply with NFPA 70 and NECA 1.

3.5 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.

B. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Director's Representative will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a Company Service Advisor to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections.

E. Tests and Inspections for Switches:
1. Visual and Mechanical Inspection:
    a. Inspect physical and mechanical condition.
    b. Inspect anchorage, alignment, grounding, and clearances.
    c. Verify that the unit is clean.
    d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
    e. Verify that fuse sizes and types match the Specifications and Drawings.
    f. Verify that each fuse has adequate mechanical support and contact integrity.
    g. Inspect bolted electrical connections for high resistance using one of the two following methods:
        1) Use a low-resistance ohmmeter.
            a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
        2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
            a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
i. Verify correct phase barrier installation.
j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

2. Electrical Tests:
   a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
   c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
   d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
   e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

F. Tests and Inspections for Molded Case Circuit Breakers:
   1. Visual and Mechanical Inspection:
      a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
      b. Inspect physical and mechanical condition.
      c. Inspect anchorage, alignment, grounding, and clearances.
      d. Verify that the unit is clean.
      e. Operate the circuit breaker to ensure smooth operation.
      f. Inspect bolted electrical connections for high resistance using one of the two following methods:
         1) Use a low-resistance ohmmeter.
            a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
         2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
            a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
      g. Inspect operating mechanism, contacts, and chutes in unsealed units.
      h. Perform adjustments for final protective device settings in accordance with the coordination study.
   2. Electrical Tests:

a. Test functionality of the trip unit by means of primary current injection. Pickup values and trip characteristics shall be as specified and within manufacturer's published tolerances.
b. Verify correct operation of auxiliary features such as trip and pickup indicators; zone interlocking; electrical close and trip operation; trip-free, anti-pump function; and trip unit battery condition. Reset all trip logs and indicators. Investigate units that do not function as designed.
c. Verify operation of charging mechanism. Investigate units that do not function as designed.

3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

G. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

H. Prepare test and inspection reports.
1. Test procedures used.
2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
3. List deficiencies detected, remedial action taken, and observations after remedial action.

3.7 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges to values indicated on the Drawings.

END OF SECTION 26 28 16

ITEM 627.0028 25 ELECTRONIC SAFETY AND SECURITY

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0028 25 ELECTRONIC SAFETY AND SECURITY

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 28 46 00 – CONVENTIONAL FIRE ALARM AND DETECTION SYSTEM

6.02 This item shall include, but not be limited to, the following:

A. Furnish and install new manual fire alarm system in the pump house and miscellaneous building on site as shown on the Drawings and per Specifications.

B. Provide new FACP located in the pump house

C. Perform preliminary and final 100% acceptance testing on all new and existing devices and appliances; submit NFPA 72 acceptance test documentation

SECTION 28 46 00

CONVENTIONAL FIRE ALARM AND DETECTION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes electric power supplies, initiating devices, notification appliances, installation, software programming, acceptance testing and certification for fire alarm and detection system. The entire system shall be installed in conformance with codes, standards and regulations as indicated below.

B. This specification is intended for a contractor with competence and experience in the installation of fire protection systems. These life safety systems are expected to successfully operate under adverse conditions. Adequate installation will result in code compliance, trouble-free service, and reasonable protection of occupants and property from fire.

C. In commercial and multiple family dwellings, fire alarm, detection systems must undergo maintenance in accordance with NFPA 72 and the Fire Code of New York State.

1.2 REFERENCED CODES AND STANDARDS

A. Building Code of New York State (2025 Edition)

B. Fire Code of New York State (2025 Edition)

C. NFPA 70, National Electrical Code (2026 edition)

D. NFPA 72, National Fire Alarm and Signaling Code (2025 edition)

E. UL 864, Standard for Control Units and Accessories for Fire Alarm Systems (10th Edition)

F. NFPA 170, Standard for Fire Safety and Emergency Symbols (2024 Edition)

G. FM Loss Prevention Data Sheet 5-40, Fire Alarm Systems (September 2007)

H. NICET (National Institute for Certification in Engineering Technologies) – Fire Protection Engineering Technology, Fire Alarm Systems Program Detail Manual

I. Underwriters Laboratories, Inc. (UL) Fire Protection Equipment Directory (2025 Edition)

J. NYS Department of State Division of Licensing Services, Business of Installing, Servicing or Maintaining Security or Fire Alarm Systems, Article 6-D, General Business Laws

K. Equipment manufacturers written installation instructions and data sheets.

1.3 PROJECT DESCRIPTION

A. Provide new manual fire alarm system in the pump house and miscellaneous building on site as shown on the Drawings and as specified in this Section.

B. A new FACP will be provided in this project and be located in the pump house.

C. Perform preliminary and final 100% acceptance testing on all new and existing devices and appliances; submit NFPA 72 acceptance test documentation.

1.4 SUBMITTALS

A. Submittals shall be prepared by a NICET Level 3 or Level 4 fire alarm layout technician. Submittals shall bear the technician's NICET certification number.

B. Equipment: Submit all fire alarm equipment specified in this section for review and approval by the project fire protection engineer.

C. A PE seal on submittals is not required or desired.

D. Fire Alarm Shop Drawings: Submit shop drawings which contain the following:

1. A floor plan that indicates the use of all rooms.
2. Locations of alarm-initiating devices.
3. Locations of alarm notification appliances, including candela ratings for visible appliances and sound pressure level setting for audible appliances.
4. Design minimum audibility level for occupant notification.
5. Location of fire alarm control unit, transponders and notification power supplies.
6. Annunciators.
7. Power connection.
8. Battery calculations.
9. Conductor type and sizes.
10. Voltage drop calculations.
11. Manufacturers' data sheets indicating model numbers and listing information for equipment, devices and materials.
12. Details of ceiling height and construction.
13. The interface of fire safety control functions.
14. Classification of the supervising station.
15. Locations of smoke compartments

E. Any contractor-proposed deviations from this specification shall be reviewed and accepted by the project fire protection engineer and the owner prior to installation. The owner may elect to accept 'value engineering' with approved credit at his discretion.

1.5 CLOSEOUT SUBMITTALS

A. Project Record ("As-built") Documents: Submit drawings depicting locations of devices, appliances and other equipment as installed, final power supply and standby power calculations, and approved equipment submittals.

1.6 QUALIFICATIONS

A. Fire Protection Equipment Manufacturer: Company(ies) shall specialize in manufacturing listed products specified in this section

B. Installer: Licensed by the New York State Division of Licensing Services

C. System layout and installation shall be under the direct supervision of a NICET Level 3 or Level 4 certified technician engaged by the installer.

1.7 EXTRA MATERIALS

A. As part of base bid, include an allowance for the following equipment including materials, labor to install:

1. One (1) fire alarm manual pull stations
2. One (1) notification appliance
3. Two (2) fuses for each fused circuit
4. One (1) Smoke detector

B. Adjust voltage drop and power supply calculations for addition of devices and appliances.

C. At the conclusion of the project, the Owner shall receive a credit for the unused allowance.

PART 2 - DESIGN

2.1 INFORMATION AND PARAMETERS

A. NFPA 72 Public Mode signaling; Notification appliances shall consist of horn/strobe appliances.

B. NFPA 72 'Selective Detection' shall be employed. Fire detection throughout all spaces is not required or desired.

C. Conventional Fire Alarm Control Unit to be provided in this project.

D. Class A initiating device and notification appliance circuits are acceptable.

E. Circuit survivability 0 is permitted since system is designed for total evacuation. Partial evacuation or relocation of occupants is not envisioned.

F. Verify with battery calculations that existing standby battery capacity is adequate including the installation of all new devices and appliances; shall be sized for 24 hours of standby current plus 5 minutes full-load alarm current.

2.2 SEQUENCE OF OPERATION

A. Refer to Drawings.

PART 3 - PRODUCTS AND EQUIPMENT

A. All fire alarm and detection equipment shall be FM approved for fire protection service and shall be compatible with the new Fire Alarm Control Unit.

3.1 CABLE AND CONDUCTORS

A. Fire alarm cable:

1. Solid or stranded copper complying with NEC Article 760 for NPLFA or PLFA as applicable.
2. Listed fire alarm cable is permitted.
3. Comply with fire alarm equipment manufacturer's written instructions for circuit types.

B. Connectors:

1. Pre-insulated crimp connectors; Nylon housing, copper insert and tin plating; 221OF temperature rating; Nominal 600V electrical rating.
1. UL 486C-listed; UL 94V-2 flame rating.
2. Install with manufacturer's crimp tool; comply with UL listed wiring combinations
2. Design equipment: Ideal Industries, Inc., Model 48/49 for solid conductor and NC-8 for stranded conductor
3. Acceptable manufacturers: Ideal Industries, Inc., Morris Products Inc., or accepted equal.

C. Fire Resistive Cable

1. NOT USED

3.2 FIRE ALARM CONTROL UNIT:

A. Electric power shall be from a dedicated 120 VAC, 50/60 Hz circuit breaker equipped with breaker lock.

B. Internal batteries sized for 24 hours standby current plus 5 minutes full-load alarm current;

C. Design Equipment: NOTIFIER SFP-2402 2-Zone Conventional Fire Alarm Panel, or approved equal.

3.3 MANUAL FIRE ALARM BOX

A. Double action; red polycarbonate box with word "Fire" imprinted on surface; resettable with key.

B. Provide where indicated on Drawings.

C. Design Equipment: Potter P32-1T-LP or approved equal.

3.4 NOTIFICATION APPLIANCES

A. Sounder, strobe and combination sounder/strobe type; 24 VDC; 1 Hz flash rate; UL 1971 and UL 464; red finish and trim with "FIRE" imprinted on appliance; field selectable candela ratings (15/30/75/110).

B. Minimum 83 dBA anechoic at 10 ft; Temporal 3 evacuation signal.

C. Candela setting shall comply with NFPA 72 Chapter 18 based on the actual coverage area of the appliance.

D. Wall mount or ceiling mount as indicated on drawings.

3.5 INTELLIGENT PHOTOELECTRIC SPOT TYPE SMOKE SENSOR:

A. Two or Four wire, intelligent digital photoelectric sensor

B. +32°F (0°C) to 100°F (38°C) operating temperature range, 10-93% Relative Humidity (non-Condensing)

C. Install at locations indicated on drawings.

D. Design equipment: Fenwal PSD-7125 Photoelectric Spot Type Smoke Detector.

PART 4 - EXECUTION

4.1 INSTALLATION

A. The branch circuit supplying fire alarm equipment or emergency communication system shall supply no other loads. The location of the branch circuit disconnecting means shall be permanently identified at the control unit. System circuit disconnecting means shall be permanently identified as to its purpose in accordance with NFPA 72. For fire alarm and/or signaling systems, the circuit disconnecting means shall have a red marking. Where a circuit breaker is the disconnecting means, a listed breaker locking device shall be installed.

B. The Contractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets, and similar devices necessary for the complete installation. All wiring shall be of the type recommended by the Manufacturer.

C. Fire alarm cable shall comply with NEC Article 760 for NPLFA or PLFA as applicable OR shall be listed fire alarm cable; solid OR stranded copper is permitted; and shall comply with the manufacturer's written instructions for initiating device circuits, signaling line circuits and notification appliance circuits.

D. All conductors shall be installed in EMT where conductors are not concealed above ceilings or in walls or as otherwise prescribed by NEC Article 760, such as when passing through a floor. Conductors located at the roof deck are not required to be in EMT, and shall be attached to the building structure with approved supports.

E. Fire resistive cable (where applicable) shall be installed in accordance with the product listing and the manufacturer's written installation instructions.

F. All low voltage operations for all fire alarm system devices shall be provided from the control unit.

G. All wiring within the control panel shall be neatly served in the panel gutters, where applicable, and shall be secured by means of Thomas & Betts "Ty-Raps" or by other approved means.

H. Each circuit shall utilize wire of a color different and distinguishable from other circuits. Color coding shall be approved by the Owner's Designated Representative. Colors shall be continuous throughout each entire circuit. Match existing.

I. Raceways shall not contain both power limited and non-power limited conductors unless specifically permitted by NEC and the manufacturer's equipment listings.

J. Raceway shall enter panels from the sides or bottom; no raceway shall enter the top of an enclosure.

K. Exposed raceways shall be run parallel and perpendicular to the walls and ceilings. Wherever practical, exposed raceways shall be run on the ceiling as close as possible to a wall or as high as possible on a wall. Where exposed raceways must cross under a structural beam or rib, they shall be run down on one side of the beam or rib, across its bottom, and up to the ceiling on the other side of the beam or rib. No spanning from beam to beam or rib to rib will be permitted. The use of a conduit body on one side of a beam or rib will be permitted provided it will be readily accessible.

L. All raceways, flexible raceways, mounting boxes, junction boxes, and panels shall be securely fastened to ensure positive grounding throughout the entire system.

M. Where new penetrations of floor slabs or fire walls are made, they shall be fire-stopped in accordance with the building code.

N. End-of-line resistors shall be furnished as required and shall be mounted as directed by the Manufacturer. End-of-line resistors shall comply with the system Manufacturer's recommendations.

O. Magnetic door holders that allow doors to close upon loss of operating power shall not be required to have a secondary power source.

P. The field location of the End-of-line resistors shall be labeled so that the devices may be easily located, and that location shall be noted on the point-to-point drawings.

Q. All wiring shall be tested for stray voltage, short circuits, and ground faults prior to connection to the control panel and any devices.

R. Splicing of wiring connections, use of common wire nuts, or more than two wires on one terminal screw is prohibited.

4.2 FIELD QUALITY ASSURANCE

A. Final Acceptance/Commissioning Test: Perform testing per NFPA 72. This shall include sound pressure level measurements to confirm NFPA 72 public mode signaling. The system will be accepted only after satisfactory test of the entire system has been accomplished by the Contractor. The Contractor shall provide notification 72 hours prior to the commencement of testing. Failure to contact the above parties will require the Contractor to conduct tests a second time at the Contractor's expense.

B. Confirm at alarm, trouble and supervisory signals are received at the supervisory station.

4.3 INTERFACE WITH OTHER PRODUCTS

A. Connect fire suppression system alarm, supervisory and trouble contacts to the signaling line circuit. Verify supervision by testing.

4.4 DEMONSTRATION AND TRAINING

A. Prior to final acceptance of the fire alarm system, the Contractor and supplier shall provide operation training to each shift of the Owner's personnel. Each training session shall be conducted during shifts or at another time acceptable to the Owner. Each session shall include an overview of the system and the devices connected to it, emergency procedures (including alarm, trouble and supervisory condition procedures), control panel operation, and safety requirements. Each session shall include a complete demonstration of the system. Dates and times of each training period shall be coordinated through the Owner, not less than two weeks prior to the training session.

B. Instruction shall be provided by a material or system manufacturer's certified representative familiar with the equipment and special operating requirements of the system provided and the Owner's operating procedures.

END OF SECTION 28 46 00

ITEM 627.0031 25 EARTHWORK

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0031 25 **EARTHWORK**

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 31 20 00 – EARTH MOVING

B. Section 31 23 16 – EXCAVATION

C. Section 31 25 00 – EROSION AND SEDIMENTATION CONTROLS

D. Section 31 50 00 – EXCAVATION SUPPORT AND PROTECTION

6.02 This item shall include, but not be limited to, the following:

A. Perform site clearing, stripping, stockpiling, and disposal of topsoil, unsuitable soils, rock, and excess excavated materials, including documentation of preconstruction site conditions.

B. Excavate for structures, utilities, pavements, and trenches to required lines, grades, and depths, including rock removal, trench stabilization, and bell-hole excavation for piping.

C. Provide dewatering systems and surface-water controls to maintain dry, stable excavations and protect adjacent facilities and subgrades.

D. Furnish and install bedding, pipe zone material, backfill, and flowable fill, compacted in controlled lifts to specified densities for paved and unpaved areas.

E. Install warning tape, tracer wire, and utility markers above buried utilities to allow future locating and identification of pipelines.

F. Implement temporary and permanent erosion and sedimentation controls, including silt fence, wattles, inlet protection, berms, slope drains, seeding, and mulching, in compliance with NYSDEC requirements.

G. Design, install, monitor, and remove excavation support and protection systems such as soldier piles, lagging, sheet piling, tiebacks, and bracing to protect workers and adjacent structures.

H. Perform grading, subgrade preparation, compaction testing, cleanup, and site restoration, including maintenance of trenches and stabilized areas until final acceptance.

SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.1 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
   1. Final Backfill: Backfill placed over bedding course to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Authority. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
   3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Authority. Unauthorized excavation, as well as remedial work directed by the Authority, shall be without additional compensation.

E. Fill: Soil materials used to raise existing grades.

F. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
   1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
   2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

H. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix

asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement, or a cement concrete or hot-mix asphalt walk.

I. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.2 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
2. Controlled low-strength material, including design mixture.
3. Warning tapes.

B. Qualification Data: For qualified testing agency.

C. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.
3. Submit test data with supplier's name, location of source and sieve analysis of material showing conformance with the specifications.

D. Dewatering Plan
1. Include a written plan for dewatering operations including control procedures to be adopted if dewatering problems arise.

E. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.3 QUALITY ASSURANCE

A. Codes and Standards
1. Comply with the provisions of the following codes and standards except where more stringent requirements are shown or specified.
a. Local Regulations
b. New York State Department of Transportation (NYSDOT) Standard Specification dated January 1, 2019, and any subsequent addendums.
2. Excavations, trench depths and widths, sheeting, shoring, bracing, and cutback slopes to be determined by the Contractor and shall comply with standards set by OSHA, NYS Department of Labor, NYS Industrial Code and all other applicable safety standards.

B. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.4 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Authority and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by the Authority or authorities having jurisdiction.

B. Utility Locator Service: Notify UDig New York at 811 and local utility agencies for area where Project is located before beginning earth moving operations.

C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures specified in the Contract Documents, are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrowed soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
   1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Course: Suitable material conforming to NYSDOT Item 304.12, Type 2. Comply with the gradation and material requirements specified below:
   1. Magnesium Sulfate Soundness Test: 20 percent maximum loss by weight after four test cycles.
   2. Plasticity Index: The plasticity index of the material passing the No. 40 mesh sieve will not exceed 5.0.
   3. Elongated Particles: Not more than 30 percent, by weight, of the particles retained on a ½ inch sieve will consist of flat or elongated particles. A flat or elongated particle is defined as one which as its greatest dimension more than three times its least dimension.

SIEVE		PERCENT PASSING (%) BY WEIGHT
SIEVE SIZE	SIZE OPENING	
2 inch	50 mm	100
¼ inch	6.3 mm	25 – 60
No. 40	425 µm	5 – 40
No. 200	75 µm	0 - 10

E. Select Granular Fill: Suitable material conforming to NYSDOT Item 203.07. Comply with the gradation and material requirements specified below:
   1. Magnesium Sulfate Soundness Test: 30 percent maximum loss by weight.
   2. RAP shall not be utilized.

SIEVE		PERCENT PASSING (%) BY WEIGHT
SIEVE SIZE	SIZE OPENING	
4”	100 mm	100
No. 40	425 um	0 - 70
No. 200	75 µm	0 - 15

F. Pipe Bedding Material: Suitable material conforming to NYSDOT Designation 733-15, Sand Backfill.
   1. Comply with gradation and material requirements specified below:
   2. Provide materials substantially free of shale and soft, poor durability particles.

SIEVE		PERCENT PASSING (%) BY WEIGHT
SIEVE SIZE	SIZE OPENING	
1/2 inch	12.7mm	100
1/4 inch	6.3 mm	90 -100
No. 200	75 µm	0 - 5

G. Backfill for utility pipes and structures (non-paved areas): Satisfactory soils consisting of on-site or borrow soil materials.
   1. Provide satisfactory soil materials free of any organic or other deleterious materials.

H. Backfill for utility pipes and structures in paved areas shall meet the requirements of NYSDOT Item 203.07, Select Granular Fill.

I. Complied for utility structures: Suitable material conforming to NYSDOT Item 304.14, Type 4. Comply with the gradation and material requirements specified below:
   1. Magnesium Sulfate Soundness Test: 20 percent maximum loss by weight after four test cycles.
   2. Plasticity Index: The plasticity index of the material passing the No. 40 mesh sieve will not exceed 5.0.
   3. Elongated Particles: Not more than 30 percent, by weight, of the particles retained on a ½ inch sieve will consist of flat or elongated particles. A flat or elongated particle is defined as one which has its greatest dimension, more than three times its least dimension.

SIEVE		PERCENT PASSING (%) BY WEIGHT
SIEVE SIZE	SIZE OPENING	
2 inch	50 mm	100
¼ inch	6.3 mm	30 – 65
No. 40	425 µm	5 – 40
No. 200	75 µm	0 - 10

2.2 GEOTEXTILES

A. Geotextiles shall meet the requirements of NYSDOT Items listed below for each type. Material requirements for each classification will meet the default class of the approved materials list of NYSDOT (http://nysdot.gov). The following geotextiles and their classification are as follows:
1. Separation Geotextile: Subbase separation, classification S, NYSDOT Item 207.21

2.3 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Self-compacting, flowable concrete material produced from the following:
1. Portland Cement: ASTM C 150, Type I / II.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/4-inch nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869.
5. Water: ASTM C 94.
6. Air-Entraining Admixture: ASTM C 260.

B. Produce conventional-weight, controlled low-strength material with 140-psi compressive strength when tested according to ASTM C 495.

2.4 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
1. Red: Electric.
2. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth. If rock is encountered, do not excavate rock until it has been classified by the Authority.
   1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
   2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
      a. 6 inches beneath pipe in trenches, and 24 inches wider than pipe.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1-inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1-inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Report to the Authority, the elevations of ground water where evident during excavation within building areas.

C. Protect excavated areas which are to support foundations or other work against freezing, by means of insulated blankets, hay or other approved methods. Where bearing areas have been subjected to frost penetration, remove affected material as directed by the Authority and pay for the cost of additional excavation, materials and construction necessary to rectify condition.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line, unless otherwise indicated on the Contract Documents.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.
   1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate trenches 6 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.
   1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 SUBGRADE INSPECTION

A. Notify the Authority when excavations have reached required subgrade.

B. If the Authority determines that unsatisfactory soil is present, continue excavation and replace it with compacted backfill or fill material as directed.

C. Proof-roll subgrade below pavements with a non-vibratory roller to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
   1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
   2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by the Authority, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Authority, without additional compensation.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by the Authority.
   1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by the Authority.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, subdrainage, damp proofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for Record Documents.
   3. Testing and inspecting underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.
   7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 FILLING AND BACKFILLING STRUCTURES

A. Exterior Structures:
   1. Provide compacted leveling bed.
   2. Place in layers of not more than 6 inches loose depth compacted with heavy equipment.
   3. Grade smooth and even, free of voids, to required elevation. Provide final grades within a tolerance of ½ inch when tested with a 10-foot straightedge.

B. Exterior Slabs on Grade:
   1. Provide subbase course to depths indicated and placed in layers of not more than 6-inch loose depth.
   2. Compact with heavy equipment.

3.13 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Roadways: Provide 4-inch- thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course. Concrete is specified in Section 03 30 00 – Cast-in-Place Concrete.

D. Backfill voids with satisfactory soil while removing shoring and bracing.

E. Place and compact initial backfill of bedding material to a height of 12 inches over the pipe or

conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

F. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches over the pipe or conduit. Coordinate backfilling with utilities testing.

G. Place and compact final backfill using satisfactory soil (non-paved areas) or select granular fill (paved areas) to final subgrade elevation.

H. Install warning tape directly above utilities, a maximum of 18 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.14 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:
1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use select granular fill.
3. Under exterior structures, use select granular fill.

C. Place soil fills on subgrades free of mud, frost, snow, or ice.

3.15 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.16 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
1. Under structures, slabs and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each

layer of backfill or fill soil material at 92 percent.

3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.17 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Turf or Unpaved Areas: Plus or minus 1-inch.
   2. Walks: Plus or minus 1/2-inch.
   3. Pavements: Plus or minus 1/2-inch.

C. Grading Inside Structure Lines: Finish subgrade to a tolerance of 1/2-inch when tested with a 10-foot straightedge.

3.18 SUBBASE COURSE UNDER PAVEMENTS AND WALKS

A. Place subbase course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course under pavements and walks as follows:
   1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
   2. Shape subbase course to required crown elevations and cross-slope grades.
   3. Place subbase course 6 inches or less in compacted thickness in a single layer.
   4. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   5. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 FIELD QUALITY CONTROL

A. Special Inspections: Contractor shall engage a qualified special inspector to perform the following special inspections:
   1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
   2. Determine that fill material and maximum lift thickness comply with requirements.
   3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Contractor shall engage a qualified geotechnical engineering testing agency to

perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
   1. Paved and Structure Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or structure, but in no case fewer than three tests.
   2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150-feet or less of trench length, but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.20 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by the Authority; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off the Authority's property.

END OF SECTION 31 20 00

SECTION 31 23 16

EXCAVATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Preconstruction Site Photos
2. Site Clearing
3. Trenching
4. Rock Removal
5. Dewatering
6. Backfill
7. Warning Tape and Tracer Wire
8. Utility Marker
9. Disposal of Spoils
10. Flowable Fill

B. Related Sections:
1. Section 31 25 00 – Erosion and Sedimentation Controls

1.3 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in- place surface soil and is the zone where plant roots grow.

D. Plant Protection Zone: Area surrounding individual trees and groups of trees to be protected during construction as indicated on the Construction Drawings.

E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

F. Rock removal shall consist of the removal of all sound, solid rock which is in its original position in ledges, bedded deposits, or unstratified masses and which is of such hardness and texture that it cannot be loosened or broken down and removed without drilling, wedging, or blasting.

1. Additionally, any boulders, stones, or pieces of masonry encountered with a volume of 1/2 cubic yard or more shall be considered rock removal.
2. Hard pan, small boulders with volume of less than 1/2 cubic yard, chert, clay, soft shale, soft and disintegrated rock, and similar material shall not be considered rock removal.

G. Pipe Zone:
1. Bedding (Lower Pipe Zone): The trench area around a buried pipe that begins 6 inches below the pipe bell and extends upwards to the invert of the pipe for the full width of the trench.
2. Upper Pipe Zone: The trench area around a buried pipe that begins at the invert of the pipe and extends upwards to 12 inches above the pipe crown for the full width of the trench.

H. Paved Area: Shall be the considered any excavation that is under pavement (asphalt, concrete, gravel, etc.) or the edge of the pavement surface is within 3 feet horizontally of the pipe.

I. Backfill: The trench area that begins at the top of the Pipe Zone and extends upwards to the surface or to the bottom of the first paving layer.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain the Owner's property, cleared materials shall become the Contractor's property and shall be removed from the Site.

1.5 SUBMITTALS

A. Preconstruction Site Photos and Videos
1. Take digital photographs along centerline of proposed pipe trench; minimum one photograph for each 50 feet of pipe trench. Take video of the entire project area along each pipe main and service.
2. Show mailboxes, curbing, lawns, driveways, signs, culverts, and other existing Site features in both right-of-way and private property to the service meter. Record existing settlement or cracking of adjacent structures, pavements, and improvements.
3. Include Project description, date taken, and sequential number in the file name of each photograph.

B. Traffic control plan in accordance with roadway agency, MUTCD, and OSHA regulations.

C. Site Clearing
1. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establish preconstruction conditions that might be misconstrued as damage caused by site clearing.
   a. Use sufficiently detailed photographs or videotape.
   b. Include plans and notations to indicate specific wounds and damage

conditions of each tree or other plants designated to remain.

2. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

D. Rock Removal
1. Shop Drawings: Indicate proposed method of blasting, delay pattern, explosive types, type of blasting mat or cover, and intended rock removal method.
2. Survey Report: Submit survey report on conditions of buildings near locations of rock removal.

PART 2 – PRODUCTS

2.1 BACKFILL SOILS

A. Native soil backfill will be allowed above the Pipe Zone provided that the material excavated is free of stones greater than 3 inches, dirt clods, debris, frozen materials, organic matter, roots, or refuse.

B. Borrow materials previously approved by the Engineer may be used for backfill if suitable material is not available from the excavation.

2.2 TRENCH STABILIZATION MATERIAL

A. Base Rock: NYSDOT Type 2 Subbase (also known as Crusher Run) as specified in Section 304 of the NYSDOT Standard Specifications.

2.3 PIPE ZONE AND CRUSHED STONE BACKFILL MATERIAL

A. For Pipe Zone and backfill in paved areas, concrete surfaced areas, and gravel surfaced areas, all backfill shall consist of compacted NYSDOT Type 2 Subbase (also known as Crusher Run) as specified in Section 304 of the NYSDOT Standard Specifications
B. Excavated Backfill Soils as described in Part 2.1 above.

2.4 COMPACTED BACKFILL

A. For backfill to be compacted during the installation of flexible pipe outside of paved areas, no rocks or foreign objects greater than 3 inches shall be allowed.

B. For backfill to be compacted during the installation of rigid pipe outside of paved areas, no rocks or foreign material greater than 3 inches shall be allowed. If soil backfill material is unsuitable, crushed stone may be used for backfill to 18 inches over the pipe being installed.

2.5 FLOWABLE FILL

A. Select and proportion ingredients to obtain compressive strength between 50 psi and 200 psi at 28 days in accordance with ASTM D4832.

B. Materials:
   1. Cement: ASTM C150, Type I or Type II.
   2. Aggregate: ASTM C33, Size 7.
   3. Fly Ash (if used): ASTM C618, Class C.
   4. Water: Clean, potable, containing less than 500 ppm of chlorides.

2.6 MISCELLANENOUS CRUSHED STONE

A. Crushed stone, NYSDOT #1A (3/4") clean stone as specified in Section 703 of the NYSDOT Standard Specifications.
   1. For use only where specified on the Drawings, Standard Details, or where approved by Owner.

2.7 ROCK REMOVAL

A. Explosives: Type recommended by explosives firm following seismic survey and required by authorities having jurisdiction.

B. Delay Device: Type recommended by explosives firm.

C. Blast Mat Materials: Type recommended by explosives firm.

2.8 WARNING TAPE AND TRACER WIRE

A. Detectable Warning Tape:
   1. All pipelines installed via open trench shall be installed with detectable warning tape. Detectable warning tape shall be:
      a. 6 inches wide, 4 mils thick.
      b. Inert, bonded layer plastic.
      c. Metallized foil core.
      d. Highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils.
      e. Utility and Tape Color: Gas = Yellow; Sewer = Green; and Water = Blue.
      f. Continuously marked with "CAUTION ### LINE BURIED BELOW".
         1) "###" shall be the utility being installed "GAS", "SEWER", or "WATER".

B. Tracer Wire:
   1. All pipelines, including but not limited to ductile and PVC shall be installed with tracing wire.
   2. Material: Minimum 10-gauge solid copper with high-density polyethylene (HDPE) or high-molecular weight polyethylene (HMWWPE) insulation suitable for direct bury.
   3. Splices: Use wire nut or lug suitable for direct bury as recommended by tracer wire manufacturer. Wire splices shall be taped with waterproof tape.
   4. Manufacturers:
      a. Copperhead Industries, LLC.
      b. Performance Wire & Cable Inc.
      c. Pro-Line Safety Products Company.

5. Valve Box Access:
   a. Tracer wire shall be looped through valve boxes in order to be accessible for pipe locating.
   b. Wire shall be coiled within valve box so that it may extend 3-foot above grade.
   c. Sleeve wire in 1/2-inch PVC pipe within valve box to avoid conflict accessing nut.
   d. In multiple valve installations, only one wire shall be brought up into each box.

2.9 UTILITY MARKER

A. Post shall consist of C-shaped thermoplastic extrusion, 3.75-inch wide (minimum), 0.160 typical walls, curved profile with 3-inch radius. Capable of sustaining a minimum of ten direct wheel- over impacts at 60 MPH without damage to post. Constructed of UV-stabilized thermoplastic polycarbonate, without anchor. Shall be made in the U.S.A.

B. Post shall be 66 inches long (min.) and color shall match utility as noted below, with white decal, and black custom lettering. See Standard Details for custom message.
   1. Utility and Post Color: Gas = Yellow; Sewer = Green; and Water = Blue.

C. Manufacturer and Supply:
   1. Post shall be “FG-500 Series” post manufactured by Davidson Traffic Products or approved equal.

PART 3 – EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain. Wrap blue vinyl tie tape around each tree at an easily visible height.

C. Protect existing site improvements to remain from damage during construction.

D. Contact UDig NY location services at 811 not less than three working days before performing Work. Request underground utilities to be located and marked within and surrounding construction areas.
   1. Keep utility locates up to date until excavation has received final backfill in that area.

E. Setup and install traffic control around the work zone in accordance with roadway agency, NYSDOT, and OSHA regulations.

3.2 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
   1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.

2. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
3. Use only hand methods for grubbing within protection zones.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

3.3 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil away from edge of excavations. Grade and shape stockpiles to drain surface water. Cover to prevent windblow dust and erosion by water.

3.4 SITE IMPROVEMENTS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, waste materials including trash and debris, and legally dispose of the off of the Owner's property.

3.5 LAYOUT

A. Establish line and grade of trench prior to any excavation. This may be done by staking of the alignment with cut/fill depths noted on the stake at regular intervals and at points where the alignment changes direction.

3.6 EXCAVATION FOR TRENCHES

A. Open cut excavation for pipelines shall be true to the lines and grades shown on the Construction Drawings or as established by the Owner's representative. Cut the banks of trenches between vertical parallel plans equidistant from the pipe centerline.

B. Trenches shall be excavated to a depth sufficient to allow a minimum of 36 inches of cover over the installed pipeline.

C. In areas of rock excavation, the trench shall be excavated such that there is 12 inches of separation between unexcavated stone and the bottom of the pipe and 12 inches of separation between solid stone and either side of the pipe.

D. The horizontal distance between the vertical planes (or between the inside faces of installed sheeting) shall vary with the size of the pipe to be installed but shall not be more than the distance standard details.

E. Excavate bell holes for bell and spigot pipe so that the barrel of the pipe will rest for its entire length upon the bottom of the trench.

F. Do not excavate pipe trenches more than 200 feet ahead of the pipe laying and perform all work so as to cause the least possible inconvenience to the public. Construct temporary access and bypass routes as the Owner deems necessary to maintain vehicular or pedestrian traffic.

G. In all cases where materials are deposited along open trenches, place them so that in the event of rain or surcharge loading from such deposits no damage will result to the work and/or to adjacent property. Comply with all erosion and siltation control criteria during all excavation activities.

H. Line construction across all stream corridors shall be in accordance with regulatory criteria, any required permits. Comply with criteria regarding erosion and siltation control measures, side cast of excavated materials, trench excavation during stream low flow conditions, etc. The Contractor shall be responsible for paying any fines or penalties resulting from the Contractor's failure to comply with these regulations.

3.7 EXCAVATION FOR MANHOLES AND STRUCTURES

A. Excavation for manholes, inlets, vaults, and other incidental structures shall not be greater in horizontal area that that required to allow a two-foot clearance between the outer surface of the structure and the walls of the adjacent excavation or of the sheeting used to protect it.

B. The bottom of the excavation shall be true to the required shape and elevation as shown on the Construction Drawings.

C. No soil backfilling will be permitted under manholes, inlets, vaults or similar structures. Should the Contractor excavate below the elevations shown or specified, they shall, at their own expense, fill the void with either concrete or compacted granular material approved by the Owner.

D. Excavation for manholes and other structures may be performed with nonvertical banks except beneath pavements or adjoining existing improvements. The bottom of the excavation shall be true to the required shape and elevation shown on the Construction Drawings.

3.8 SHORING

A. Trench safety and protection are the sole responsibility of the contractor and shall meet OSHA and local regulations.

B. Shoring shall be designed to withstand the pressures of earth being held back and the loading from nearby structures, roadways, and railways.

C. When shoring is within the right-of-way or theoretical embankment zone of a railroad track the shoring system shall be designed and stamped by an engineer licensed in the State of New York.

3.9 DEWATERING

A. Furnish dewatering and surface water control systems to permit work to be completed on dry and stable subgrade.

B. Provide standby equipment in the case of dewatering equipment failure.
   1. Standby equipment shall be stored at the Site and ready for immediate use.
   2. Provide one spare dewatering pump per dewatering system installed. The spare pump shall have a capacity equal to or greater than the larges pup in the dewatering system.
   3. Each pump shall be supplied with its own portable electric generator.

C. Discharge removed water in accordance with the standard details.

3.10 GENERAL BACKFILLING METHODS

A. Backfilling operations shall be performed so as not to disturb or injure any pipe or structure against which the backfill is being placed. If any pipe or structure is damaged or displaced during backfilling, Contractor shall open up the backfill and make whatever repairs are necessary. This work shall be done at no cost to Owner.

B. Backfilling and clean-up operations shall closely follow pipe laying. Do not leave more than 50 feet of trench open at end of working day.

C. Protect open trench to prevent danger to the public.

D. Place backfill above the Pipe Zone in no more that 6-inch lifts using a jumping jack compactor between lifts.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Consolidating by flooding will not be permitted under or adjacent to paved or unpaved traffic areas. If tests for in-place density consistently fail to meet the requirements, Owner may require Contractor to change his method of compaction.

G. Backfill trenches to contours and elevations with suitable fill materials described above.

H. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

I. Required Compaction Density:
   1. Crushed Stone: 95% of maximum dry density.
   2. Soils: 85% of maximum dry density.
   3. Maximum dry density of standard Proctor as determined by ASTM D698.

3.11 TRENCH STABILIZATION MATERIAL INSTALLATION

A. Rebuild trench bottom with imported trench stabilization material when trench excavation exceeds elevation of trench zone as directed by Owner.

B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.

C. Compact each lift so as to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts. Compaction shall be by a jumping jack compactor between lifts.

3.12 PIPE ZONE MATERIAL INSTALLATION

A. Pipe Zone Bedding shall consist of a minimum of 6 inches of Class, Grade D crushed stone.

B. Upper Pipe Zone:
1. For flexible pipe materials (PVC, HDPE, etc.) and all pipes under or near paved areas, the Upper Pipe Zone shall consist of Class A, Grade D crushed stone.
2. For rigid pipe materials (DI, Steel, etc.) outside of paved areas, the Upper Pipe Zone shall consist of Backfill Soils.

C. Hand grade and mechanically compact each lift to provide a firm, unyielding surface.

D. The bedding material shall be shaped for bell and spigot pipe at proper intervals to provide uniform bearing under the entire length of the pipe.

E. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by “walking in” and slicing material under haunches with a rod to ensure that voids are completely filled before placing each succeeding lift.

F. After the full depth of the Pipe Zone material has been placed as specified, compact the material by a minimum of three passes with a jumping jack compactor only over the area between the sides of the pipe and the trench walls.

G. Do not use power-driven impact compactors to compact Pipe Zone material directly over the pipe.

H. Pipe zone material shall be compacted to the maximum dry density as specified herein.

3.13 FLOWABLE FILL

A. Where noted on the Construction Drawings or as directed by the Owner’s representative, flowable fill will be used for backfill.

3.14 DISPOSAL OF MATERIALS

A. Whenever practicable, all materials removed by excavation that are suitable for backfilling pipe trenches or for other purposes shown on the Drawings or directed by the Owner shall be used for these purposes. Any surplus materials not so used shall be managed by Contractor as either consisting solely of earth, rock, concrete or asphalt

paving materials ("Clean Spoil") or, if determined by OWNER to be something other than Clean Spoil, as Waste Materials.

B. Clean Spoil may be deposited in spoil areas at site locations found by Contractor. For all such areas, the Contractor shall obtain written permission from the property owner and furnish to Owner in advance of depositing any such Clean Spoil on any such site location. Receipt by Owner of the written permission shall not relieve the Contractor of its responsibilities to comply fully with its obligations under the Contract Documents and all Laws and Regulations relating to such Clean Spoil.

C. Unless otherwise provided in the Contract Documents, Waste Materials shall be properly classified by Contractor and lawfully transported to and disposed of in an appropriate permitted facility approved by Owner. Proof of each such transport and disposal shall be provided to Owner within 24 hours after such disposal.

D. Once any part of the Work is completed, the Contractor shall properly manage all surplus Clean Spoil and lawfully dispose of all Waste Materials left within the construction's limits of that Work. The Contractor is responsible for the removal, hauling and final management of Clean Spoil and Waste Materials. The Contractor is responsible for locating spoil sites for depositing of Clean Spoil and appropriate landfills for disposal of Waste Materials and for obtaining all related permissions from spoil site owners and landfill operators, as appropriate, and all required permits from all governmental agencies having jurisdiction over the depositing of such Clean Spoil or disposal of such Waste Materials.

E. The depositing of Clean Spoil and the disposal of Waste Materials in the manner described above shall be considered an integral part of the excavation work, and one for which NO separate payment shall be allowed.

3.15 CLEAN-UP

A. After completing section of excavating, remove all debris and all construction materials from the work zone. Then grade and smooth over the surface on both sides of the trench. Leave the entire area clean and in a condition satisfactory to the Owner.

3.16 MAINTENANCE

A. Contractor shall seed and maintain in good condition all excavated areas, trenches, fills, embankments, and channels until final acceptance by Owner.

B. Contractor shall maintain trench backfill at the approximate level of the original ground surface by periodically adding backfill material wherever necessary and whenever directed to do so by Owner. Continue such maintenance until final acceptance of the work or until Owner issues a written release.

END OF SECTION 31 23 16

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section

1.2 SUMMARY

A. Section Includes:
   1. Implementation of temporary and permanent erosion and sedimentation controls.

B. Related Sections
   1. Section 31 23 16 – Excavation.
   2. Section 32 92 00 – Turf and Grasses.

1.3 REFERENCES

A. New York State Department of Environment and Conversation (NYSDEC)
   1. General NPDES Permit for Discharges of Storm Water Associated with Construction Activities, latest version.
   2. NYS Erosion & Sediment Control Handbook, latest edition.

B. In the event of conflict between these requirements and pollution control laws, rules or regulations, or other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

1.4 SYSTEM DESCRIPTION

A. The work specified in this Section consists of providing, maintaining, and removing temporary erosion and sedimentation control.

B. The Contractor shall follow the latest edition of the New York State Erosion and Sedimentation Control Handbook.

C. Temporary erosion controls include, but are not limited to, grassing, mulching, watering and reseeding on-site surfaces and spoil and borrow area surfaces, and providing interceptor ditches at ends of berms and at locations which will ensure that erosion during construction will be either eliminated or maintained in accordance with applicable regulations.

D. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, filter stone and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained in accordance with

applicable regulations.

E. Temporary Erosion and Sedimentation Control: In general, temporary erosion and sedimentation control procedures shall be directed toward the following:
   1. Preventing soil erosion at the source.
   2. Preventing silt and sediment from leaving the site if soil erosion cannot be prevented.
   3. Preventing silt and sediment from migrating downstream in the event it cannot be prevented from leaving the site.

F. Permanent Erosion Control: Permanent erosion control measure shall be implemented to prevent sedimentation of the waterways and to prevent erosion of the project site.

G. Basic Principles
   1. Conduct the earthwork and excavation activities in such a manner to fit the topography, soil type, and condition.
   2. Minimize the disturbed area and the duration of exposure to erosion elements.
   3. Stabilize disturbed areas immediately.
   4. Safely convey run-off from the site to an outlet such that erosion will not be increased off site.
   5. Retain sediment on site that was generated on site.
   6. Minimize encroachment upon watercourses.

PART 2 – PRODUCTS

2.1 GRASS SEED AND MULCH

A. Temporary seeding shall be in accordance with NYSDEC Erosion & Sediment Control Handbook.

B. Permanent seeding shall be in accordance with Section 32 92 00 – Turf and Grasses.

2.2 TEMPORARY SILT FENCE

A. Geotextile Fence
   1. Equivalent Opening Size per US Standard Sieve: 50-100 (maximum).
   2. Grab Tensile Strength per ASTM D4632: 160 lbs. (minimum).
   3. UV Stability per ASTM D4355: 70% Strength Resistance (minimum).
   4. With 14-gauge steel wire backing with maximum mesh size of 6 inches.

B. Support Posts:
   1. Materials: Hardwoods, steel, or pressure treated softwoods.
   2. Wood posts shall be 2”x2” (minimum).

C. Fasteners: Heavy-duty wire staples as least 1-inch long, tie wires, or hog rings as recommended by geotextile manufacturer.

2.3 WATTLES

A. A wattle (a.k.a. sediment logs or tubes) shall be a tubular-shaped product specifically manufactured for sediment control. They may be used for slope, perimeter, channel, or inlet sediment control and capture.

B. Wattles shall be manufactured using interwoven biodegradable plant material such as straw, coir, or wood shavings (i.e. excelsior fibers) in a bio or photodegradable netting that is of sufficient strength to resist damage when handling.

C. The diameter of and spacing between wattles shall be based on the gradient and length of slope in accordance with following table:

SLOPE	WATTLE DIAMETER				
	8”	**12”**	**18”**	**20”**	**24”**
2% OR LESS	70’	100’	N/A	N/A	N/A
5%	30’	60’	100’	100’	100’
10%	20’	30’	70’	85’	100’
6:1	N/A	20’	40’	50’	55’
4:1	N/A	20’	30’	30’	30’
3:1	N/A	N/A	20’	20’	25’
2:1	N/A	N/A	20’	20’	20’

2.4 INLET PROTECTION

A. Inlet protection for area drain and curb inlets shall be via inlet filters manufactured by Flexstorm Inlet Filters, or approved equal.

2.5 STONE RIPRAP

A. Use sound, tough, durable stones resistant to the actions of air and water. Shaley pieces will not be acceptable. Specific gravity of 2.0 or greater.

B. Riprap shall have less than 66% wear when tested in accordance with AASHTO T-96.

C. Riprap sizes shall be in accordance with NYS Department of Transportation Standard Specifications.

2.6 STRAW BALES

A. Clean hay or straw of oats, wheat, barley, or rye free from noxious weed seeds; machine baled using standard baling wire or string.

B. Posts for straw bales shall be 2”x2” wood or metal posts.

PART 3 – EXECUTION

3.1 CONSTRUCTION OF STRUCTURES

A. Erosion & sediment controls shall be constructed, maintained, and removed in accordance with NYSDEC Erosion & Sediment Control Handbook. Different measures than those stated herein and called for on the Drawings may be required during construction, and may be found in the NYSDEC Handbook.

B. Temporary pollution control shall include construction activities outside the project area where such work is necessary as a result of construction. These areas include, but not limited to, borrow pits, equipment and material storage sites, and haul roads.

C. Sequence:
1. Install erosion and sediment controls prior to construction.
2. Perform and document an initial inspection of the installed measures with the Owner to review that all measures have been properly installed.
3. If at any time the Owner deems it necessary or if the Contractor observes problems during site inspections, the Contractor shall provide additional erosion prevention and sedimentation controls and mark changes on the plan or SWPPP. The site shall be provided with maximum protection from erosion and sediment loss at all times.
4. Perform regular inspection of all installed measures and document in accordance with the SWPPP or regulations.
5. Perform regular maintenance with clean any built up sediment and fix any broken or shifted control elements.
6. Install permanent controls once construction is complete in an area, and remove temporary controls once permanent controls are established. Depose of temporary measures in accordance with regulations.
7. With the Owner, complete and submit notice of completion paperwork to responsible agencies.
8. Maintain permanent controls during the warranty period in accordance with the Contract.

D. Temporary Silt Fence Installation
1. Not to be installed across areas of concentrated flow such as streams and ditches.
2. Install along the contour, never up or down a slope.
3. Maximum drainage area for silt fence with wire backing is 1 acre per 150 feet.
4. When installed at the base of a slope, install 5 to 7 feet away from the toe of slope.
5. Height of fence shall be no more than 24 to 26 inches above grade.
6. Construct from a continuous roll of fabric. When fabric joints are necessary, overlap a minimum of 4 feet.
7. Excavate a trench approximately 4 inches wide by 6 inches deep.
8. Place 8 inches of fabric in trench and backfill with compacted soil.
9. Install posts on downstream side of fabric, no more than 10 feet apart, and at least 16 inches into the ground.

E. Wattle Installation
1. Install by laying flat on the ground on contour and perpendicular to flow.
2. Excavate a small trench approximately 2-3 inches in depth, or per manufacturer's instructions.
3. Overlap ends of adjacent tubes a minimum of 6 inches, or per manufacturer's instructions.

4. Install wooden stakes at an angle, at 4 -foot intervals, and at least 12 inches deep, or per manufacturer's instructions.
5. Terminate ends of wattles with a dog leg up slope to prevent channeling of sediment.

F. Inlet protection filters shall be installed per the manufacturer's instructions.

G. Check Dams
1. Check dams are barriers composed of riprap, sandbags, wattles, or other non-corrodible material placed across or partially crossing a natural or constructed drainageway.
2. Check dams shall be constructed, maintained, and removed in accordance with NYSDEC Erosion & Sediment Control Handbook.
   a. If wattles are used, they may have to be stacked to meet required dimensions of check dams.

H. Temporary Berms
1. Use temporary berms at the top or base of disturbed slopes to prevent excessive erosion until permanent controls are installed or slopes stabilized.
2. Berms shall be constructed, maintained, and removed in accordance with NYSDEC Erosion & Sediment Control Handbook.

I. Temporary Slope Drains
1. A temporary slope drain is a facility consisting of stone, concrete, and/or asphalt gutters, fiber mats, plastic sheets, and drain pipe that may be used to carry runoff down a slope or around an area to reduce erosion on the slope or area avoided until permanent controls are installed and stabilized.
2. Slope drains shall be constructed, maintained, and removed in accordance with NYSDEC Erosion & Sediment Control Handbook.

J. Temporary Construction Entrance/Exit
1. Construction entrance shall be constructed wherever construction traffic leaves a site and enters a public or private roadway.
2. The entrance/exit shall be at least 50 feet long and at least 10 feet wide for one-way traffic, or at least 20 feet wide for two-way traffic. Shall have turning radii of at least 20 feet at the roadway (may be greater depending on speed of traffic). Install drain culvert as necessary for crossing ditches or streams.
3. Shall be constructed by:
   a. Undercutting at least 3 inches.
   b. Install geotextile fabric (NYSDOT Section 737-01D); and
   c. Install clean washed stone with a gradation of 2 to 4 inches, in a layer at least 8 inches thick.
4. Additional gravel may have to be added periodically to maintain proper function.
5. Remove gravel entrance and replace with new base course prior to construction of permanent new roadway.

K. Sediment Traps
1. Sediment basins, ponds, traps, and bags are prepared or manufactured storage areas to trap and store sediment from eroded areas to protect properties and

drainage channels below the construction area from excessive siltation.

2. Sediment traps shall be constructed, maintained, and removed in accordance with NYSDEC Erosion & Sediment Control Handbook.

L. Straw Bales:
1. Embed minimum of 4 inches in flat bottom trench.
2. Place with ends tightly abutting or overlapped. Corner abutment is not acceptable.
3. Install in order that bale bindings are oriented around the sides and not over the top and bottom of each bale.
4. Use two posts for each bale. Drive posts through bale until top of post is flush with top of bale.
5. Wedge loose straw in gaps between bales.

M. Soil Stockpiles
1. Protect from erosion with plastic sheeting and anchor from the wind with stakes or concrete blocks. If not active for more than 14 days, apply temporary seeding and mulch.
2. Surround piles with temporary silt fence or wattles within 10 feet of toe of stockpile.

N. Seeding and Mulching
1. Temporary seeding and soil stabilization shall be in accordance with NYSDEC Erosion & Sediment Control Handbook.
2. Permanent seeding shall be in accordance with Section 32 92 00 – Turf and Grasses.

3.2 FIELD QUALITY CONTROL

A. Conduct regular inspections and document in accordance with the SWPPP and applicable regulations.

B. Provide inspection documentation, reports, and SWPPP updates with Owner or agency upon request.

3.3 MAINTENANCE AND CLEANING

A. Clean, repair or replace failed or overloaded silt fences, wattles, check dams, or other temporary controls within two days after inspection.

B. Keeps roads and other paved surfaces swept clean of soil, stone, and debris at all times, and as directed by the Owner.

C. Install and provide maintenance for soil stabilization seeding at all times. This includes sprinkling with water to encourage and maintain growth of seedlings.

D. Temporary erosion and sediment controls once removed shall be become the property of the Contractor and disposed of properly and in accordance with applicable regulations.

E. Dress sediment deposits remaining after measure has been removed to conform to existing grade. Prepare and seed graded area.

END OF SECTION 31 25 00

SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. Section includes temporary excavation support and protection systems.

B. Related Requirements
   1. Section 31 20 00 – Earth Moving.

1.3 SUBMITTALS

A. Delegated-Design Submittal: For excavation support and protection systems, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

B. Professional Engineer: Experience with providing delegated-design engineering services of the type indicated, including documentation that engineer is licensed in the State in which Project is located.

C. Architect/Engineer will not be responsible for review shoring design. Furnish record copy for Architect and Structural Engineer.

1.4 FIELD CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:
   1. Notify Owner no fewer than two days in advance of proposed interruption of utility.
   2. Do not proceed with interruption of utility without written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
   1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection according to the performance requirements.

C. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as

benchmarks. Clearly identify benchmarks and record existing elevations.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Provide, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting earth and hydrostatic pressures and superimposed and construction loads.
   1. Contractor Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer.
   2. Prevent surface water from entering excavations by grading, dikes, or other means.
   3. Install excavation support and protection systems without damaging existing buildings, structures, and site improvements adjacent to excavation.
   4. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes and to ensure that damage to permanent structures is prevented.

2.2 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Excavation shoring or underpinning materials shall be designed and provided to resist the influence of any surcharge loads from adjacent existing structures, roadways, etc. shown on the Contract Drawings.

C. Materials shall be provided with enough size and strength rating as determined by the application.

PART 3 – EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
   1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that construction and finishing of other work is not impeded.

3.2 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.

C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

3.3 SHEET PILING

A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock vertical edges to form a continuous barrier.

B. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

C. Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

A. Drill, install, grout, and tension tiebacks.

B. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.
   1. Have test loading observed by a qualified professional engineer responsible for design of excavation support and protection system.

C. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.5 BRACING

A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
   1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
   2. Install internal bracing if required to prevent spreading or distortion of braced frames.
   3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 FIELD QUALITY CONTROL

A. Survey-Work Benchmarks: Resurvey benchmarks regularly during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open.

Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.

C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.7 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.
   1. Remove excavation support and protection systems to a minimum depth of 60 inches below overlying construction and abandon remainder.
   2. Fill voids immediately with approved backfill compacted to density specified in Section 31 20 00 – Earth Moving.
   3. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.

B. Leave excavation support and protection systems permanently in place.

END OF SECTION 31 50 00

ITEM 627.0032 25 EXTERIOR IMPROVEMENTS

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment and services necessary to complete the work as indicated on the Contract Plans and the attached Specification Summary.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0032 25 **EXTERIOR IMPROVEMENTS**

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 32 92 00 – TURF AND GRASSES

6.02 This item shall include, but not be limited to, the following:

A. Proper seeding and mulching in accordance with seeding schedule included in Section 32 92 00 – Turf and Grasses.

SECTION 32 92 00

TURF AND GRASSES

PART 1 - GENERAL

1.1 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

D. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

E. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

F. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

H. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.2 SUBMITTALS

A. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

B. Product Certificates: For soil amendments and fertilizers, from manufacturer.

C. Material Test Reports: For imported topsoil existing native surface topsoil.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.
   1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
   2. Experience: Five years' experience in turf installation.
   3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   4. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For existing and imported topsoil proposed for work in this Section, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.
   1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
   2. Report suitability of tested soil for turf growth.
      a. Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
      b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

1.5 PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.
   1. Spring Planting: April 15th to June 15th.
   2. Fall Planting: August 15th to October 15th.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.6 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established as determined by the Authority, but for not less than the following periods:
   1. Seeded Turf: 60 days from date of planting completion.
      a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with New York State Consolidated Agriculture and Markets Law – AGM Article 9

B. General Lawn Seed Mix: NYSDOT 713-04 Seed Mix C

C. Temporary Cover Seed Mix: NYSDOT 713-04 Seed Mix F

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent.
   1. Provide lime in form of ground dolomitic limestone or calcitic limestone.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
   1. Organic Matter Content: 50 to 60 percent of dry weight.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, with a pH range of 3.4 to 4.8.

2.4 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.5 PLANTING SOILS

A. Planting Soil: Imported ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1-inch or larger in any dimension and other extraneous materials harmful to plant growth. Mix ASTM D 5268 topsoil with soil amendments and fertilizers in amounts recommended in the soil test reports by a qualified soil testing agency.

B. Planting Soil: Existing, native surface topsoil formed under natural conditions and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth. Existing topsoil shall be mechanically screened.
   1. Supplement with imported ASTM D 5268 topsoil planting soil when quantities are insufficient.
   2. Mix existing, native surface topsoil with soil amendments and fertilizers in amounts recommended in the soil test reports by a qualified soil testing agency.

2.6 MULCHES

A. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

B. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.7 PESTICIDES

A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the

germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
   3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by the Authority and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
   1. Protect adjacent and adjoining areas from hydro-seeding and hydro-mulching overspray.
   2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off the Authority's property.
   1. Thoroughly blend planting soil before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.

a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
b. Mix lime with dry soil before mixing fertilizer.

2. Spread planting soil to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off the Authority's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus ½-inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

E. Moisten the prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, obtain the Authority's and authorities having jurisdiction acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
1. Do not use seed that is wet, moldy, or otherwise damaged.
2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 4 lb/1,000 sq. ft. or as recommended by the seed supplier.

C. Rake seed lightly into top 1/8-inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with slopes not exceeding 1:4 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.

3.5 HYDRO-SEEDING

A. Hydro-seeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until it is uniformly blended into homogeneous slurry suitable for hydraulic application.
   1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
   2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1,500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.6 TURF RENOVATION

A. Renovate existing turf.

B. Renovate existing turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
   1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
   2. Install new planting soil as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Mow, dethatch, core aerate, and rake existing turf.

F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off the Authority’s property.

H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

I. Apply soil amendments and initial fertilizers required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.

J. Apply seed and protect with straw mulch as required for new turf.

K. Water newly planted areas and keep moist until new turf is established.

3.7 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade

and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1-inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow grass to a height of 2 inches when average height of grass is 3 inches.

D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1,000 sq. ft. to turf area.

3.8 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by the Authority and the Authority's Representative:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

C. Heavy rain events, temperature extremes, and other acts of nature will not exempt the Contractor from the requirement to establish satisfactory turfs and grasses.

3.9 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Authority's operations and others in proximity to the Work. Notify the Authority before each application is completed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

END OF SECTION 32 92 00

ITEM 627.0033 25 **UTILITIES**

1. DESCRIPTION:

1.01 Furnishing, installing, testing, and placing into service sanitary sewer force main piping, including pipe, fittings, valves, air release assemblies, joint restraint and thrust restraint systems, tracer wire, detectable warning tape, utility markers, excavation, bedding, backfill, compaction, sewer flow control and bypass pumping, surface restoration, and all testing and inspection in accordance with Section 33 31 23 – Sanitary Sewerage Force Main Piping, Section 33 31 22 - Testing Of Sanitary Sewer Mains And Manholes, and Section 33 01 30 – Operation and Maintenance of Sewer Utilities.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as NYSTA may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0033 25 UTILITIES

6. SPECIFICATION SUMMARY

6.01 This Item includes the following specifications:

A. Section 33 01 30 – OPERATION AND MAINTENANCE OF SEWER UTILITIES

B. Section 33 01 30.72 – CURED IN PLACE PIPING

C. Section 33 31 22 – TESTING OF SANITARY SEWER MAINS AND MANHOLES

D. Section 33 31 23 – SANITARY SEWERAGE FORCE MAIN PIPING

E. Section 33 34 56 – DOSING CHAMBERS

6.02 This item shall include, but not be limited to, the following:

A. Furnishing and installing force main pipe, fittings, hangers, and supports.

B. Furnishing and installing cured in place pipe lining for 40-ft of 30-inch ACM pipe under the Thruway.

C. Joint restraint, thrust restraint, tracer wire, detectable warning tape, and utility markers.

D. Installation of valves, valve boxes and appurtenances.

E. Hydrostatic pressure testing, leakage testing, and all required inspection and testing.

F. Startup, flushing, and return to service.

G. Furnishing and installing siphons and associated piping in the sand filter dosing chamber

H. Traffic Control shall be paid under Item 627.0001 25 – General Requirements

I. Bypass pumping and hauling required to maintain plant operations shall be paid under Item 627.0001 and not separately measured or paid under this Item.

J. Excavation, bedding, backfill, dewatering, erosion and sedimentation controls, and surface restoration associated with this work shall be paid under Item 627.0031 25 – Earthwork and are not separately measured or paid under this Item.

SECTION 33 01 30

OPERATION AND MAINTENANCE OF SEWER UTILITIES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this section.

1.2 SUMMARY

A. Section Includes:
   1. Sewer Flow Control

B. Related Requirements
   1. Section 01 52 00 – Maintenance of Plant Operations During Construction.

1.3 SUBMITTALS

A. Sewer Flow Control
   1. Sewer Flow Control Plan showing:
      a. Schedule
      b. Schematic Drawing
      c. List of Equipment with:
         1) Pump size, capacity, and quantity
         2) Pipeline sizes and materials
      d. Emergency Procedures

1.4 QUALITY ASSURANCE

A. Minimum of 5 years' experience on similar projects with similar pipe lengths and diameters.

1.5 NOTIFICATIONS

A. Notify the Owner a minimum of 5 days before the anticipated beginning of all sewer activities. Notify Owner at least 24 hours prior to implementing any sewer flow control system.

PART 2 – PRODUCTS

2.1 GENERAL

A. The sewer flow control system shall provide adequate capacity and size to handle existing flows plus additional flows that may occur during periods of rain. The peak amount of flow to be bypassed and provide bypass flow capacity is 8,000 gpd.

B. Piping:

1. Material:
    a. Small diameter flexible pipe may be used for low pressure and low flow conditions from 8-inch and smaller gravity sewer lines, as approved by the Engineer.
    b. Pipe material shall have a pressure rating of at least 1.5 times the operating pressure.
    c. Pipe material may be reused for subsequent flow bypass pumping system placements.

C. Bypass Pumps shall:
1. Be fully automatic, self-priming units that do not require the use of foot valves or vacuum pumps in the priming system.
2. Have a solids handling design with the ability to pump minimum 3-inch diameter solids.
3. Be able to run dry for long periods of time to accommodate cyclical nature of flows.
4. Be equipped to minimize noise. Noise levels shall not exceed 86 dBA at a distance of 50 feet from the source and, if more stringent, comply with all local noise ordinances.
5. Have on standby pump of each size used available onsite.

D. Electric Power Generators shall:
1. Be able to simultaneously start and run all electric powered pumps required for the flow to be controlled.
2. Be equipped to minimize noise. Noise levels shall not exceed 86 dBA at a distance of 50 feet from the source and, if more stringent, comply with all local noise ordinances.
3. Include automatic transfer switch if the flow control system is to operate unattended.

PART 3 – EXECUTION

3.1 SEWER FLOW CONTROL

A. Performance Requirements
1. Provide, maintain, and operate temporary facilities such as dams, plugs, pumping equipment, pipes, conduit, and necessary power to intercept sewage flow before it reaches the area of Work.
2. Properly size all equipment, components, and appurtenances to maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers, and that will protect public and private property from discharge or damage.
    a. The Contractor shall be solely responsible for all cleanup, damages, and resultant fines in the event of a backup or spill. In the event of a backup or spill, the Contractor shall immediately notify the Owner and begin clean-up procedures.
3. All sewage materials removed shall be disposed of in compliance with all applicable laws and regulations and in a manner approved by Owner
    a. Any discharge of sewage into the construction trench shall not be permitted.

B. General
   1. Operate and maintain sewer flow control systems 24 hours per day, 7 days per week, including holidays, as required, to control flow.
      a. Repair crews shall be available 24 hours per day, seven days per week basis
   2. If flow reaches peak estimated flow that flow control system was designed for, stop all work, utilize standby pumps and piping as needed to prevent sewer backup until flow subsides.
   3. After the Work is completed and influent is connected to the plant, remove temporary equipment.

C. Proposed Flow Control Schedule
   1. Fully empty and clean the sludge holding tank
   2. Divert flow from existing influent manhole to the sludge holding tank
   3. Fully empty and dispose of remaining material in the plant in accordance
   4. Throughout construction, utilize a septic hauling company to empty the sludge holding tank as needed, minimum weekly, and dispose at an owner approved facility in accordance with Section 01 52 00 – Maintenance of Plant Operations During Construction.

D. Plugging or Blocking
   1. Flow control may consist of blocking flow with mechanical or pneumatic plugs if only a small amount of flow needs to be controlled and adequate storage is available. Plugging or blocking of flow must be pre-approved by the Owner.
   2. Use primary and secondary plugs for each flow control location.
   3. When blocking flow is no longer needed for performance and acceptance of the Work, remove plugs in a manner that permits sewage flow to slowly return to normal without surcharging or causing other major disturbances downstream.
   4. Remove temporary plugs at end of each working day and restore normal flow. If downstream work is not or cannot be complete during the workday, provide, operate, and maintain a bypass pumping system.
   5. Use bypass pumping if the Work cannot be scheduled at a time when flow is low or completed during a low flow period.

E. Bypass Pumping
   1. When blocking flow in upstream sewer is not appropriate or allowed by the Owner, use flow bypass pumping for reducing flow below the maximum depth or completely bypassing flow.
   2. Design, furnish, install, and maintain all power, primary, and standby pumps, appurtenances, tanks, tucks, and bypass piping required to maintain existing flows and services.
   3. The Contractor shall obtain approval and secure all permits for placement of temporary bypass pumping systems and pipelines within public right-of-way.
   4. Site Verification
      a. Locate existing utilities in the area of bypass pipelines.
      b. Minimize disturbance of existing utilities
      c. Confine bypass discharge pipeline within public rights-of-way, temporary construction easement, or permanent easement.

d. When bypass pipeline crosses local streets and private driveways, place bypass pipeline in a trench and cover with temporary pavement.
e. Installation of bypass pipelines is prohibited in riparian/wetland areas unless approved by the Owner.

5. Flow bypass shall be done in such a manner that will not damage private or public property or create a nuisance or public menace. Pumped sewage shall be in an enclosed pipe that is adequately protected from traffic and shall be redirected into an enclosed tank for hauling. Dumping or free flow of sewage on private or public property, gutters, streets, sidewalks, or into storm sewers is prohibited.
6. The Contractor shall equip pump engines with noise suppression devices to keep pump noise to a minimum and comply with applicable noise ordinances.

F. Field Quality Control and Maintenance
1. The Contractor shall perform a leakage pressure test of the bypass pumping discharge piping using clean water prior to actual operation. Prior to operation, test each section of discharge piping with maximum pressure equal to 1.5 times the maximum operating pressure of the system. The Owner shall be given 24 hours' notice prior to testing.
2. The Contractor shall inspect bypass pumping system every 2 hours to ensure that the system is working correctly.
3. The Contractor shall ensure that the temporary pumping system is properly maintained and a responsible operator shall always be on hand when pumps are operating.

G. Cleaning
1. Before bypass pumping systems are broken down and moved to the next section or removed at the completion of the Work, discharge sewage remaining in bypass discharge pipeline and pumping equipment to working sewer. Sewage shall not be spilled or discharged to the ground or environment.
2. Upon completion of bypass pumping operations, clean disturbed areas and restore to previous conditions or better, including pavement restoration.

END OF SECTION 33 01 30

SECTION 33 01 30.72

CURED-IN-PLACE PIPE LINING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Cleaning and flushing of existing sanitary sewers.
2. Taking video of existing sewers and their condition.
3. Installing an inverted, resin-impregnated tube pipe liner.
4. Reestablishing service connections.

B. Related Requirements:
1. Section 03 60 00 – Grouting
2. Section 31 23 16 – Excavation
3. Section 33 31 22 – Testing of Sanitary Sewer Mains and Manholes
4. Section 33 31 23 – Sanitary Sewer Force Main Piping

1.2 REFERENCE STANDARDS

A. ASTM International:
1. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
2. ASTM D5260 - Standard Classification for Chemical Resistance of Poly(Vinyl Chloride) (PVC) Homopolymer and Copolymer Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
3. ASTM D5813 - Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems.
4. ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
5. ASTM F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).
6. ASTM F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP).

1.3 COORDINATION

A. Coordinate Work of this Section with the Director’s Representative.

B. Notify Director’s Representative at least **48** hours in advance of expected disruption of sanitary service.

C. Notify private sanitary sewer users at least **48** hours in advance of expected disruption of sanitary service.

D. Limit disruption of service to individual properties to one-time occurrence for maximum of **eight** hours.

E. Do not disrupt sewer service between hours of **5:00** PM and **8:00** AM unless otherwise indicated by the Director's Representative.

F. Provide and maintain temporary facilities, including piping and pumps, to meet requirements.

1.4 PREINSTALLATION MEETINGS

A. Meet with the Director's Representative a minimum **one week** prior to commencing Work of this Section.

1.5 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer's installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combination submittals).

D. Product Data:
1. Submit manufacturer information regarding liner material, curing chemicals, and lubricants.
2. Manufacturer's technical data, details, and specifications giving information on material composition, physical properties, and dimensions, including certification by the manufacturer that the materials are immune to corrosion from sewage and products resulting from the biological and chemical conversion of sewage constituents. Manufacturer's recommended procedures for handling, storing, and installation of the liner, including reinstatement of lateral service connections.
3. Submit complete description of proposed wet-out procedures.

E. Shop Drawings: Indicate liner dimensions for each pipe size to be relined.

F. Design Calculations:
1. For the rehabilitation of sewers by the inversion and curing of a resin-impregnated tube, submit structural design calculations and specification data sheets listing all parameters used in the liner design and thickness determinations based on Appendix X1 of ASTM F 1216. Calculations shall be stamped and signed by a New York State licensed professional Engineer.

G. Samples: Submit **two** samples of liner material in both uncured and cured state.

H. Digital Video Discs (DVDs) or USB Drive:
1. Submit video recordings of piping sections as follows:
   a. Show condition of existing pipe and pipe joints and location of existing service connections after cleaning and prior to relining.

b. Show cured liner and reestablished service connections after relining Work has been completed.

2. Pre- and Post- CCTV inspection shall be completed in accordance with Section 33 05 05 – Testing of Sanitary Sewer Mains and Manholes.

I. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

J. Delegated Design Submittals: Submit Shop Drawings signed and sealed by a New York State licensed professional engineer with design calculations and assumptions for liner thickness.

K. Test and Evaluation Reports: Submit reports certifying that liner material meets ASTM testing standards as specified in this Section.

L. Manufacturer Instructions:
1. Submit detailed description of liner placement and curing procedures for piping.
2. Include description of procedures for sealing liner material at manholes and reestablishing service connections.
3. Submit manufacturer's requirements for receiving, handling, and storage of materials.

M. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
1. Test Reports: Furnish certified test data issued by an independent testing laboratory, demonstrating that the products used comply with the required physical properties.

N. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

O. Qualifications Statements:
1. Submit qualifications for manufacturer, installer, licensed professional, pipeline assessor, and inspector.
2. Submit manufacturer's approval of installer.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of each service connection.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum **three** years' **documented** experience.

B. Workers' Qualifications Data:
1. Submit the names and addresses of three (3) previous trenchless sewer rehabilitation projects comparable in all ways to this project. Briefly describe the nature of each project.
2. Submit a letter certifying that the Supervisor and the Workers doing the liner Work have at least 2 years' experience each in installing liners of the type specified to sewers.

C. Licensed Professional: New York State licensed professional Engineer experienced in design of specified Work.

D. Pipeline Assessor:

1. Person specializing in assessing condition of sewer pipelines prior to and following relining.
2. Currently certified in Pipeline Assessment and Certification Program (PACP) of the National Association of Sewer Service Companies (NASSCO).

E. Inspector:
1. Director's Representative will provide a qualified inspector specializing in sewer pipeline rehabilitation.
2. Currently certified in Inspector Training and Certification Program (ITCP) of NASSCO.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer instructions.

C. Protection:
1. Protect materials from moisture and dust by storing them in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.9 EXISTING CONDITIONS

A. Field Measurements:
1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

1.10 WARRANTY

A. Furnish **two**-year manufacturer's warranty for liner.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

A. Design lining material to have sufficient structural strength to support dead loads, live loads, and groundwater load imposed, assuming existing pipe cannot share loading or contribute to structural integrity of liner.

B. Design liner to least-possible thickness to minimize decreasing interior pipe diameter.

C. Design liner material to provide jointless, continuous, and structurally sound construction able to withstand imposed static, dynamic, and hydrostatic loads on a long-term basis.

D. Identify design provisions for shrinkage control to prevent future misalignment of service reconnections.

2.2 INVERTED, RESIN-IMPREGNATED TUBE PIPE LINER

A. Cured-in-Place, Resin-Impregnated Felt Liner:
   1. Resin-Impregnated, flexible polyester felt thermally cured-in-place and meeting the following minimum physical properties:
      a. Flexural Modulus: 300,000 psi initial; 150,000 psi long-term.
      b. Flexural Strength: 5000 psi.
      c. Tensile Modulus: 250,000 psi initial; 152,000 psi long-term.
      d. Tensile Strength: 4000 psi.

B. Custom designed by the manufacturer in accordance with ASTM F 1216 to meet the following conditions:
   1. AASHTO H-20 live load with two trucks passing.
   2. Soil weight 120lbs./cf.
   3. Maximum ground water level at ground surface.
   4. Consideration of partially or fully deteriorated pipe based on the video inspection following cleaning of the host pipe.
   5. 50-year service life.
   6. Maximum felt content of the liner: 25 percent.
   7. SDR of 50 or less dependent on deteriorated condition of host pipe. Wall thickness of the cured liner shall be determined by the design calculations required under Article 1.04 or this Section.

C. Resin shall be a polyester liquid thermosetting resin with associated catalysts suitable for the design conditions and curing process.

D. When cured the liner shall form a continuous, tight fitting, hard, impermeable lining chemically immune to corrosion from sewage and by-products, combined with a maximum abrasion resistance.

E. Fabricate the liner to a size that when reformed will tightly fit the host pipe.
   1. Tube shall consist of one or more layers of flexible needled felt, or an equivalent non-woven material.
   2. Tube shall be capable of conforming to bends, offset joints, bells, and disfigured pipe sections.
   3. Allow for longitudinal and circumferential expansion when sizing to achieve proper installation of the liner.
   4. Verify dimensions in the field prior to delivery of the liner.

F. Verify length of liner prior to construction to effectively carry out installation and seal the liner at the inlet and outlet of each manhole.

G. Ensure that the correct liner is fabricated for the respective runs between each set of manholes.

H. Acceptable Licensed Installers:

   1. Arold Construction Company, INC. - Kingston, NY
   2. Approved equivalent submitted in accordance with 01 33 00

I. Description:
   1. Fabric Tube:
      a. One or more layers of absorbent, non-woven felt fabric, felt/fiberglass, or fiberglass.
      b. Comply with ASTM D5813 and F1216, F1743, or F2019.
      c. Capable of absorbing and carrying resins.
   2. Resin:
      a. Corrosion-resistant polyester or vinyl ester resin and catalyst system.
      b. Comply with ASTM F1216, F1743, or F2019.
   3. Wet-Out Fabric Tube:
      a. Furnish uniform thickness and excess resin distribution that, when compressed at installation pressure, will meet or exceed design thickness after cure.

2.3 MIXES

A. Grout: As specified in Section 03 60 00 – Grouting.

2.4 SOURCE QUALITY CONTROL

A. Inspection and Testing:
   1. Provide shop inspection and testing of completed assembly.
   2. Chemical and Physical Testing: Test cured samples according to ASTM D5260.

B. Director’s Representative Inspection:
   1. Make liner products available for inspection at manufacturer's factory prior to packaging for shipment.
   2. Notify Director’s Representative at least [**seven**] days before inspection is allowed.

C. Director’s Representative Witnessing:
   1. Allow witnessing of factory inspections and tests at manufacturer's test facility.
   2. Notify Director’s Representative at least [**seven**] days before inspections and tests are scheduled.

D. Certificate of Compliance:
   1. If manufacturer is approved, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
   2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify location of piping to be relined.

3.2 PREPARATION

A. Pre-Rehabilitation Inspection: Following thorough cleaning, conduct a video survey, in the presence of the Director’s Representative, of each sewer section cleaned to verify adequacy of the cleaning in accordance with these specifications.

1. Conduct closed-circuit video inspection as specified in Section 330130.11 - Television Inspection of Sewers.
2. Determine condition of existing piping, degree of offset of joints, and locations of crushed walls and obstructions.
3. Determine sizes and locations of service entrances and connections.
4. Evaluation of pipe conditions performed by pipeline assessor.
5. Inspection of Work performed by a NASSCO ITCP-certified inspector. Coordinate inspection work to be provided by the Director's Representative.
6. Clear obstructions, service piping protrusions, and other materials from bottom of existing pipe to ensure that inserted pipe liner directly contacts existing pipe wall.

B. Bypassing Sewage:
1. Set up bypassing pump system to isolate each section of piping for relining.
2. Maintain bypass pumping until lining is totally formed and service connections have been reestablished.

3.3 CLEANING

A. Remove foreign materials from the sewer piping as required to obtain tight seating of the new liner against a cleaned interior wall surface throughout the host pipe.
1. Use hydraulically propelled, high velocity jet, or mechanically powered equipment as necessary to satisfactorily remove dirt, grease, rocks, sand and other foreign materials including obstructions per Manufacturer's recommendations.
2. Remove roots in a manner assuring complete removal from the joints.
   a. Use mechanical equipment such as rodding machines, bucket machines, and winches in connection with root cutters and porcupines, plus other equipment such as high-velocity jet cleaners.
   b. Chemical root treatment with a herbicide approved by the Director's Representative may be used at the Contractor's option to aid in the removal of roots. Application shall be in accordance with the manufacturer's printed recommendations and instructions. Damaged vegetation as designated by the Director's Representative shall be replaced at no cost to the State.
3. Obtain from the Director's Representative written approval of the proposed equipment and methods to be used in the cleaning operations.
4. If cleaning an entire section between any two manholes cannot be successfully performed from one of the manholes, the equipment shall be set up at the other manhole and cleaning attempted from the other direction. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire distance between the two manholes, it will be assumed that a major blockage and the cleaning effort shall be abandoned until the blockage is removed by open-cut excavation. Coordinate any major blockages with the Director's Representative.
5. Debris of every name and nature from sewer cleaning operation shall be legally disposed of off Site.

3.4 LOCALIZED (POINT) REPAIRS

A. Localized (point) repairs shall be at the locations shown on the Contract Drawings. Coordinate with Director's Representative following initial cleaning and CCTV inspection of any

Blockages or damage identified which are not shown on the Contract Drawings.

B. Clear the existing pipeline of obstructions that will in any way prevent proper and specified installation of the liner. Offsets at the joints of more than 2 inches of inside diameter, protruding service connections, dropped joints, collapsed pipe, and other reductions in cross-sectional area of more than 20 percent of the inside diameter of the existing pipeline shall be repaired prior to lining.

C. If an obstruction cannot be removed by conventional methods, then point repair shall be made by open-cut excavation.
   1. Pipe used in an open-cut repair section shall be PVC, SDR 35, conforming to ASTM D 3034.
   2. The following types of pipe couplings may be used provided they give a watertight seal, are designed to mate dissimilar pipes, and will achieve a solid connection.
      a. Coupling adapter.
      b. Slip-on coupling.
      c. Split repair sleeve.
   3. Flexible connectors are not acceptable.

3.5 INSTALLATION

A. Adhere strictly to the liner manufacturer's standard procedures for proper installation under specific conditions. Procedures for liner installation are specific to the method used and vary with liner material, liner thickness, pipe size, pipe shape, etc.

B. Cover irregular and sharp edges of the entrance to the host pipe to prevent damage to the liner during insertion.

C. Installation of Inverted, Resin-Impregnated Tube Liner:
   1. Resin-Impregnation (wet-out):
      a. Protect tube and resin areas from sunlight and moisture.
      b. Test operation of mixing and wet-out equipment prior to resin mixing to ensure that all components are in proper working order.
      c. Following resin mixing, verify that resin temperatures have been taken and gel tests (accelerated curing tests of the resin reactivity) have been performed for proper evaluation of the resin mixture.
      d. Pump the resin between the innermost layers of the tube. Verify by counting the tube layers.
      e. Do not allow air entrainment in the wet-out process.
      f. Pass the tube through a pair of rollers to uniformly distribute the resin. Gap spacing between the rollers shall be a minimum of twice the specified wall thickness of the cured-in-place liner. Verify the gap spacing with every 100 feet of wet-out.
   2. Inversion:
      a. Protect the tube from injurious impact and unclean soiling matter (dirt, mud, fine debris, etc.).
      b. Use inversion heads sized according to manufacturer's recommendations.
      c. Do not overstress the tube material or exceed 5 percent longitudinal stretch.
      d. Place thermocouples at both ends of the tube and at intermediate stations as required to monitor the curing process.

e. Remove plastic films or coatings on the interior finish of the liner unless they are fully bonded to the absorbent tube material prior to installation.
f. Allow the liner to cool below 100 degrees F. before releasing the pressure and cutting the ends.

D. Excavate for point repairs only on emergency basis and as required by the Director's Representative.

E. Perform relining and reestablish service connections without need for excavation while minimizing disruptions to **adjacent occupied buildings and traffic**.

F. Inverted, Resin-Impregnated Tube Pipe Liner:
1. Coat **outside or inside** layer of fabric tube (before inversion or pull-in, as applicable) with an impermeable, flexible membrane that will contain resin and facilitate, if applicable, vacuum impregnation and monitoring of resin saturation during resin impregnation (wet-out) procedure.
2. Prior to installation, and as recommended by manufacturer, place remote temperature gages or sensors inside host pipe to monitor temperature during cure cycle.
3. Positioning:
   a. Position wet-out tube in pipeline using method specified by manufacturer.
   b. Do not damage tube during installation.
4. Cure installed liner by using appropriate medium according to manufacturer's recommended cure schedule.
5. Allow installed pipe liner to cool according to manufacturer instructions.
6. Annular Spaces:
   a. Verify that no gap or annular space exists between finished liner and existing pipe.
   b. Grout annular space, if present, to prevent damage to or collapse of liner or service connections.
   c. Install watertight seals to host pipe at beginning and end of installed liner.

G. Service Connections:
1. Reestablish existing sewer service connections through use of closed-circuit television camera and remote-controlled cutting device.
2. Match invert of reestablished service with previously existing invert.
3. Maintain minimum of 95 percent to maximum of 100 percent of original service connection opening.
4. Reestablish sewer service connection with uniform cuts free of burrs and sharp edges.
5. After reestablishing service connection, flush piping clean.

3.6 FIELD QUALITY CONTROL

A. Testing of Completed Pipe Liner:
1. As specified in Section 33 31 22 – Testing of Sanitary Sewer Mains and Manholes.

B. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section on Site for installation, inspection, and field testing.

C. Post-Rehabilitation Inspection: Conduct a video survey, in the presence of the Director's

Representative, of each rehabilitated sewer section to verify adequacy of the liner installation and repairs in accordance with these specifications.

D. Liner Acceptance:
   1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
   2. If liner fails to form, remove failed liner and install new liner.
   3. Conduct closed-circuit video inspection of completed relining Work, indicating no visual defects, including foreign inclusions, dry spots, pinholes, cracks, or delamination.
   4. Confirm that service connections are complete and unobstructed.
   5. No infiltration of groundwater is permitted.
   6. Make final adjustments to liner under direction of manufacturer's representative.

E. Furnish installation certificate from manufacturer's representative attesting that liner has been properly installed and is ready for startup and testing.

END OF SECTION 33 01 30.72

SECTION 33 31 22

TESTING OF SANITARY SEWER MAINS AND MANHOLES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and DIVISION 01 specifications sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Hydrostatic and Leakage Testing for Pressure Sewer Piping.
2. Infiltration and Exfiltration Testing for Gravity Sewer Piping.
3. Vacuum Testing of Manholes.
4. Exfiltration Testing of Manholes.
5. Low Pressure Air Testing of Gravity Sewer Pipe.
6. Mandrel Testing.

B. Related Requirements:
1. Section 33 01 30 – Operation and Maintenance of Sewer Utilities
2. Section 33 31 23 – Sanitary Sewer Force Main Piping

1.3 SUBMITTALS

A. For each test to be performed, submit as applicable:
1. Testing procedures.
2. List of test equipment.
3. Testing sequence schedule.
4. Provisions for disposal of flushing and test water.
5. Certification of test gage calibration.

B. Qualifications statement for each testing agency engaged by the Contractor.

1.4 QUALITY ASSURANCE

A. No testing shall be performed without the Owner present.

PART 2 – PRODUCTS

2.1 REQUIRED EQUIPMENT

A. Hydrostatic Testing
1. Pressure Pump
2. Pressure Hose
3. Water Meter
4. Test Connections

5. Pressure relief Valve
6. Pressure Gage: Calibrated to 0.1 psi

B. Infiltration and Exfiltration Testing
1. Plugs
2. Pump
3. Measuring Device
4. Weirs

C. Vacuum Testing
1. Vacuum Pump
2. Vacuum Line
3. Vacuum Tester Base
4. Shutoff Valve
5. Stopwatch
6. Plugs
7. Vacuum Gage: Calibrated to 0.1 in Hg

D. Low Pressure Air Testing
1. Air Compressor
2. Air Supply Line
3. Shutoff Valves
4. Pressure Regulator
5. Pressure Relief Valve
6. Stopwatch
7. Plugs
8. Pressure Gage: Calibrated to 0.1 psi

E. Mandrel Testing
1. Mandrel
   a. The mandrel is to be 95% of the inside diameter of the section of pipe being tested.
   b. Inside diameter used for selection of mandrel shall be exact and not nominal.
2. Pull Ropes

PART 3 – EXECUTION

3.1 PREPARATION

A. No testing shall be performed until any component of the sewer system being tested is completely installed and backfilled in accordance with these specifications.

B. Testing of completed sections of sewer construction prior to the completion of all construction is acceptable provided that all components associated with the test being performed have been completely installed and backfilled in accordance with these specifications.

C. Prior to testing any section of gravity pipe, that section of pipe shall be lamped.
1. Lamping shall consist of placing a light at one end of a gravity pipe and observing

it from the other end.

2. If the lamp is not visible from the other end or the full circle of the gravity pipe on the other end is not visible, then the gravity pipe is not correctly installed to consistent line and grade.
3. Remove and reinstall sections of gravity pipe not installed to consistent line and grade.

3.2 HYDROSTATIC AND LEAKAGE TESTING FOR PRESSURE SEWER PIPING

A. Hydrostatic and Leakage Testing shall be performed on all pressure sewer pipe.

B. Prior to Hydrostatic and Leakage Testing:
1. Ensure that all pipe, valves, and branches have been installed and backfilled.
2. Check all valves for the proper open/close position in the test area prior to testing.
3. Install access points and valves prior to testing.

C. Hydrostatic and Leakage Testing shall be in compliance with AWWA C600 or C605.

D. Subject the pipe to a minimum pressure of 150% of design operating pressure being measured at the lowest point of the section of pipe to be tested.

E. The duration of the hydrostatic test shall be no less than two hours. Observe exposed pipes, valve, and other appurtenances for cracks and defects. If defective materials are found, cease hydrostatic testing and replace the defective materials. Correct visible deficiencies and continue testing at same test pressure for an additional two hours to determine leakage rate.

F. The testing pressure shall not vary by more than ±5 psi for the duration of the test. Test pressure shall be maintained within this tolerance by adding makeup water through the pressure test pump into the pipeline.

G. The amount of makeup water added shall be accurately measured in gallons by suitable method and shall not exceed the quantities shown in Table 1 below. Correct visible leaks regardless of quantity of leakage.

Table 1: Allowable Leakage Over Two Hours by Pipe Size

Pipe Size (Inches)	Leakage per 1,000 LF (Gallons)	Pipe Size (Inches)	Leakage per 1,000 LF (Gallons)
4	0.4	21	2.1
6	0.6	30	2.8
8	0.8	36	3.3

3.3 VACUUM TESTING OF MANHOLES

A. Vacuum Testing shall be performed on all sewer manholes.

B. Prior to Vacuum Testing, ensure all manhole components have been installed and

backfilled as specified, including all required sealant and manhole frame/cover assembly.

C. Vacuum testing shall be in compliance with ASTM C1244.

D. Plug all pipe openings in the manhole to be tested and place the vacuum base over the frame and cover of the manhole. Connect to the vacuum pump to the vacuum base outlet port, draw vacuum to 10 in Hg, and close the vacuum base valve.

E. The duration that the manhole shall be tested depends on the size of the manhole:
1. Manhole diameter of 4 feet: 60 seconds
2. Manhole diameter of 5 feet: 75 seconds
3. Manhole diameter of 6 feet: 90 seconds
4. For manholes greater than 6 feet diameter or non-circular structures, consult Owner for requirements.

F. Record the drop in vacuum pressure over the test period.
1. If the vacuum drop is greater than 1 in Hg during the test period, the manhole shall be repaired and retested.
2. If the vacuum drop is less than 1 in Hg during the test period, the manhole is acceptable.

G. If unsatisfactory testing results are achieved, repair manhole and retest until results meet these specifications.

3.4 EXFILTRATION TESTING OF CONCRETE STRUCTURES

A. This test method is a substitute for vacuum testing concrete structures only when vacuum testing is not feasible, such as pump station wet well structures (including precast, cast-in-place, or other). This is not a routine test for concrete manholes and vaults, and shall only be performed where specified or where approved by the Owner.

B. Exfiltration Test shall be performed in accordance with ASTM C969 – “Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines”.

C. Preparation:
1. Prior to testing, ensure the structure is completely installed and backfilled as specified, including all penetrations installed, influent & effluent pipes connected, anchor bolts and other hardware installed, and coatings have been allowed to dry per manufacturer’s recommendation.
2. Plug all openings in the structure to be tested.
3. Groundwater level shall be monitored and shall be maintained to be at least 3-foot below the water test elevation for the entire test period.

D. Test Procedure:
1. Fill the structure to the top of the opening with potable water.
2. Allow concrete structures to saturate for a minimum of 4 hours, up to 72 hours. Refill structure with additional water.

3. Replace cover or close hatches to push out any water that may be displaced when the opening is closed. Reopen hatch and mark the water level. Close opening for test.
4. Test period shall be a minimum of 24 hours.
5. Once the test begins the opening shall only be removed in the presence of the Owner.
6. Exfiltration volume will be determined by measuring the amount of water required to raise the water level back to the marked level.

E. Allowable leakage limit in gallons is (0.1 gallon) (feet of diameter) (feet of head) (hours of test).
1. Example:
   a. For a wet well that is 8-foot diameter, 20-foot deep from rim to floor, and groundwater is 5’ above the lowest point of the wet well.
   b. Leakage Limit = 0.1-gal x 8’ dia. x (20’-5’) head x 24 hours = 288 gallons

F. If unsatisfactory testing results are achieved, repair structure and retest until results meet these specifications.

3.5 LOW PRESSURE AIR TESTING OF GRAVITY SEWER PIPE

A. Low Pressure Air Testing shall be performed on all gravity sewer pipe less than 18-inch diameter. For pipes greater than 18-inch diameter, consult and obtain approval from Owner.

B. Prior to Low Pressure Air Testing ensure that all pipe, service taps, and manholes have been installed and backfilled as specified.

C. Low Pressure Air Testing shall be in compliance with ASTM F1417.

D. Plug all pipe connections to manholes, service laterals, cleanouts, or any other pipe connection that will allow air to escape the portion of pipe being tested.

E. Determine the groundwater elevation above the spring line of piping.

F. Introduce air pressure slowly to approximately 4 psig. For every foot of groundwater above the spring line of the pipe being tested, increase starting air test pressure by 0.43 psi. Do not increase starting air test pressure to above 10 psig. Allow pressure to stabilize for five minutes.

G. The duration that the section of pipe shall be tested depends on the size and length of the section of pipe and can be found in Table 3 below.

Table 3: Low Pressure Air Minimum Testing Duration	
Pipe Size	Duration per 100 ft
(Inches)	(Minutes)
4	0.3
6	0.7
8	1.2

H. Record the drop in pressure over the duration of the testing period.
   1. If air pressure drops more than 0.5 psi during the testing period, the piping has failed and the pipe section has failed and shall be repaired and retested.
   2. If air pressure does not drop more than 0.5 psi during the testing period, the piping is acceptable.

I. If unsatisfactory testing results are achieved, repair pipe section and retest until results meet these specifications.

3.6 MANDREL TESTING

A. Mandrel Testing shall be performed on all flexible gravity sewer pipe.

B. Prior to Mandrel Testing, ensure that all pipe, service taps, and manholes have been installed and backfilled as specified. Mandrel Testing shall not be conducted until backfill has been in place for a minimum of 24 hours.

C. A sized “go/no go” mandrel with a diameter 95% of the inside diameter of the pipe section being tested shall be pulled by hand through the pipe section being tested. Mechanical methods shall not be used to pull the mandrel through the pipe section.

D. If the mandrel becomes wedged, stuck, or unable to pass any point in the pipe section, then the deflection of that pipe exceeds acceptable deflection and the piping has failed Mandrel Testing.

E. If the mandrel passes through the pipe section without becoming wedge, stuck, or unable to pass any point in the pipe section, the piping is acceptable.

F. If unsatisfactory testing results are achieved, repair pipe section and retest until results meet these specifications.

3.7 FIELD QUALITY CONTROL

A. Testing shall not be performed without the Owner or appointed representative of the Owner present.

B. Engage a qualified agency or persons to perform tests and inspections.

C. Test and inspection reports shall be prepared and submitted as a certification of results.

END OF SECTION 33 31 22

SECTION 33 31 23

SANITARY SEWER FORCE MAIN PIPING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Sanitary sewer force main pipelines.
   2. Valves.

B. Related Requirements:
   1. Section 31 23 16 – Excavation.
   2. Section 33 01 30 – Operation and Maintenance of Sewer Utilities.
   3. Section 33 31 22 – Testing of Sanitary Sewer Mains and Manholes.

1.3 SUBMITTALS

A. Action Submittals:
   1. Complete shop drawings and laying diagrams showing location of each pipe section as requested by the Owner. Drawings shall include:
      a. Pipe dimensions, pipe class, pipe joints, fitting fabrication details, and gasket properties,
   2. For ductile iron pipe indicate coating and lining data including its chemical resistance data.
   3. Sewer flow control plan. See Section 33 01 30 – Operation and Maintenance of Sewer Utilities.

1.4 QUALITY ASSURANCE

A. Materials will be visually inspected by Owner or Inspector at the Site for conformance to the Specifications. At Owner's discretion, Contractor may be required to supply certified mill tests, samples, or other suitable form of verification that the material meets the required specifications. Any material that fails to conform to these Specifications shall be rejected and removed from the project by the Contractor at no cost to the Owner.

B. Installation of materials shall be performed by qualified personnel.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer's instructions.

C. Protection:
1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection, such as UV protection, according to manufacturer instructions.

PART 2 – PRODUCTS

2.1 DUCTILE IRON PIPING

A. All ductile iron piping products shall be manufactured in the United States. Pipe shall conform to AWWA C151, minimum Thickness Class 52. Fittings shall conform to AWWA C110, design pressure of 250 psi for flanged fittings and 350 psi for restrained joint fittings. DIP shall be cement mortar lined unless shown or specified otherwise.

B. Cement mortar linings shall conform to American Standard Specifications for Cement Mortar Lining for Cast Iron Pipe and Ductile Iron Pipe and Fittings, ANSI A21.4 (AWWA C104) and shall be double thickness. The cement mortar lining shall be protected with the bituminous epoxy seal coat. All buried DIP and fittings shall have a bituminous coating on the exterior surfaces in accordance with ANSI A21.51 (AWWA C151) and polyethylene encasement in accordance with AWWA C105.

C. Unless otherwise noted herein or on the Contract Drawings, all exposed ductile iron piping shall have flanged joints.

D. Flanged joints and fittings shall have a minimum pressure rating of 250 psi with 125 lbs American Standard flanges. All flanges and fittings shall conform to the requirements of ANSI B16.1. Flanges shall be ductile iron and shall be of the threaded or screw on type. The face of the flanges shall be machined after installation of the flange to the pipe. No raised surface shall be allowed on flanges. Flanged pipe shall conform to the requirements of ANSI Specification A21.15, (AWWA C115). Pipe lengths shall be fabricated to meet the requirements of the Contract Drawings.

E. Gaskets shall be the "Full Face" type, 1/8-inch minimum thickness, cloth-inserted rubber, red rubber or neoprene and shall be suitable for the service intended. Bolts shall be of the size and length called for in accordance with the "American Standard" and complies with the requirements of the ANSI/AWWA Standards. The bolts for flanged joints shall be a minimum ASTM A307; Grade B carbon steel and be in accordance with ANSI A21.10, (AWWA C110). The bolts shall have hexagonal heads and nuts, no washers shall be used. Bolts and nuts shall be of domestic (United States) manufacture.

F. Bell and spigot pipe shall be provided with push on, O-ring rubber gasket, compression type joints and shall conform to the requirements of ANSI A21.11 (AWWA C111). Fittings and specials shall be supplied with mechanical joints as specified for mechanical joint pipe. If required by installation conditions, pipe shall have cast on lugs for restraint.

G. Mechanical joints and fittings shall conform to the requirements of ANSI A21.11, (AWWA C111). Joints shall be made employing a tapered rubber gasket forced into a tapered groove with a ductile iron follower ring. If required by installation conditions, pipe and fittings shall have cast-on lugs for adequately tying the pipe and fittings together. These shall be in conformance with standard practice and as outlined under the appropriate AWWA Specifications.

H. Bolts for mechanical joints shall be high strength corrosion resistant low-alloy steel tee-head bolts with hexagonal nuts furnished by the pipe manufacturer. Bolts and nuts shall be of domestic (United States) manufacture.

I. All buried pipe and fittings shall have flexible restrained bolted joints. Restrained joint pipe and fittings shall consist of bolted retainer rings and welded retainer bars. Bolts for restrained joints shall conform to ANSI B18.2.

J. The above systems for thrust restraint shall be used where restrained joint ductile iron pipe is specified. Thrust restraint and harnessing systems such as thrust blocks, tie-rods, friction clamps, retainer glands, and other systems shall be EBAA Iron System, or approved equal allowed by the OWNER, and shall be used as shown on drawings. Where tie-rods are required, the rods and tabs shall be designed for the specified design pressure, shall have lengths less than 10 feet between fittings, and shall be stainless steel.

2.2 HANGERS AND SUPPORTS

A. All piping shall be adequately supported and braced by means of hangers, concrete piers, pipe supports, brackets, or otherwise as may be required by the location. Generally, concrete supports shall be used where pipe centerline is less than 3 feet above the floor, and hangers/brackets above 6 feet unless shown otherwise. Supports shall be not more than 10 feet on center for steel, ductile-iron and cast-iron piping, and 4 feet on center for plastic pipes unless otherwise shown on the Contract Drawings or required by the Building Codes. All necessary inserts or appurtenances shall be furnished and installed in the concrete or on structures for adequately securing hangers and supports to the structure.

B. Hangers and supports shall conform to the following requirements:
   1. All hangers and supports shall be capable of adjustment after installation. Types of hangers and supports shall be kept to a minimum.
   2. Hanger rods shall be stainless steel (unless otherwise indicated below), straight and vertical. Chain, wire, strap, or perforated bar hangers shall not be used. Hangers shall not be suspended from other piping.
   3. Vertical piping shall be supported at each floor and between floors on 4-foot centers by stays or braces to prevent rattling and vibration.
   4. Supports and hangers for plastic piping shall include wide saddles or bands as recommended by the manufacturer and approved by the OWNER to distribute load and thus avoid localized deformation of the pipe.
   5. Hanger and supports shall prevent contact between dissimilar metals by use of copper plated, rubber, vinyl coated, or stainless-steel hangers.
   6. Ferrous pipes that do not require painting shall be supported by galvanized hangers and supports.

7. Copper piping shall be supported by plastic coated or copper plated steel hangers and supports.
8. Plastic piping shall be supported by plastic coated steel hangers and supports.
9. Hangers and supports shall provide for thermal expansion throughout the full operating temperature range.
10. Expansion/wedge and adhesive type anchors used for attaching pipe hangers and supports shall be Type 304 stainless steel.

C. All metallic hangers and supports shall be “Grinnel" by ITT Grinnel Corp., "Witch" by Carpenter & Patterson, Inc. Data on the types and sizes to be used shall be furnished to the OWNER for approval. Metal support system brackets, support clips shall be welded steel construction, hot dipped galvanized after fabrication. Hanger rods, washers and nuts for clevis supports shall be 304 stainless steel. Clevis hangers for pipes 4 inches and larger shall be hot dipped galvanized steel.

D. Non-metallic support systems shall be a heavy-duty channel framing system. Channel frames shall be manufactured by the pultrusion process using corrosion grade polyester or vinylester resins. All fiberglass construction shall include suitable ultraviolet inhibitors for UV exposure and shall have a flame spread rating of 25 or less per ASTM E84. Piping accessories, pipe clamps, clevis hangers, support posts, support racks, fasteners, etc., shall be constructed of vinylester or polyurethane resin. Non-metallic support systems shall be standard make Aickinstrut by Aickinstrut, Inc., Unistrut Fiberglass by Unistrut, Inc., Enduro Fiberglass Systems. The CONTRACTOR shall submit data on the types and sizes for OWNER approval. Unless otherwise shown or specified the CONTRACTOR shall provide support spacings in the conformance with the pipe and support system manufacturer's requirements.

E. Provide only new material. Previously used or scrap material not allowed.

2.3 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

A. All PVC Pressure Pipe shall be manufactured from Type I, Grade I unplasticized polyvinyl chloride (PVC) with a cell Classification of 12454-B, and shall conform to the requirements of ASTM D1784 and D1785 standards. The pipe shall be Schedule 80 PVC and shall be manufactured in strict compliance to ASTM D1785, consistently meeting and/or exceeding the Quality Assurance test requirements of this standard with regard to pressure rating, material, workmanship, burst pressure, flattening, impact resistance, and extrusion quality. The pipe shall be manufactured in the USA, using domestic materials, by ISO 9001 certified manufacturer. Pipe shall be product of Charlotte Plastics or approved equal.

B. Joints shall solvent welded as recommended by the manufacturer.

C. All fittings for Schedule 80 pipe shall be one-piece injection molded or fabricated from PVC (Polyvinyl Chloride) meeting ASTM D1784. Joints shall solvent welded as recommended by the manufacturer.

D. Furnish a certificate from the pipe manufacturer stating that they are fully competent to manufacture PVC pipe of uniform texture and strength and in full compliance with these

specifications and further stating that they have manufactured such pipe and done so in sufficient quantities to be certain that it will meet all normal field conditions. In addition, the manufacturer's equipment and quality control facilities must be adequate to ensure that each extrusion of pipe is uniform in texture, dimensions, and strength. Also furnish a certificate from the manufacturer certifying that the pipe furnished for this project meets the requirements of these specifications.

E. All Schedule 80 pipe shall be furnished in the manufacturer's standard laying lengths of 20 feet. The Contractor's methods of storing and handling the pipe shall be approved by the Owner. All pipe shall be supported within 5 feet of each end; in between the end supports, there shall be additional supports at least every 15 feet. The pipe shall be stored away from heat or direct sunlight. The practice of stringing pipes out along the proposed sewer line routes will not be allowed without Owner approval.

F. Each piece of pipe shall be labelled with the following:
1. Nominal Size
2. Type of Material
3. Class
4. Manufacturer

G. Pipe that fails to comply with the requirements set forth in these specifications shall be rejected.

2.4 JOINT RESTRAINT SYSTEMS

A. Provide pressure pipeline shall be fully restrained with joints at each bend, tee, and change in direction and as indicated in the Construction Drawings and Standard Details.

B. All exposed bolts and hardware shall be Type 316 stainless steel.

2.5 WARNING TAPE, TRACER WIRE, AND UTILITY MARKER:

A. For product information on detectable warning tape, tracer wire, and utility markers reference Section 31 23 16 – Excavation.

2.6 VALVE BOXES

A. The CONTRACTOR shall furnish and install valve boxes where indicated on the Contract Drawings and specified herein.

B. All valve boxes shall be placed so as not to transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve. The ground in the trench upon which the valve boxes rest shall be thoroughly compacted to prevent settlement. The boxes shall be fitted together securely and set so that the cover is flush with the finished grade of the adjacent surface. A 24-inch square concrete pad shall be provided around each valve box, sloped outwards. A 3-inch diameter bronze disk engraved with the valve size, type and service shall be embedded into each concrete pad described above.

C. All valve boxes shall be 2-piece cast iron, sliding type, 5¼-inch shaft, with heavy duty traffic weight collar and the lid marked with the appropriate carrier product (i.e., WATER). Boxes shall be as manufactured by James B. Clow & Sons, Kennedy Valve Manufacturing Company, or Charlotte Pipe and Foundry Company. Valve boxes shall be of domestic manufacture.

D. Extension shafts shall be rigidly attached to all buried valve operating nuts such that the operating nut is located six inches below grade.

2.7 AIR RELEASE VALVE ASSEMBLIES

A. Air release assemblies shall be furnished and constructed according to the detail in the Standard Drawings. Install meter box or manhole cone as indicated.

B. Air valves shall be located at all high points on the pipeline in accordance with the drawings, or as directed by the Owner.

C. Combination Air Valve:
1. The combination air valve shall conform to AWWA C512 and perform the functions of an air release valve and an air & vacuum valve, in a single body type, suitable for use with municipal wastewater.
2. Minimum valve size is 2-inch. Valves 3-inch and smaller shall have an NPT inlet and outlet. Sizes 4-inch and larger shall have flanged inlet and a protective cowl on the outlet. Additional plugged NPT ports shall be provided near the top and bottom of the body for testing and draining.
3. Materials:
   a. The valve body and cover shall be made from cast iron conforming to ASTM A126 Class B.
   b. The float balls shall be spherical and made from Type 316 stainless steel. Internal linkage mechanism, plug, seat, and orifice shall be Type 316 stainless steel. Non- metallic linkage mechanism and/or float balls are not acceptable.
   c. The air release seats shall be adjustable, replaceable and made from Buna-N rubber. The air & vacuum seat shall be replaceable and made from Buna-N rubber.
   d. The exterior of the valve shall be shop coated with enamel primer.
   e. Exterior bolts and hardware shall be Type 304 or 316 stainless steel.
4. Valve shall be rated for 200-psi with working pressures up to 150-psi.
5. Manufacturer: A.R.I., Model D-020 Combination Air Valve for Wastewater.

D. Brass ball valve shall quarter-turn, lever handle type with zero leakage at a working pressure of 200psi. Shall comply with NSF 61.

2.8 CHECK VALVES:

A. Design and Materials: Hayward WCV Series Wafer Check Valve or approved equal
1. The valve body and cover shall be constructed of ASTM D1784 PVC.
2. Shall be a solvent welded true-union connection
3. Shall be rated for 150 PSI at 70°F

4. 316 SS spring
5. EPDM gasket seals
6. Suitable for vertical and horizontal installation
7. Integral bolt eyes
8. Restrained with 316 SS exterior bolts

B. Valve Schedule
1. CV-01, CV-02, CV-03: 4-inch PVC check valves
2. CV-04: 6-inch PVC check valve

2.9 GATE VALVES

A. Design and Materials:
1. The valve body shall be ductile iron ASTM A536 65-45-12 with wedge seating surface and body seat rings cast from ASTM B148 C95800 bronze and coated internally and externally with fusion bonded epoxy.
2. Constructed in accordance with AWWA C500 standards.
3. Stem shall be non-rising with a 2-inch nut.
4. Stems shall have integral collars and be machined from corrosion resistant grade 316 stainless steel.
5. Body and bonnet fasteners shall be type 316 stainless steel.
6. Connection type shall be mechanical joint.
7. Shall be rated for 300-psi.
8. Valve box shall be installed according to section 3.2 below.

2.10 Plug Valves
1. Plug valves shall be by DeZURIK, Inc. or equal.
2. Plug Valves shall be rectangular port, resilient seated and body and bonnet shall be of the same material.
3. Port area shall be 100% of nominal pipe area at all points of the valve.
4. General:
   a. All plug valves shall be of rectangular port, eccentric type unless otherwise specified.
   b. Port area shall be 100% of pipe area.
   c. Exposed valves shall have flanged ends. Buried valves shall have Mechanical Joint ends.
5. Design Working Pressures:
   a. Valves 12 inch and Smaller: 175 psig.
6. Maximum Fluid Temperature: 180 deg F.
7. Valves shall provide drip tight bidirectional shut off at the design working pressure, operating pressures and test pressures.
8. The plug shall have a cylindrical seating surface eccentrically offset from the center of the shaft. Plug shall not contact the seat until at least 90% closed:
9. The interface between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure.
10. Round Ports are not acceptable.

11. Spherical Plugs are not acceptable.
12. All Actuators will be mounted, adjusted and tested at the valve manufacturers facility. This shall be evidenced by witness test of the entire assembly, at the engineer's discretion, at the manufacturer's facility.
13. Materials of Construction:
    a. Body (including bonnet): Cast or Ductile Iron ASTM A 536, Grade 65-45-12. Material substitutions are not acceptable.
    b. Plug:
    c. Core: Cast or Ductile Iron ASTM A 536, Gr. 65-45-12.
    d. Plug Facing: Chloroprene (CR).
    e. For valves up to 8 in. plugs shall be fully encapsulated with rubber. Valves over 8 in. shall have plug seating surface fully encapsulated with rubber.
    f. Plug resilient facing shall have a rubber to metal bond strength (pull) of 250 psi (ASTM D 429 Method A) and a minimum bond strength (peel) of 75 psi (ASTM D 429 Method B).
    g. To ensure the quality of the Chloroprene, the rubber compound shall be manufactured, applied to the plug, and vulcanized per the manufacturer's standards at the manufacturer's plant.
    h. Certifications will be provided to and reviewed by the engineer as a part of the submittal package.
    i. Any deviations will require witness test at the manufacturer's facility of rubber manufacturing process.
    j. Stem Bearings: Sintered, oil impregnated permanently lubricated of type 316 stainless steel ASTM A743 Grade CF8M through 36" (900mm). In valves larger than 36" (900mm), the upper and lower plug journals shall be fitted with ASTM A240 type 316 stainless sleeves with body bearings of ASTM B30, Alloy C95400 aluminum bronze.
    k. Seal/Packing: Acrylonitrile-Butadiene (NBR) multiple V-ring type, with a packing gland follower.
        1) Packing shall be able to be replaced without disassembly of the valve
        2) Packing shall be adjustable by the use of adjustable nuts on the packing gland
        3) Self adjusting packing not acceptable
        4) Packing adjustment using removable shims not acceptable.
        5) Video of packing replacement procedure verifying no valve or actuator disassembly is required shall be provided with submittal package to qualify as an or equal.
14. Seat: 1/8" thick welded overlay of not less than 95% pure nickel.
15. Seat shall be at least 1/2" wide, 1/8" thick through entire width and raised.
16. The raised surface shall be completely covered with nickel to insure that the resilient plug face contacts only the nickel seat.
17. Packing gland: Cast Iron ASTM A 126 Class B.
18. Actuators:
19. For buried applications actuators shall be fully sealed, buried/submerged rated worm gear type. Gear shall terminate in a 2" nut.
20. Extension stems, floor box and valve box shall be by contractor as specified in contract documents.

21. Non buried applications actuators on the 14-inch Plug Valves scheduled for replacement shall match existing.
22. Smaller valves shall be provided with a manual worm gear sized for 80lb rimpull maximum.
23. Exposed actuators shall be as noted on the drawings:
24. Actuators shall clearly indicate valve position.
25. Provide adjustable stop for setting closing torque and seat adjustment.
26. All exposed nuts, bolts, and washers shall be type 316 stainless steel.
27. Provide handwheel or operating wrench for operation of actuator as shown. Handwheels shall be a minimum of 12-inches in diameter. Provide chain operators for overhead valves.
28. Actuators shall be suitable for effecting shutoff of valve.

PART 3 – EXECUTION

3.1 INSTALLATION OF PRESSURE SEWER PIPE

A. Excavation, Bedding, Backfill, Clean-Up, and Maintenance:
   1. As specified in Section 31 23 16 – Excavation.
   2. Hand trim for accurate placement of pipe to elevations as indicated on Drawings.

B. Installation of pipe:
   1. Lay pressure sewer pipe to the lines and grades required by the Drawings.
   2. Unless otherwise noted on the Drawings, all pressure sewer pipes shall have a minimum of 60 inches of cover. Pressure sewer pipe with less than 60” of cover shall be heat traced and insulated with a minimum of 2” insulation thickness as shown and specified on the drawings.
   3. Take every precaution to keep foreign material from getting into the pipe while it is being staged or placed in the line. Remove all debris, mud, leaves, etc., that may have accumulated within the pipe. Before any pipe is laid, brush and wipe clean the outside of its spigot end and inside the bell, and leave dry and oil-free.
   4. Place no debris, tools, clothing, or other materials in the pipe during laying operations.
   5. Pipe shall be placed in the center of the trench, equidistant from the walls of the trench.
   6. After a length of pipe has been placed in the trench, center the spigot end in the bell of the adjacent pipe, and then insert to the depth specified by the manufacturer and bring to the correct line and grade. Pipe shall be “homed” per manufacturer’s instructions.
   7. Whenever pipe laying is not in progress, close the open ends of the pipe with a watertight plug. This shall be done not only at the end of each working day but also before work is stopped for lunch periods, bad weather, or any other reason. If there is water in the trench, leave the seal in place until the trench has been completely dewatered.
   8. Cut pipe so that valves, fittings, or closure pieces can be inserted in a neat and workmanlike manner and without any damage to the pipe. Follow the manufacturer’s recommendations concerting how to cut and machine the ends of

the pipe in order to leave a smooth end at right angles to the pipe's axis.

9. Lay pipe with the bell ends facing in the direction laying unless otherwise directed by the Owner.
10. Wherever pipe must be deflected from a straight line (vertically or horizontally), the amount of deflection and/or the radius of curvature shall not exceed that recommended by the manufacturer.
11. Thrust restraint shall be installed wherever the force main changes in direction, casing pipes, stream crossings, or at any other point recommended by the manufacturer or as indicated in the Construction Drawings.
    a. Joint restraint shall be installed:
        1) For all pipe joints within a stream crossing,
        2) For all joints within a casing pipe,
        3) The last joint of pipe prior to a tie-in location,
        4) As otherwise noted on the Construction Drawings or Standard Details.
12. Lay no pipe in water or when it is the Inspector's opinion that trench conditions are unsuitable.
13. Where a sewer line crosses a drinking water or storm sewer line, the sewer line shall be installed below the line being crossed and shall provide a minimum of 18 inches of vertical separation between the lines.
14. Where a pressure sewer line is to be installed parallel to a drinking water or storm sewer line, provide a minimum of 10 feet of horizontal separation between the lines.
15. Install tracer wire and detectable warning tape the full length of all pressure sewer lines.
16. The Contractor shall take necessary precautions to ensure that the tracer wire and marking tape are not pulled, distorted, or otherwise misplaced in completing the trench backfill.
17. Backfill trench according to the Standard Drawings and Section 31 23 16 – Excavation.

3.2 INSTALLATION OF VALVES

A. Install valves as shown on the Construction Drawings and in accordance with the valve manufacturer's recommendations.

B. Valves 12-inch and larger shall be provided with special supports such as crushed stone or concrete pads so that the pipe will not be required to support the weight of the valve. Valves shall be installed in the closed position.

C. Valve boxes shall be carefully set, centered exactly over the operating nut and truly plumbed. The valve box shall not transmit shock or stress to the valve. The bottom flange of the lower belled portion of the box shall be placed below the valve operating nut. This flange shall be set on brick, so arranged that the weight of the valve box and superimposed loads will bear on the base and not on the valve or pipe. Extension stems shall be installed where depth of bury place the operating nut in excess of 60 inches beneath the grade so as to set the top of the operating nut 30 inches below finished grade. The valve box cover shall be flush with the surface of the finished area or such

other level as indicated in the Construction Drawings.

D. In no case shall valves be used to bring misaligned pipe into alignment during installation. Pipe shall be supported in such a manner as to prevent stress on the valve.

E. A valve marker shall be provided for each underground valve. Unless otherwise detailed on the Construction Drawings or directed by the Engineer, valve markers shall be installed 6 inches inside the right-of-way or easement.

F. Air release valves shall be installed at all high points or as directed by the Owner and as shown on the Standard Drawings.

3.3 INSTALLATION OF THRUST RESTRAINT FOR UTILITY PIPING

A. Thrust restrain system shall be joint restraint (preferred) and/or Thrust Blocking, as specified on the Drawings.

B. Joint restraint shall be in accordance with AWWA C600.
1. Install joint restraint system such that joints are mechanically locked together to prevent joint separation.
2. Restrained type joints shall be assembled in accordance with the manufacturer's recommendations.
3. The Contractor shall inspect each pipe joint within 500 feet on either side of main line valves to ensure 100 percent seating of the pipe spigot, except as noted otherwise.
4. Each restrained joint shall be inspected by the Contractor to ensure that it has been "homed" 100 percent.

C. Thrust blocking shall be Class A concrete and as shown in the Standard Drawings.

3.4 PAINTING

A. Shop painting and the surface preparation is a part of the work specified in this section and shall be as specified on the Plans.

3.5 START-UP SERVICES

A. Provide start-up services.

3.6 MANUFACTURER'S TRAINING

A. Manufacturer's training shall be provided for training of OWNER'S personnel for the equipment.

3.7 TESTING

A. Testing and inspection of installed sewer force main piping shall be in accordance with

Section 33 31 22 – Testing of Sanitary Sewer Mains and Manholes.

3.8 Warranty

A. Two Year Warranty shall be provided for all valves.

END OF SECTION 33 31 23

SECTION 33 34 56

DOSING CHAMBERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Siphon system for sand filter dosing chamber

B. Related Requirements:
   1. Section 33 01 30 – Operation and Maintenance of Sewer Utilities.
   2. Section 33 31 22 – Testing of Sanitary Sewer Mains and Manholes.
   3. Section 33 31 23 – Sanitary Sewer Force Main Piping.

1.3 SUBMITTALS

A. Action Submittals:
   1. Sewer flow control plan. See Section 33 01 30 – Operation and Maintenance of Sewer Utilities.

1.4 QUALITY ASSURANCE

A. Materials will be visually inspected by Owner or Inspector at the Site for conformance to the Specifications. At Owner's discretion, Contractor may be required to supply certified mill tests, samples, or other suitable form of verification that the material meets the required specifications. Any material that fails to conform to these Specifications shall be rejected and removed from the project by the Contractor at no cost to the Owner.

B. Installation of materials shall be performed by qualified personnel.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on Site in manufacturer's original packaging and inspect for damage.

B. Store materials according to manufacturer's instructions.

C. Protection:
   1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
   2. Provide additional protection, such as UV protection, according to manufacturer instructions.

PART 2 – PRODUCTS

2.1 SIPHON BELL

A. 20-inch diameter high density polyethylene (HDPE) by Fluid dynamics or approved equal submitted in accordance with 01 33 00.

2.2 TRAP

A. 6.2-inch O.D3/16-inch HDPE

2.3 VENT PIPE

A. All PVC Pressure Pipe shall be manufactured from Type I, Grade I unplasticized polyvinyl chloride (PVC) with a cell Classification of 12454-B, and shall conform to the requirements of ASTM D1784 and D1785 standards. The pipe shall be Schedule 80 PVC and shall be manufactured in strict compliance to ASTM D1785, consistently meeting and/or exceeding the Quality Assurance test requirements of this standard with regard to pressure rating, material, workmanship, burst pressure, flattening, impact resistance, and extrusion quality. The pipe shall be manufactured in the USA, using domestic materials, by ISO 9001 certified manufacturer.

B. All fittings for Schedule 80 pipe shall be one-piece injection molded or fabricated from PVC (Polyvinyl Chloride) meeting ASTM D1784. Joints shall solvent welded as recommended by the manufacturer.

C. All Schedule 80 pipe shall be furnished in the manufacturer's standard laying lengths of 20 feet. The Contractor's methods of storing and handling the pipe shall be approved by the Owner. All pipe shall be supported within 5 feet of each end; in between the end supports, there shall be additional supports at least every 15 feet. The pipe shall be stored away from heat or direct sunlight.

2.4 JOINT RESTRAINT SYSTEMS

A. All exposed bolts and hardware shall be Type 316 stainless steel.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Excavation, Bedding, Backfill, Clean-Up, and Maintenance:
   1. As specified in Section 31 23 16 – Excavation.
   2. Hand trim for accurate placement of pipe to elevations as indicated on Drawings.

B. Installation of pipe:
   1. Install siphon and trap to grades required by the Drawings. Siphons must be installed plumb and at matching elevations to ensure proper operation

2. Take every precaution to keep foreign material from getting into the pipe while it is being staged or placed in the line. Remove all debris, mud, leaves, etc., that may have accumulated within the pipe. Before any pipe is laid, brush and wipe clean the outside of its spigot end and inside the bell, and leave dry and oil-free.
3. Place no debris, tools, clothing, or other materials in the pipe during laying operations.

3.2 TESTING

A. Testing and inspection of installed sewer force main piping shall be in accordance with Section 33 31 22 – Testing of Sanitary Sewer Mains and Manholes.

END OF SECTION 33 34 56

ITEM 627.0043 25 PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment, and services necessary to complete the work of furnishing, installing, testing, and placing into service trickling filter media and associated support systems as indicated on the Contract Plans and in the Specification Sections listed below.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as the Owner may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0043 25 PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

6. SPECIFICATION SUMMARY

6.01 This Item includes the following Specifications:

A. Section 43 11 33 – Rotary Positive Displacement Blower
B. Section 43 20 00 – Wastewater Pumps

6.02 This item shall include, but not be limited to, the following:

A. Furnish and install Influent Lift Pumps, Trickling Filter Feed Pumps, Sludge Pumps, Equalization Tank Pumps, Rotary Lobe Blowers and Control Panels in accordance with the Contract Documents.

B. Coordinate installation with piping specified in Section 33 31 23

C. Provide anchorage, fasteners, and accessories required for a complete and operable system.

D. Protect delivered equipment from damage after delivery and during construction and replace damaged units at no additional cost.

E. Perform field inspections and testing to verify proper installation and function

F. Provide factory-authorized startup assistance and demonstration of proper installation and maintenance procedures.

G. Deliver operation and maintenance manuals.

SECTION 43 11 33

ROTARY POSITIVE DISPLACEMENT BLOWER

PART 1 GENERAL

1.1 REFERENCES

A. The following is a list of standards which may be referenced in this section:
1. Acoustical Society of America (ASA): 47, Specification for Sound Level Meters.
2. American Bearing Manufacturers Association (ABMA).
3. American Gear Manufacturers Association (AGMA).
4. American National Standards Institute (ANSI).
5. ASTM International (ASTM):
   a. A48/A48M, Standard Specification for Gray Iron Castings.
   b. A395/A395M, Standard Specification for Ferritic Ductile Iron Pressure Retaining Castings for Use at Elevated Temperatures.
6. American Society of Mechanical Engineers (ASME): PTC-10, Power Test Codes.
7. American Welding Society (AWS):
   a. B2.1, Standard for Welding Procedure and Performance Qualification.
   b. D1.1, Structural Welding Code – Steel.
   c. QC 1, Standard for AWS Certification of Welding Inspectors.
8. Canadian Standards Association (CSA).
9. Electrical and Electronics Manufacturers Association of Canada (EEMAC).
10. National Building Code of Canada (NBCC).
11. National Electrical Manufacturers Association (NEMA).

1.2 DEFINITIONS

A. Absolute Discharge Pressure: Pressure in pounds per square inch absolute (psi absolute) at the blower discharge flange in relation to Job Site barometric pressure.

B. Brake kW: Standard curve kW required corrected for pressure, temperature, and relative humidity at inlet conditions.

C. Discharge Pressure: Pressure in pounds per square inch gauge (psi) at the blower discharge flange at rated capacity.

D. Inlet Cubic feet per minute (cfm): Volumetric rate of air at the inlet flange of the blower corrected to absolute pressure, temperature, and relative humidity. The pressure takes into account the inlet piping and filter pressure drops.

E. Pressure Rise: Pressure developed within the blower between the inlet and outlet flanges. It is the discharge pressure less the inlet pressure measured at the discharge and inlet flanges, respectively.

F. Standard Cubic Feet per Minute (scfm): Volumetric rate of air measured in standard cubic feet per minute at 68 degrees F, pressure of 14.7 psi absolute, and relative humidity of 36 percent.

1.3 SYSTEM DESCRIPTION

A. Blower system featuring two rotary positive displacement blowers to supply air for the equalization tank.

B. Provide blower system including, but not limited to, blower, motor, drive, guards, drive coupling, baseplate, vibration isolators, supports, inlet silencer, discharge silencer, bypass silencer, relief valve, flexible connectors, noise enclosure, spare parts, inlet air filter, and miscellaneous appurtenances as necessary for a complete operating system.

1.4 DESIGN REQUIREMENTS

A. Design equipment with due regard to safety of operation, accessibility, and durability of parts, and complying with applicable OHSA, provincial, and local safety regulations.

B. The blower will receive unfiltered ambient air and discharge into a separate discharge line.

C. Intermittent and continuous operation in an outdoor environment.

D. Blower shall start no more than four times per hour when operating in intermittent service.

E. Blowers shall meet rated performance and sound level when operating at a maximum gear speed of 132 scfm. Operating speed shall not exceed 80 percent of rated speed.

F. Maximum Sound Pressure Level: 69 dBA, factory calculated, with inlet and discharge silencers, measured with a sound enclosure.

G. Performance Requirements:

Design Conditions	
Design Capacity, scfm	124 scfm
Altitude, ft	1791 ft
Inlet pressure at compressor flange, psi absolute	13.7 psia
Design Conditions	
Inlet air temperature, degrees C (Guarantee Point)	100 F
Relative humidity, % (Guarantee Point)	50%
Discharge pressure at compressor discharge flange, psi absolute	19.2 psia

1.5 SUBMITTALS

A. Shop Drawings:
   1. Complete list of system components to be provided.
   2. Make, model, weight, and horsepower of each equipment assembly.
   3. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
   4. Standard and specialized equipment assembly cuts.
   5. System layout, installation, and placing drawings for equipment, drivers, and bases.
   6. Performance data for each type of equipment that will show compliance with specification requirements stated herein.
   7. Power demand over the operating range of the blower.
   8. Detailed structural, mechanical, and electrical drawings showing the equipment fabrications and interface with other items. Include dimensions, size, and locations of connections to other work.
   9. Motor: 208V, 3 phase
   10. Instruments data.
   11. Sound Enclosure:
      a. Complete description of sound enclosure and accessories.
      b. Calculated noise attenuation.

B. Other Submittals:
   1. Factory calculated sound levels (dBA) of blower unit with silencers and sound enclosure.
   2. Identification of outside utility requirements for each component such as air, water, power, etc. Include operating parameters for required utilities.
   3. Routine maintenance requirements prior to plant startup.
   4. Test Reports:
      a. Factory test reports for blower and motor.
      b. Field test procedures.

1.6 EXTRA MATERIALS

A. Furnish, tag, and box for shipment and storage the following spare parts, special tools, and materials:

Item	Quantity
Oil, synthetic	One year supply
Inlet filters	Enough for five complete changes
Flexible coupling	One
Gaskets and seals	One complete set
Drive V-belts	One complete set
Special tools required to maintain or dismantle	One complete set for each unit

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. General:
1. Manufacture parts to North American standard sizes and gauges.

B. Materials, equipment, and accessories specified in this section shall be products of:
1. Kaeser Compressors
2. Or approved equal in accordance with 01 33 00

2.2 COMPONENTS

A. Blower:
1. Rotary positive displacement type, direct or belt driven by horizontal electric motor.
2. Casing:
a. One-piece construction, ASTM A48/A48M Class 30B close-grain cast iron, strongly ribbed to prevent distortion at the specified operating conditions. Separate headplates of cast iron.
b. ASME B16.1 Class 125 flanged inlet and outlet connections.
3. Bearings:
a. Each shaft and impeller assembly shall be supported by cylinder roller bearings
b. Drive end bearings shall be fixed to control axial location of impeller assembly.
c. Bearings and gears shall be lubricated by a splash type lubrication system on both ends of the rotors.
d. Provide each bearing with a positive lip type oil seal designed to prevent
lubricant from entering air stream and a labyrinth seal on each shaft designed to reduce air leakage at point where shaft extends through headplate of blower casing.
e. Make further provision to vent area between the two sealing systems to atmosphere to relieve excessive pressure on seals.
4. Impellers:
A. Three-lobe

7. Belt Drive:
a. V-belt drive with automatic belt tension device.
b. Minimum service factor of 1.4.
c. Designed not to exceed allowable overhung load limits of blower and motor.
d. Provide belt guard.

B. Motor:

1. Squirrel-cage ac induction type, meeting requirements of Section 26 20 00, LowVoltage AC Induction Motors, and as specified herein.
2. Motor Size: Determined by Contractor.
3. Nominal Speed: Maximum 1,750 rpm, constant.
4. Rated Voltage: 575 volt, three-phase, 60-Hz.
5. Enclosure Type: TEFC as specified in Section 26 20 00, Low-Voltage AC Induction Motors.
6. Drive: Direct-drive coupling or V-belt drive.
7. Motor Efficiency: Premium efficiency as specified in Section 26 20 00, LowVoltage AC Induction Motors.
8. Service Factor: 1.15.

C. Blower Support:
1. Baseplate: Cast iron or fabricated steel mounted on concrete equipment pad as shown on Drawings.
2. Support Stand: Designed by manufacturer and shall be reinforced to withstand anticipated loadings of blower, motor, inlet and discharge silencers and associated piping.
3. Factory mount blower and motor as a package.
4. Provide vibration isolators to limit transmission of vibration to anchor points at floor.

2.3 ACCESSORIES

A. Combination Inlet Filter/Silencer:
1. Suitable for indoor installation and mounted directly to the inlet flange of the blower. Silencer shall be located upstream of the inlet filter.
2. Filter media efficiency of 90 percent by weight per ASHRE 52-76 with synthetic dust equivalent to separation > 95% @ 5 microns. Filter element shall be washable by maintenance personnel as a preventative maintenance procedure.
3. Rated capacity of filter shall be the maximum rated capacity of the blower. Filter and silencer performance losses shall be included in the blower performance calculation.
4. Housing shall be designed to withstand a full vacuum or 103 kPag.
5. Inlet filter clean pressure drop will be not more than 50 mm of water. End connections shall be ANSI: B16.5, Pipe Flanges of the size required. Intake filters shall be provided with 13 mm tapped connections on the inlet and discharge sides of the filter for differential pressure instrument connections.
6. Provide differential pressure gauge to measure the pressure drop across the intake filter.
7. Provide pressure differential indicating switch as manufactured by Dwyer, Ashcroft or United Electric. Switch shall be equipped with DPDT contacts that change state on high differential pressure, based on manufacturer's recommendations.
8. Manufacturers and Products:
    a. Universal.
    b. Stoddard.

B. Discharge and by-pass Silencers:

1. Designed to reduce pulsation from rotary lobe blowers at blower operating timing gear speed.
2. For timing gear speeds below transition speeds, use a multi-chambered reactive type silencer, and for timing gear speeds at or above transition speed, use a multichambered reactive and absorptive type silencer packed with hair-felt packing.
3. Inlet/Outlet Air Velocity: 1,680 m/min, maximum.
4. Pressure Loss: 150 mm WC maximum, through silencer at design flow rate.
5. Inlet and outlet flanges shall match the piping size shown on Drawings and blower flanges. Flange drilling shall be 125-pound ANSI standard.
6. Provide drain coupling and plug.
7. Manufacturers and Products:
    a. Universal.
    b. Stoddard.

C. Flexible Connectors:

1. Pressure spool, single arch, expansion joint type with ASME Class 150 flanges, sized to match blower flanges.
2. Operating Temperature Rating: Determined by Contractor.
3. Install at inlet and outlet flanges.
4. Thrust restraint rods on discharge if not otherwise restrained.
5. Manufacturers and Products:
    a. Mercer; Style 500.
    b. General Rubber; Style 1025.
    c. Vibraflex; PCS Series.

D. Check Valve:

1. Wafer type, installed in blower discharge piping downstream of silencer and relief valve.
2. Cast iron body, stainless steel pin and spring, and two semicircular cast iron or aluminum plates.
3. Seat: Viton or Silicone for high temperature operation. Elastomeric hinges will not be allowed.
4. Manufacturer: Techno Corporation or equal.

E. Safety Relief Valve:

1. Spring type or cast iron weighted non-vibrating type, with flanged connection.
2. Sized to relieve entire discharge flow without overloading blower.
3. Provide nozzle on discharge silencer to mount relief valve.

F. Discharge Pressure Gauge:

1. Provide pressure gauge to indicate the blower discharge pressure.
2. Include pulsation snubber.

G. Discharge Temperature Sensor:

1. Allow for the installation of a HIGH discharge air temperature sensor located directly after blower discharge.
2. Provide details of the required sensor for supply by others as per 40 90 00.

H. Discharge Pressure Sensor:
1. All for the installation of a HIGH discharge air pressure sensor located directly after blower discharge.
2. Provide details of the required sensor for supply by others per 40 90 00.

I. Noise Enclosure:
1. Provide noise enclosure covering the entire blower package including the drive motor.
2. Designed and fabricated for easy inspection and maintenance of all blower package components. Provide quick release panels weighing not more than 20 kg each. Panels weighing more than 20 kg shall be hinged with the appropriate frame reinforcements and supporting elements.
3. Sound enclosure acoustic material as a minimum shall comply with UL 94 - HF1 for fire-retardant self-extinguishing, non-dripping materials. Materials with a lesser rating are not acceptable. If used, non-flammable packing materials such as compressed mineral fibers are only acceptable if lined with appropriate retaining mat and supported by galvanized perforated sheet.
4. Mount enclosure and blower package on a skid / oil-drip pan designed for meeting environment protection standards and for easy transportation and installation.
5. Provide grounding strap between blower base and package skid to bypass any vibration isolating mounts.
6. Provide separate electric motor driven fan for heat removal from noise enclosure.
7. Total Noise Enclosure: 85 dBA average noise level at 1 meter.

8.

J. Weather Enclosure:
1. Product shall be suitable for outdoor installation including a stainless steel roof cover and powder coated enclosures.

2.4 INSTRUMENTATION AND CONTROLS

A. Manufacturer provided controls that complete the following: Motor starter, alarm dial out feature, switches for hand/auto, lead/standby

B. Provide a comprehensive control narrative and functional requirements specification

C. Provide items not specifically called out which are required to implement functions required for proper system operation.

2.5 FACTORY FINISHING

A. Furnish manufacturer's standard enamel finish, color as selected.

2.6 SOURCE QUALITY CONTROL

A. Blower Performance Test:

1. Perform on the blower actually furnished in accordance with manufacturer's established criteria.
2. Test each blower for a minimum of 1 hour after stabilization at conditions near the performance ratings for mechanical integrity and flow performance. a. Perform at or above specified performance pressure rise.
   b. Tolerance on Flow: Plus or minus 4 percent, after correction to rated conditions.
3. Measure power consumption using a calibrated wattmeter.
4. Test Report: Confirm capacity and power, complete with data and calculations used in the test.

PART 3 EXECUTION

3.1 INSTALLATION

A. By Installation Contractor in accordance with manufacturer's written instructions.

B. Anchor Bolts: Furnish templates from manufacturer and as specified in Section 05 50 00, Metal Fabrications (Basic).

3.2 FIELD QUALITY CONTROL

A. Functional Test: Prior to facility startup, conduct on each blower system, assisted by Installation Contractor, for correct rotation, proper alignment and connection, quiet operation, and satisfactory specified performance.

3.3 MANUFACTURER'S SERVICES

NOT USED

END OF SECTION 43 11 33

SECTION 43 20 00

WASTEWATER PUMPS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Furnish and install submersible centrifugal process pumps for wastewater, sludge handling, and trickling filter feed service.
   2. Equipment includes pumps, motors, guide rail systems, discharge elbows, power cables, and accessories.

1.2 REFERENCES

A. Hydraulic Institute Standards

B. NEMA MG-1

C. ASTM A48, ASTM A532

D. CSA and FM Electrical Certifications

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles.

B. Shop Drawings:
   1. Include plans, elevations, sections, and mounting details.
   2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.
   4. Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For pumps and controls, to include in operation and maintenance manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Retain shipping flange protective covers and protective coatings during storage.

B. Protect bearings and couplings against damage.

C. Comply with manufacturer's written instructions for handling.

1.6 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. UL Compliance: Comply with UL 778 for motor-operated water pumps.

2.2 SLUDGE PUMPS (DOUBLE DISC POSITIVE DISPACEMENT TYPE)

A. General
1. Pump shall be a **horizontal, dry-installed, positive displacement sludge pump** utilizing free-disc or equivalent non-contacting pumping elements.
2. Pump shall be specifically designed for **raw sludge transfer containing rags, fibrous material, and debris** without clogging or emulsification.
3. Pump shall be capable of operation with **flooded suction** and intermittent or continuous duty.
4. Pump shall be base-mounted with rigid structural steel base and OSHA-approved belt and coupling guards.
5. Pump shall be suitable for maintain-in-place servicing without removal from piping.

B. Performance
1. Rated capacity shall be
   a. 30 gpm at 25 feet TDH, or
   b. 57 gpm at 25 feet TDH.
2. Rated capacity shall be indicated on Drawings
3. Pump speed shall not exceed 200 RPM for 3-inch size and 175 RPM for 4-inch size.
4. Pump shall be capable of variable-speed operation for flow control.
5. Pump shall be non-overloading throughout the operating range.

C. Hydraulics
1. Pumping elements shall consist of two free-floating elastomeric discs or approved equal operating in a rigid housing.
2. Pump shall include:
3. a. Full-port rigid clack valve or equivalent check mechanism.
4. b. Two-piece swan neck suction design.
5. Pump shall be self-priming when flooded and capable of handling entrained air without loss of prime.
6. Suction and discharge connections shall be ASA/ANSI Class 150 flanges.

D. Materials of Construction
   1. Pump housing: Cast iron.
   2. Pumping discs: Neoprene or approved elastomer suitable for sludge service.
   3. Trunnions and internal hardware: Corrosion-resistant steel.
   4. Base: 304 stainless steel welded base.
   5. Coating: Industrial primer and topcoat on pump and dampeners.

E. Shaft Sealing and Bearings
   1. Pump shall not require mechanical shaft seals in contact with sludge.
   2. Shaft bearings shall be grease lubricated and sized for minimum L10 life of 50,000 hours.
   3. Pump shall incorporate isolation between drive components and pumped media.

F. Motor and Drive
   1. Motor shall be severe-duty, inverter-rated, suitable for VFD operation.
   2. Motor rating:
   3. a. 2 HP for 3-inch pump, or
   4. b. 3 HP for 4-inch pump.
   5. Motor speed: 1160 RPM nominal.
   6. Power supply: 230/460V, 3-phase, 60 Hz.
   7. Drive shall be V-belt and pulley type with adjustable sheaves.

G. Electrical and Controls
   1. Pump shall be suitable for operation with motor starter
   2. Operated by motor starter, soft-start feature shall be provided.
   3. Pump shall be provided with:
      a. Suction vacuum sensor and gauge assembly.
      b. Discharge pressure switch and gauge assembly for overpressure protection.

H. Accessories
   1. Suction and discharge pulsation dampeners.
   2. 304 stainless steel base with OSHA-approved guards and covers.
   3. Set of recommended spare parts including:
      a. Two (2) discs
      b. Two (2) trunnions
      c. One (1) clack valve
      d. One (1) set of gaskets
   4. Pressure sensor and gauge assemblies for suction and discharge lines.
   5. Identification tag and nameplate.

I. Manufacturers:
   1. Basis of Design:
      a. Penn Valley Pump Company – Double Disc Pump (Models 3DDSX11CNU-MK1 or 4DDSX30CNU-MK3)
      b. Or approved equal in accordance with 01 33 00

2.3 SUPPORT STAND FOR PUMPS

A. Each pump shall be supplied with a cast iron stand with an integrated 90° suction elbow. The suction flange shall be **4”** suction flange drilled according ANSI B16.1-89; tab.5. The stand shall be fastened with anchor 4 bolts on a flat concrete floor.

B. The inlet elbow shall have an inspection hatch of at least 5”

2.4 TRICKLING FILTER FEED PUMPS AND INFLUENT PUMP STATION PUMP

A. General
1. Pump shall be an intelligent submersible centrifugal non-clog pump with integrated variable-speed drive and adaptive control logic.
2. Pump shall automatically adjust speed and impeller direction to maintain optimal hydraulic performance and minimize clogging.
3. Pump shall be suitable for continuous duty in trickling filter influent and recirculation service.
4. Installation shall be semi-permanent wet-well mounted on a guide rail system with automatic discharge connection.

B. Performance
1. Rated capacity: 75 gpm at 20 feet TDH.
2. Best Efficiency Point (BEP): approximately 167 gpm at 12.6 feet head.
3. NPSHR at design point: not greater than 2.96 feet.
4. Maximum flow capability: not less than 300 gpm.
5. Maximum pumped media temperature: 104°F.
6. Pump shall maintain efficiency over a wide flow range by variable-speed control.

C. Hydraulics
1. Impeller shall be Adaptive N® self-cleaning two-vane design.
2. Discharge size: 3-inch flanged outlet.
3. Hydraulic passages shall be capable of passing fibrous material without clogging.
4. Volute design shall minimize head loss and turbulence.

D. Materials of Construction
1. Impeller: Hard-Iron abrasion-resistant cast iron.
2. Volute: Gray cast iron.
3. Stator cover: Gray cast iron.
4. Shaft: Stainless steel.
5. Fasteners: Stainless steel.

E. Shaft Sealing and Bearings
1. Shaft sealing system shall consist of Flygt Plug-in Seal with Active Seal System.
2. Seal faces shall be silicon carbide or tungsten carbide.
3. Bearings shall be heavy-duty permanently lubricated type with minimum L10 life of 50,000 hours.
4. Seal leakage and bearing temperature shall be continuously monitored by internal

sensors.

F. Motor and Drive
1. Motor shall be permanent-magnet variable-speed submersible motor.
2. Rated power: 3 HP.
3. Voltage: 208V, 3-phase, 60 Hz.
4. Speed range: 800 to 2,091 RPM.
5. Insulation class: Class H.
6. Duty: Continuous (S1).
7. Motor efficiency: IE4 equivalent or greater.

G. Integrated Controls and Intelligence
1. Pump shall include onboard controller capable of:
a. Automatic impeller rotation correction.
b. Anti-clog and sump cleaning cycles.
c. Pipe cleaning cycles.
d. Flow optimization and energy minimization.
2. Pump shall provide digital diagnostics for temperature, leakage, and vibration.

H. Electrical and Instrumentation
1. Power and signal cable shall be factory-sealed and submersible rated.
2. Pump shall include:
a. Thermal sensors
b. Leakage sensors
c. Cable damage detection
3. Motor shall be suitable for direct connection to intelligent controller without external VFD.

I. Accessories
1. Guide rail system with discharge base elbow.
2. Stainless steel lifting chain.
3. Automatic coupling system.
4. Integrated pump controller.
5. Identification tag and lifting bail

J. Manufacturers:
1. Basis of Design:
a. FLYGT NT 3085 MT 463
b. Or approved equal in accordance with 01 33 00

2.5 EQUALIZATION TANK PUMPS

A. General
1. Pump shall be an intelligent submersible centrifugal non-clog pump with integrated variable-speed drive and adaptive control logic.
2. Pump shall automatically adjust speed and impeller direction to maintain optimal hydraulic performance and minimize clogging.

3. Installation shall be semi-permanent wet-well mounted on a guide rail system with automatic discharge connection.

B. Performance
1. Rated capacity: 63 gpm at 15 feet TDH.

C. Hydraulics
1. Impeller shall be Adaptive N® self-cleaning two-vane design.
2. Discharge size: 3-inch flanged outlet.
3. Hydraulic passages shall be capable of passing fibrous material without clogging.
4. Volute design shall minimize head loss and turbulence.

D. Materials of Construction
1. Impeller: Hard-Iron abrasion-resistant cast iron.
2. Volute: Gray cast iron.
3. Stator cover: Gray cast iron.
4. Shaft: Stainless steel.
5. Fasteners: Stainless steel.

E. Shaft Sealing and Bearings
1. Shaft sealing system shall consist of Flygt Plug-in Seal with Active Seal System.
2. Seal faces shall be silicon carbide or tungsten carbide.
3. Bearings shall be heavy-duty permanently lubricated type with minimum L10 life of 50,000 hours.
4. Seal leakage and bearing temperature shall be continuously monitored by internal sensors.

F. Motor and Drive
1. Motor shall be permanent-magnet variable-speed submersible motor.
2. Rated power: 2 HP.
3. Voltage: 208V, 1-phase, 60 Hz.
4. Insulation class: Class H.

G. Integrated Controls and Intelligence
1. Pump shall include onboard controller capable of:
    a. Automatic impeller rotation correction.
    b. Anti-clog and sump cleaning cycles.
    c. Pipe cleaning cycles.
    d. Flow optimization and energy minimization.
2. Pump shall provide digital diagnostics for temperature, leakage, and vibration.

H. Electrical and Instrumentation
1. Power and signal cable shall be factory-sealed and submersible rated.
2. Pump shall include:
    a. Thermal sensors
    b. Leakage sensors
    c. Cable damage detection

3. Motor shall be suitable for direct connection to intelligent controller without external VFD.

I. Accessories
1. Guide rail system with discharge base elbow.
2. Stainless steel lifting chain.
3. Automatic coupling system.
4. Integrated pump controller.
5. Identification tag and lifting bail

J. Manufacturers:
1. Basis of Design:
a. FLYGT N 3069 MT 1
b. Or approved equal in accordance with 01 33 00

2.6 CONTROLS PANELS

A. Influent Pump Station

1. Pumps shall be operated on a new control panel
2. Shall be operated on hand/off/auto switches with user configurable level setpoints for automatic activation and deactivation and high level alarm. Pumps shall operate in a lead/lag format.

B. Trickling Filter Lift Pumps and Sludge Pumps

1. Shall be operated on a new Duplex control panel
2. Sludge pumps shall operate on hand/off switches
3. Trickling Filter Lift pumps shall operate on hand/off/auto switches with user configurable level setpoints for automatic activation and deactivation and high level alarm. Pumps shall operate in a lead/lag format.

C. Equalization Tank Pumps

1. Pumps shall be operated on a new control panel
2. Shall be operated on hand/off/auto switches with user configurable level setpoints for automatic activation and deactivation and high level alarm. Pumps shall operate in a lead/lag format.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine wet well, guide rail supports, and discharge piping stub-outs to verify correct alignment, elevations, and dimensions prior to pump installation.

B. Verify that concrete surfaces are smooth, level, and free of debris prior to installing guide rails and discharge base elbows.

C. Verify electrical rough-in, conduit, and control wiring locations prior to pump installation.

3.2 INSTALLATION

A. Pump Installation Standards
1. Install submersible centrifugal wastewater pumps in accordance with Hydraulic Institute HI 1.4.
2. Install pumps in accordance with manufacturer's written installation and operation instructions.
3. Install pumps in semi-permanent wet well configuration using guide rail and automatic discharge connection.

B. Equipment Mounting
1. Install discharge base elbows anchored to concrete floor using stainless steel anchor bolts.
2. Install guide rails plumb and aligned with discharge base elbow.
3. Lower pumps onto guide rails and ensure proper seating onto discharge base elbow.
4. Provide adequate clearances for pump removal and maintenance.
5. Provide corrosion-resistant hardware for submerged service.

C. Vibration and Structural
1. Ensure pump and piping installation prevents transmission of vibration to concrete structures.

D. Electrical Installation
1. Install power and control cables suitable for submersible service.
2. Provide watertight cable entry seals and strain relief.
3. Route cables to control panels without sharp bends and without exceeding manufacturer's minimum bend radius.
4. Provide support for cables to prevent abrasion and fatigue.

3.3 CONNECTIONS

A. Provide flanged connections between discharge elbow and force main piping.

B. Install isolation valves and check valves as shown on Drawings.

C. Allow sufficient clearance for pump removal without dismantling piping.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service
1. Engage a factory-authorized service representative to inspect installation, supervise startup, and verify performance.

B. Tests and Inspections
1. Perform visual and mechanical inspection of pump seating, guide rails, and discharge

connections.
2. Leak Test: Fill wet well and pressurize discharge piping; repair leaks and retest until no leakage is observed.
3. Operational Test:
   a. Energize electrical circuits.
   b. Start pumps and verify correct rotation and proper discharge.
   c. Confirm automatic seating and coupling.
4. Controls and Safeties:
   a. Test thermal sensors, leakage sensors, and alarm circuits.
   b. Verify automatic control functions and level control operation.
5. Concertor Pumps: Verify intelligent control functions including anti-clog cycle, sump cleaning cycle, and adaptive speed control.

C. Acceptance
1. Pumps and controls will be considered defective if they do not pass tests and inspections.

D. Documentation
1. Prepare written test and inspection reports and submit to Engineer.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.
1. Verify pump installation, electrical connections, and control logic.
2. Confirm design operating point by observing flow and head conditions.
3. Program intelligent pump parameters for trickling filter pump operation.
4. Document startup results.

3.6 ADJUSTING

A. Adjust pumps to operate smoothly without vibration or cavitation.

B. Adjust control set points for wet well level control and trickling filter feed rate.

C. Optimize pump speed and control logic for energy efficiency.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner’s personnel.

B. Instruction shall include:
1. Pump removal and reinstallation procedures.
2. Normal operation and emergency operation.
3. Interpretation of alarms and diagnostics.
4. Routine maintenance and inspection procedures.

END OF SECTION 43 20 00

ITEM 627.0046 25 WATER AND WASTEWATER EQUIPMENT

1. DESCRIPTION:

1.01 Furnish all labor, materials, equipment, and services necessary to complete the work of furnishing, installing, testing, and placing into open channel grinder motor replacement and associated support systems as indicated on the Contract Plans and in the Specification Sections listed below.

1.02 All work shall conform to the requirements specified in Part 1 – General, of the Sections listed.

2. MATERIALS:

2.01 The materials shall be as specified in Part 2 – Products, of the Sections listed within the Specification Summary of this bid item.

3. CONSTRUCTION DETAILS:

3.01 The construction details shall be as specified on Part 3 – Execution, of the Sections listed.

4. METHOD OF MEASUREMENT:

4.01 This item shall be measured for payment on a lump sum basis for the work completed in accordance with the Contract Documents and as directed by the Engineer.

5. BASIS OF PAYMENT:

5.01 Payment for this item shall be made at the lump sum bid price bid. The lump sum price bid shall include cost of furnishing all labor, material, equipment and appliances necessary to complete the work as indicated on the Contract Plans and as specified herein in the Sections listed.

5.02 Detailed Estimate:

A. Before the first certificate of payment is issued for the work under this item, submit a detailed estimate of quantities and prices for all materials, labor, and other items included under this item, which shall aggregate the contract lump sum price bid for this item. Prepare the detailed estimate in the same sequence as the Sections listed.

B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as the Owner may require.

C. The detailed estimate must be approved by the Engineer who may revise it as, in his/her reasonable judgment, is necessary to make the various items conform to their true values. The value of each certificate of payment will be based on the approved detailed estimate.

5.03 Monthly payments will be made for this item in proportion to the total amount of work completed.

ITEM 627.0046 25 **WATER AND WASTEWATER EQUIPMENT**

6. SPECIFICATION SUMMARY

6.01 This Item includes the following Specifications:

A. Section 46 43 11 – Chain-and-Flight Clarifier Equipment
B. Section 46 51 21 – Coarse Bubble Diffusers
C. Section 46 53 24 – Trickling Filter Media and Distribution System

6.02 This item shall include, but not be limited to, the following:

A. Furnish and install the following in accordance with the Contact Documents:
    a. Clarifier chain-and-flight equipment
        i. Coordinate installation with existing field conditions
    b. Coarse bubble diffusers and associated air piping
    c. Structured plastic trickling filter media including complete media support system including stanchions, slope corrector plates, and FRP grating.
    d. Hydro-powered trickling filter rotary distributor arm and nozzles

B. Provide anchorage, fasteners, and accessories required for a complete and operable system.

C. Protect delivered equipment from damage after delivery and during construction and replace damaged units at no additional cost.

D. Perform field inspections and testing to verify proper installation and function

E. Provide factory-authorized startup assistance and demonstration of proper installation and maintenance procedures.

F. Deliver operation and maintenance manuals.

SECTION 46 43 11

CHAIN-AND-FLIGHT CLARIFIER EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Chain-and-flight clarifier collectors.
   2. Scum-removal equipment.
   3. Effluent troughs and weir assembly.
   4. Weirs and baffles.

B. Related Requirements:
   1. Section 33 01 30 – Operation and Maintenance of Sewer Utilities

1.2 DEFINITIONS

A. FRP: Fiberglass-reinforced plastic.

B. UHMW PE: Ultra-high-molecular-weight polyethylene.

1.3 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:
   1. ASME B17.1 - Keys and Keyseats.
   2. ASME B29.100 - Double-Pitch Roller Chains, Attachments, and Sprockets.

B. ASTM International:
   1. ASTM D4020 – Standard Specification for Ultra-High-Molecular-Weight Polyethylene Molding and Extrusion Materials.

C. National Electrical Manufacturers Association:
   1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.4 PREINSTALLATION MEETINGS

A. Convene minimum one week prior to commencing Work of this Section.

1.5 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product Data: Submit manufacturer's product data for system materials and component equipment, including electrical characteristics.

E. Shop Drawings:
1. Indicate system materials and component equipment.
2. Submit wiring and control diagrams, installation and anchoring requirements, fasteners, and other details.

F. Manufacturer's Certificate:
1. Certify that products meet or exceed specified requirements.
2. Certify installation is completed according to manufacturer's instructions.

G. Manufacturer's Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

H. Source Quality-Control Submittals: Indicate results of **shop** tests and inspections.

I. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

J. Manufacturer Reports: Attest that equipment has been installed according to manufacturer's instructions.

K. Qualifications Statement:
1. Submit qualifications for manufacturer.

1.6 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of installed chain-and-flight clarifier equipment.

B. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts:
1. Furnish one set of manufacturer's recommended spare parts.

B. Tools: Furnish special wrenches and other devices required for Director’s Representative to maintain and calibrate equipment.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum ten years' documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's packaging including installation instructions.

B. Inspection: Accept clarifier equipment on Site in original packaging and inspect for damage.

C. Store materials according to manufacturer's instructions.

1.10 EXISTING CONDITIONS

A. Field Measurements:
1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

1.11 WARRANTY

A. Furnish **1**-year manufacturer's warranty for chain-and-flight clarifier equipment and accessories.

PART 2 - PRODUCTS

2.1 CHAIN-AND-FLIGHT EQUIPMENT

A. Manufacturers:
1. Install Aqua Equip Technologies (AET) Chain & Flight Scraper System or approved equal in accordance with 01 33 00.

B. Effluent Trough:
1. Material: FRP
2. Connections: Bolted, with **neoprene** gaskets.

C. Effluent Weir Plates:
1. Material: FRP
2. Minimum Vertical Adjustment: 3 inches

D. Scum-Removal Equipment:
1. Description: Slotted pipe spanning the width of clarifier.
2. Material: Nonmetallic
3. Operation: [Manual]
4. Scum Baffle:
   a. Description: Baffle attached to effluent trough to keep floating scum from reaching effluent weirs.
   b. Material: FRP.
   c. Minimum Thickness: 1/4 inch
   d. Width: 9 inches, adjustable to 3 inches above maximum water level.
   e. Attach to effluent trough with FRP brackets and stainless-steel bolts.
5. Scum Trough:
   a. Material: Welded steel.
   b. Minimum Thickness: 1/4 inch
   c. Provide flanged connection for scum discharge pipe.
   d. Type: Adjustable dipping weir.
   e. Collector Pipe:
      1) Material: Steel construction.
      2) Comply with ASTM A53,Schedule 20 minimum.

f. Operator:
   1) Type: Manual operating lever, mounted on collector pipe.
   2) Material: Steel pipe.
   3) Minimum Diameter: 1-1/4 inches

E. Flights:
1. Scraper flights shall be DEWA C-180 profile, pultruded from GRP with a nominal section of 180 mm height x 80 mm width, specifically designed for sludge collector service and proven in collectors of similar width and length.
2. The longitudinal scraper flights member shall have a product of the moment of inertia about its minor axis (Iyy) and its modulus of elasticity (E) - (E x I) of 3.37×108 lb-in².
3. The scraper flights are manufactured from high-grade pultruded GRP (isophthalic polyester resin) with ≥55% continuous fiberglass content.
4. The maximum water absorption shall not exceed 0.50% after 24-hour immersion at 73 °F (per ASTM D570), ensuring dimensional stability in submerged conditions.
5. The chain to flight attachment brackets shall attach to the back side (closed side) of the GRP flights and pull the flights. Pushing of the flights by attaching a chain link to the front side (open side) of the FRP flights shall not be allowed.
6. Polypropylene filler blocks shall not be used to attach the chain to the flights.
7. Scraper flights shall be spaced at 10 to 12-foot spacing for Longitudinal Collector(s).
8. All attachment hardware shall be 316 Stainless Steel.
9. Flights shall include rubber blades on selected scrapers for floor and wall cleaning.
   a. Material: Polyethylene (PE).
   b. Size: 3 inches by 3/8 inch thick.
   c. Attach with Type 316 stainless-steel washers welded to top of return track angle, maximum 30 inches o.c.

F. Collector Chain:
1. The collector chain shall be non-metallic, DEWA LK-160, manufactured from POM.
2. The chain shall be designed for a minimum working load of 3,150 to 3,350lbf and an average tensile strength of 5,400 to 6,500lbf.
3. The chain shall be manufactured of high-strength, rigid POM resin designed for dimensional stability, wear resistance, and UV exposure. Chains which are made of reinforced thermoplastic polyester shall not be acceptable.
4. The chain shall be assembled with pins of a minimum 0.860-inch diameter, manufactured of reinforced PBT material. Reinforced nylon Pins shall not be acceptable.
5. The pins shall have a self-locking T-head design and retained with rings. Retainer clips which can loosen over time shall not be allowed.
6. Chain shall be shipped in pre-assembled strands to meet flight spacing requirements, for ease of assembly in field.
7. To compensate for chain elongation over time the manufacturer must provide an automatic chain tensioning system. (see more in section H). The chain tensioning system shall automatically offset chain elongation. Chain tightening which requires draining of the basin such as removing chain links and replacing them with half links shall not be allowed.
8. Rolling bushings for chain pins: Each chain pin shall have a free rolling bushing to reduce sprocket wear.

G. CHAIN TO FLIGHT ATTACHMENT BRACKET

1. Flight attachments shall be manufactured from POM with stainless steel (SS 316) fasteners.
2. The flight to chain attachment bracket shall be bolted onto a regular chain link.
3. The flight to chain attachment bracket shall be removable from the chain link by removing the stainless steel bolts to ensure easy replacement of brackets without cutting or opening the chain loop.
4. Chain to flight attachment links which require opening or cutting of the chain loop shall not be allowed. Attachment brackets shall be shipped mounted onto the chain links to ensure easy assembly in the field.

H. WEAR SHOES

1. Each scraper flight shall be provided with two (2) ¾-inch thick wear shoes to run on floor rails and two (2) ¾-inch thick wear shoes to run on return rails.
2. Shoes shall be molded from UHMW-PE for use on stainless steel rail system (see section rail system). Other materials shall not be allowed to reduce abrasion between stainless steel rail system and wear shoes.
3. Shoes shall have at least an average raw material tensile strength of 3,000 psi.
4. Carrying wear shoes shall run on floor rails.
5. Wear shoes shall be reversible providing two (2) usable wearing surfaces.
6. The leading edge of all wear shoes shall be fully radiused and rounded for smooth transition between wear strips.

I. COLLECTOR CHAIN SPROCKETS

1. Collector and idler sprockets shall be molded from PE or equivalent Nylon 6 with tensile strength ≥10,000 psi.
2. To reduce sprocket wear the tooth crests shall be elongated with a minimum length of 3-inch and there shall be an exact number of 12 teeth in total. Sprockets shall be compatible with DEWA LK-160, manufactured from POM. Sprockets with “hunting tooth” profile, an odd number of teeth shall not be allowed.
3. Sprockets shall be reversible to double lifespan.
4. To improve lifespan all Sprockets shall be solid, finished bore type. Split type sprockets shall not be allowed.
5. Sprockets shall have a diameter of 24 ¼”.
6. Head shaft collector sprockets shall have a keyway machined in the bore and utilize a SS316 retainer ring to restrict lateral movement.

J. HEAD SHAFT

1. For maximum robustness the head shaft shall be made of one solid stainless steel 316 round tube. Head shafts made from fiber reinforced epoxy or similar materials shall not be allowed for the head shafts.
2. The head shaft shall use UHMW-PE gliding bearings which are flanged to SS304 bearing housings.
3. Sprockets shall be keyed or clamped to the shaft and secured with AISI 316 fasteners.

4. Head shaft tubes shall be manufactured from stainless steel 316 and have a diameter between 4 and 8” depending on basin width.
5. Shaft shall be designed to transmit required torque without exceeding allowable shear or deflection limits. PE certified structural load calculations, including bending moment, shear stress, and allowable deflection, shall be performed based on chain tension forces and flight load distribution and submitted to the engineer for review.

K. IDLER AND TENSIONING SHAFTS

1. Idler and tensioning shafts shall be made of stainless steel 316.
2. Idler sprockets shall be identical to the head shaft sprockets especially regarding material, teeth design and number, sprocket diameter.

L. AUTOMATIC CHAIN TENSIONING SYSTEM

1. Manufacturer must provide an automatic chain tensioning system which will offset chain elongation automatically and without draining the basin or removing chain links.
2. The chain tensioning system shall be a spring loaded mechanism mounted to the top of the basin wall for easy operator access.
3. Replacing chain links by half chain links or removing entire chain links shall not be allowed as an alternative to the automatic chain tensioning system.
4. The tensioning shaft shall have slotted ends to fit onto a guiderail system allowing the tensioning shaft to move horizontally to offset chain elongation.
5. Material for the chain tensioning system shall be stainless steel 304.

M. SET COLLARS

1. Shafting set collars shall be Cast Nylon-6 with 316 Stainless Steel clamping bands.
2. Collars shall be solid, finished bore type and contain shoulders to contain the clamping band.

N. IDLER SHAFT BEARINGS

1. Stub Shaft bearings shall be virgin UHMW-PE, sized and machined to provide low-friction gliding support for specified shafts.
2. Bearings shall be removable and replaceable.
3. Hardware for bearings shall be SS316.

O. CARRY AND RETURN RAILS

1. Carry and return rails shall be constructed from stainless steel 304.
2. Each system shall include two carry and return rails.
3. Support return rails at approximately 6-foot centers.
4. Rails made from fiber reinforced plastic (FRP) shall not be allowed.

P. TRACK SUPPORT WALL BRACKET ASSEMBLIES

1. Wall bracket assemblies shall be solid type construction, with mounting holes for attaching to wall bracket, return and bottom rail.
2. Wall bracket shall be made of stainless steel 304 and include SS316 hardware. Nylon or other plastic materials shall not be allowed as an alternative.

Q. GUIDING WEAR SHOES

1. To ensure lateral alignment of each flight the manufacturer shall provide guiding wear shows.
2. The guiding wear shoes shall be made from UHMW-PE and attached with stainless steel 316 screws and nuts.
3. The guiding wear shoes shall be designed to ensure proper tracking without additional deflectors.
4. Each flight shall have 4 wear shoes.

R. BOTTOM RAILS

1. Bottom rails shall be made from stainless steel 304. Wear strips made from virgin Ultra High Molecular Weight Polyethylene (UHMW-PE) or other plastics have a limited lifespan and shall therefore not be allowed.
2. Bottom rail segments shall interconnect and leave a 1/16” drop ledge from one segment to another to avoid any collision of the flights with the bottom rail segment connection section.
3. Bottom rails shall come in nominal 10 ft. sections and measure a nominal 2-inch wide x 1/4- inch thick.
4. Each section shall have countersunk slotted holes to allow for and control the direction of thermal expansion.
5. The length of the tank bay floor shall have two (2) assembled lines of bottom rails to support the flight as it pulls sludge.
6. Bottom rails shall be mounted directly to concrete floors

S. DRIVE CHAIN

1. Drive chains and all pins, rollers, bushings and side plates shall be made from stainless steel 304. Non-metallic drive chains shall not be allowed.
2. Drive chain shall be a steel roller chain type.
3. Minimum working load must be no less than 1,600lbf.
4. Minimum ultimate strength must be no less than 7,500lbf.
5. The chain shall be designed to operate with a matching stainless steel 304 drive and driven sprocket.
6. Chain tensioning shall be achieved with an adjustable stainless steel 304 drive unit base plate. Chain tensioners that use manual levers shall not be allowed.
7. Chain pitch shall be 1inch and the chain weight shall be a minimum of 1.5lbs/ft

T. DRIVE SPROCKET ASSEMBLY AND TORQUE OVERLOAD PROTECTION

1. Provide a stainless steel 304 drive sprocket to match the drive chain.
2. The drive sprocket shall be machined with a keyway and secured to the shaft with a solid key and dual stainless-steel setscrews.
3. A retaining ring shall be installed as needed to prevent axial displacement.
4. The drive sprocket shall be a solid one piece construction machined with a bore to slip-fit onto the drive shaft. Torque overload protection shall be provided by motor current based overload protection in the local control panel. The motor circuit breaker and thermal overload relay shall trip and stop the drive unit in the event of a motor overload condition. Mechanical shear pins are not required.

U. DRIVE UNIT

1. The scraper system shall be powered by a compact geared motor drive unit, consisting of a helical bevel gear reducer with integrally mounted electric motor, forming a single, factory-assembled and aligned unit.
2. The drive unit shall be manufactured by Nord Gear or approved equal, and shall comply with the following performance and construction requirements:

a. GEAR REDUCER

1) Type: Helical bevel design, right-angle output, vertical mount
2) Enclosure: IP55 minimum, corrosion-resistant coating (C3 or better), color RAL5010 (or specified)
3) Gear Housing: Cast iron, precision-machined
4) Bearings: Anti-friction, rated for minimum L10 life of 100,000 hours
5) Seals: Triple lip shaft seals for oil retention and environmental protection
6) Lubrication: Pre-filled with CLP-HC-150 synthetic oil (or CLP-HC-460-NSF-H1 for potable/water service)
7) Output Shaft: Hollow shaft, corrosion-resistant AISI 304 stainless steel, with keyway
8) Mounting: Mounted on a stainless steel AISI 304L base plate, bolted to an adjustable support stand for alignment and tensioning

b. ELECTRIC MOTOR

1) Power: 1/4 HP (0.18 kW) minimum (size to match torque requirements)
2) Duty: Continuous (S1), inverter duty rated
3) Voltage: 208V / 3-phase / 60 Hz
4) Efficiency: NEMA Premium Efficiency in accordance with NEMA MG 1 Table 12-12, and shall also comply with IEC 60034-30-1 IE3 classification
5) Insulation Class: Class F, temperature rise to Class B limits
6) Enclosure: TEFC (Totally Enclosed Fan Cooled), IP66 minimum
7) Sound Level: The motor shall comply with NEMA MG 1 Section 9.8.2 regarding sound limits and shall not exceed 59 dB(A) at 3 meters, tested per ISO 3744 / ANSI S12.51.

c. Materials:

1) Frame & terminal box: Cast aluminum

2) Output shaft: AISI 304 stainless steel

d. Features:

1) Rotatable terminal box
2) Condensation drain holes
3) Rain cover (canopy)
4) Coated internally with corrosion-protective acrylic

e. MOUNTING & ADJUSTMENT

1) Drive unit shall be mounted to a leveling stand fabricated from AISI 304L stainless steel, adjustable in height to ensure proper chain tension.
2) Final alignment and base grouting shall be performed after installation and load testing.
3) The entire assembly shall be positioned at least 18 inches above the top of tank deck to comply with NFPA 820 clearance requirements.

f. ENVIRONMENTAL PROTECTION:

1) External surfaces of the motor and reducer shall be coated with two layers of epoxy primer and finished with two layers of polyurethane coating, achieving a 6–8 mil dry film thickness.
2) The coating system shall withstand a minimum of 600 hours of salt spray exposure per ASTM B117 and shall be suitable for severe industrial environments equivalent to ISO 12944-2 C5-I classification.

V. DRIVEN SPROCKET

1. The driven sprocket shall be manufactured from AISI 304 stainless steel, designed for use with a 16B-1 stainless steel roller chain for power transmission between the drive motor and the scraper shaft.
2. The sprocket shall be of solid one-piece construction, with integral, machined teeth and a dished body design to provide clearance for scraper flights passing over the shaft.
3. The sprocket shall be machined with a keyway and installed on the drive shaft using a solid key and stainless steel set screws to ensure torque transmission and prevent rotational or axial movement.
4. The number of teeth shall be selected to match the design flight speed and torque requirements, typically matching the pitch of the 16B-1 drive chain.
5. The driven sprocket shall be compatible with DEWA’s stainless steel drive chain and allow for smooth and consistent power transfer under variable loading conditions.
6. All materials and hardware in contact with the driven sprocket assembly shall be AISI 304 or 316 stainless steel, suitable for continuous operation in wet, corrosive, or submerged wastewater treatment environments.
7. The sprocket shall be installed on the main head shaft and designed to operate in alignment with the drive sprocket and tensioning system, ensuring long service life and minimal maintenance.

W. DRIVE CHAIN TIGHTENER

1. The drive chain arrangement shall be provided with a chain tightener to take-up slack in the drive chain.
2. For drive chain tightening the manufacturer shall provide an adjustable motor base plate. Cast Nylon slide arms or other manual levers shall not be allowed.

X. CHAIN GUARD

1. The drive chain and sprockets located above the deck shall be covered with a removable chain guard.
2. The chain guard shall be 304 Stainless Steel.

Y. ANCHORS AND FASTENERS

1. All anchor bolts shall be Type 316 Stainless Steel furnished by the Manufacturer.
2. Chemical adhesives for fixing anchor bolts into walls shall be of approved manufacturer and installed in accordance with manufacturer's printed instructions.
3. All fasteners shall be Type 316 Stainless Steel unless otherwise specified.

Z. CONTROL SYSTEM AND LOCAL CONTROL PANEL

1. Manufacturer shall provide one (1) local control panel for the collector drive unit, including:

    a. Power distribution and overload protection
    b. Start/Stop control for drive motors
    c. Manual/Auto modes
    d. Alarm indicators for motor overload and drive fault
    e. Emergency stop push-button

2. The panel shall be NEMA 4X, stainless steel 304 and rated for water treatment service, and available with:
3. Remote SCADA/PLC integration
4. VFD or soft starter (if required)
5. Operator status display

AA. SPARE PARTS

1. Spare parts shall be packaged and labeled separately.
2. The following spare parts shall be furnished at a minimum.
3. Ten (10) feet of collector chain.
4. Two (2) longitudinal flights, each furnished with wear shoes, and hardware.

2.2 SOURCE QUALITY CONTROL

A. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
   1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that clarifier basin is installed and ready to receive chain-and-flight clarifier equipment.

3.2 INSTALLATION

A. Install chain-and-flight clarifier equipment according to manufacturer's instructions.

B. Weir Plates: Mount weir plates against double bead of sealant.

3.3 FIELD QUALITY CONTROL

A. Dry Startup: Run equipment without liquid in basins and inspect for:
   1. Alignment of sprockets, chain, flights, and wearing surfaces.
   2. Binding and excessive heat buildup in drive units.

B. Wet Startup: Run equipment with wastewater in basins and verify proper operation.

C. Equipment Acceptance:
   1. Adjust, repair, modify, or replace components failing to perform as specified, and rerun tests.
   2. Make final adjustments to equipment under direction of manufacturer's representative.

D. Furnish installation certificate from equipment manufacturer's representative attesting equipment has been properly installed and is ready for startup and testing.

3.4 DEMONSTRATION

A. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Director’s Representative.

END OF SECTION 46 43 11

SECTION 46 51 21

COARSE BUBBLE DIFFUSERS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Furnish and install coarse bubble diffusers for the EQ tank
   2. Equipment includes piping, air headers, and accessories.

1.2 REFERENCES

A. ASTM A182

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles.

B. Shop Drawings:
   1. Include plans, elevations, sections, and mounting details.
   2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data

1.5 DELIVERY, STORAGE, AND HANDLING

A. Retain shipping protective covers and protective coatings during storage.

B. Protect bearings and couplings against damage.

C. Comply with manufacturer's written instructions for handling.

1.6 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 DIFFUSER HEADS

A. Materials of Construction
   1. Diffuser Headers: Schedule 80 PVC
   2. (88) Diffusers with ¾" NPT Flexcaps

B. Manufacturers:
   1. Basis of Design:
      a. SideCar Aeration System – Flexcap Diffusers
      b. Or approved equal
         1) Substitution requests will be considered in accordance with provisions in appropriate sections and the following conditions.
         2) Manufacturers not listed who deem their product comparable will perform the following tasks at the sole expense of the manufacturer to be considered.
            a) Submit certified documentation showing compliance and exceptions with these specifications a minimum of ten days prior to bid opening.

2.2 AIR PIPING

A. Materials of Construction
   1. Pipe shall be Type 304/304L stainless steel, ASTM A312, Schedule 10S.
   2. Pipe ends shall be beveled for welding where applicable.
   3. Butt-weld fittings shall be 304/304L stainless steel, ASTM A403, Schedule 10S to match pipe.
   4. Use long-radius elbows unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation Standards
   1. Fabricate and install in accordance with ASME B31.3 (Process Piping) unless noted otherwise.
   2. Welding shall be by qualified welders using qualified WPS/PQR.
   3. Prevent carbon steel contamination of stainless (dedicated stainless tools/brushes; keep stainless off carbon steel work surfaces).
   4. After fabrication, clean per ASTM A380; passivate stainless surfaces where required by project specifications.

3.2 PIPING CONNECTIONS

A. Provide flanged connections

B. Flanges shall be ASME B16.5, Class 150, 304/304L stainless steel (ASTM A182 F304/F304L)

C. Provide matching Class 150 flanged valves, spool pieces, and appurtenances.

D. Install valves as shown on Drawings.

3.3 BLOWER CONNECTIONS

A. Provide flexible connectors (stainless braided hose or rubber expansion joint rated for air service and 30 psi) at blower nozzles as shown/required to isolate vibration.

B. Provide guides/anchors as necessary so expansion joints/flex connectors are not subjected to lateral misalignment or pipe weight.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service
   1. Engage a factory-authorized service representative to inspect installation, supervise startup, and verify performance.

B. Tests and Inspections
   1. Perform visual and mechanical inspection of blower
   2. Leakage Test: Perform a pneumatic leak test at 1.1 × design pressure (33 psi) with soap solution / approved leak detection method, in accordance with ASME B31.3 safety requirements.
   3. Operational Test: Perform a clean water test by filling the tank with clean water and running the diffusers to verify even aeration

C. Acceptance
   1. Diffusers will be considered defective if they do not pass tests and inspections.

D. Documentation
   1. Prepare written test and inspection reports and submit to Engineer.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.
   1. Verify diffuser installation
   2. Perform a clean water test to verify even aeration
   3. Document startup results.

END OF SECTION 46 51 21

SECTION 46 53 24

TRICKLING FILTER MEDIA AND DISTRIBUTION SYSTEM

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Structured plastic trickling filter media.
   2. Media support system and underdrain interface.
   3. Accessories required for a complete and operable trickling filter installation.

B. Related Sections:
   1. Section 03 30 00 – Cast-in-Place Concrete.
   2. Section 07 41 33 – Aluminum Metal Roof Panels.
   3. Section 43 20 00 – Wastewater Pumps.

1.02 REFERENCES

A. Recommended Standards for Wastewater Facilities (Ten States Standards).

B. ASTM D1785 – PVC Pipe.

C. ASTM A240 – Stainless Steel Plate, Sheet, and Strip.

D. ASTM D695 – Rigid Plastics Compression Properties.

1.03 SUBMITTALS

A. Product Data:
   1. Media geometry and configuration.
   2. Specific surface area.
   3. Void ratio.
   4. Maximum hydraulic and organic loading rates.
   5. Chemical and ultraviolet resistance data.

B. Shop Drawings:
   1. Media layout and elevation.
   2. Support system configuration and anchorage.
   3. Relationship to rotary distributor and influent piping.

C. Operation and Maintenance Manuals.

1.04 QUALITY ASSURANCE

A. Manufacturer shall have minimum 10 years' experience supplying trickling filter media systems for municipal wastewater treatment facilities.

B. Installer shall be approved or certified by the media manufacturer.

C. System shall comply with applicable provisions of the Recommended Standards for Wastewater Facilities (Ten States Standards) for trickling filters.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver media in factory-wrapped bundles or modules.

B. Store off the ground on blocking and protect from ultraviolet exposure and physical damage.

1.06 WARRANTY

A. Provide manufacturer's standard written warranty for trickling filter media and support system.

B. Warranty period shall be not less than one (1) year from date of Substantial Completion.

C. Warranty shall cover defects in materials and workmanship under normal wastewater treatment service conditions.

D. Warranty shall not relieve Contractor of responsibility for corrections required by the Contract Documents.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Aqua Equip Technologies (AET) – CF19 Trickling Filter Media.

B. Approved Equals:
   a. Or approved equal in accordance with 01 33 00

2.02 TRICKLING FILTER MEDIA

A. Media shall be structured cross-flow polypropylene (PP) plastic fill media designed specifically for trickling filter applications.

B. Media Type: AET CF19 or approved equal.

C. Effective Specific Surface Area: Not less than 46 square feet per cubic foot (approximately 150 square meters per cubic meter).

D. Minimum Void Ratio: 90 percent.

E. Media Depth: 6 feet unless otherwise indicated on Drawings.

F. Media shall be resistant to oxidation, ozone, wastewater constituents, and ultraviolet exposure.

G. Media modules shall be factory fabricated and capable of being field assembled without cutting.

2.03 PERFORMANCE REQUIREMENTS

A. Media shall be suitable for application rates and organic loading typical of municipal trickling filter systems in accordance with Ten States Standards.

B. Maximum Hydraulic Loading: Not less than 10 gpm per square foot of plan area.

C. Organic Loading Range: Suitable for BOD loadings up to 25 lb BOD per 1,000 cubic feet of media volume.

D. Media shall promote uniform wastewater distribution and minimize short-circuiting.

2.04 SUPPORT SYSTEM

A. Support system shall consist of:
   1. PVC stanchions.
   2. Slope corrector plates.
   3. FRP grating panels.

B. System shall be designed to:
   1. Support full dead load of media, biological growth, and hydraulic loading.
   2. Maintain uniform drainage slope to the underdrain system.
   3. Provide corrosion resistance in wastewater environment.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify basin dimensions, elevations, and underdrain cleanliness prior to installation.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install support system plumb, level, and in accordance with manufacturer’s written instructions.
B. Install FRP grating and slope plates prior to media placement.

C. Install media modules to achieve full coverage and specified depth.

D. Coordinate installation with influent piping and rotary distributor in accordance with manufacturer's specifications.

3.03 FIELD QUALITY CONTROL

A. Inspect installed media for proper alignment and support.

B. Operate rotary distributor with clean water to verify:
   1. Free rotation.
   2. Uniform distribution.
   3. Absence of ponding or short-circuiting.

3.04 STARTUP AND DEMONSTRATION

A. Provide factory-authorized startup assistance.

B. Train Owner's personnel in operation and maintenance of media and support system.

3.05 PROTECTION

A. Do not permit heavy equipment or foot traffic over installed media.

B. Replace damaged media at no additional cost to Owner.

END OF SECTION 46 53 24

ITEM 699.04----25 - MOBILIZATION

1. DESCRIPTION:

1.01 Under this work the Contractor shall provide the following:

A. Necessary bonds, insurance, and prefinancing and set-up of necessary general plant, including shops, storage areas, Engineer's and Contractor's offices and such sanitary and other facilities as are required by local or state law or regulation.

B. Critical path method (CPM) schedule of operations as described in §108-01 of the TA Addendum.

C. M/WBE participation program meeting the M/WBE goals of the contract as described in §109-06 *Contract Payments* and in accordance with §102-12 *D/M/WBE Utilization*.

2. MATERIALS:

2.01 Unless otherwise specified, such materials as required for mobilization and are not to be part of the completed contract shall be as determined by the Contractor, except that they shall conform to any pertinent local or state law, regulation or code.

3. CONSTRUCTION DETAILS:

3.01 The work required to provide the above facilities and service for mobilization shall be done in a safe and workmanlike manner and shall conform with any pertinent local or state law, regulation or code. Good housekeeping consistent with safety and other requirements of this contract shall be maintained.

4. METHOD OF MEASUREMENT:

4.01 Payment for mobilization will be made on a lump sum basis.

5. BASIS OF PAYMENT:

5.01 The amount bid for mobilization shall not exceed four percent (4%) of the total contract bid price excluding the bid price for mobilization. Should the bidder exceed the foregoing four percent (4%), the Authority will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

The amount bid shall include the furnishing and maintaining of services and facilities noted under Section 1.01 to the extent and at the time the Contractor deems them necessary for its operations, consistent with the requirements of this work and the contract.

The amount bid shall be payable to the Contractor with the first contract payment made for other contract work following acceptable completion of all requirements noted under Section 1.01.

Payment will be made under:

Item Number	Item	Pay Unit
699.04----25	**Mobilization**	**Lump Sum**

SPECIAL NOTES

CONFIDENTIAL INFORMATION

1. **Confidential Information:** "Confidential Information" means any information not generally known to the public, whether oral or written, that the Authority claims is confidential and discloses to Contractor for the purposes of performing work on the Project. Confidential Information may include, but is not limited to, operational and infrastructure information relating to: bid documents, plans, drawings, specifications, reports, product information and data, business and security processes and procedures; personnel and organizational data, and financial statements; information system IP addresses, passwords, security controls, architectures and designs; and such other data, information and images that the authority deems confidential. The Authority will identify written Confidential Information by marking it with the word "Confidential" and will identify oral Confidential Information as confidential at the time of disclosure to the Contractor.

2. **Exempt Materials:** Confidential Information does not include information which, at the time of the Authority disclosure to Contractor; (a) is already in the public domain or becomes publicly known through no act of Contractor; (b) is already known by Contractor free of any confidentiality obligations; (c) is information that the Authority has approved in writing for disclosure; or (d) is required to be disclosed by Contractor pursuant to law so long as Contractor provides the Authority with notice of such disclosure requirement and an opportunity to defend prior to any such disclosure.

3. **Permitted Use:** Contractor may use Confidential Information solely for the purposes of performing work on the Project. Contractor may share Confidential Information with its employees, consultants, sub-consultants, sub-contractors, suppliers, and agents that are necessary to perform work on the Project ("Authorized Personnel"), but must ensure that such Authorized Personnel execute a Confidentiality and Non-Disclosure Agreement as set forth in the Minimum requirements for the Handling and Treatment of confidential Information. The Authority's disclosure of Confidential Information to Contractor shall not convey to Contractor any right to or interest in such Confidential Information and the Authority shall retain all right and title to such Confidential Information at all times.

4. **Protections:** Contractor shall hold Confidential Information confidential to the maximum extent permitted by law. Contractor shall safeguard Confidential Information in accordance with the Minimum Requirements for the Handling and Treatment of Confidential Information.

5. **Return of Confidential Information:** Upon the written request of the Authority, Contractor shall return all written Confidential Information to the Authority.

EXTERNAL CONNECTIONS

If in order to perform work on the Project, Contractor must make an external connection to the Authority's data communications infrastructure and/or access Authority information systems, Contractor shall in all respects comply with all Authority policies and procedures regarding such connections and information systems access and undertake whatever actions are necessary in the discretion of the Authority to ensure such compliance. Contractor shall be responsible for all costs associated with ensuring that its own network security measures comply with all Authority policies and procedures regarding external connections.

MINIMUM REQUIREMENTS FOR THE HANDLING AND TREATMENT OF CONFIDENTIAL INFORMATION

Contractor shall meet the following minimum requirements relative to project information that is identified as **CONFIDENTIAL.**

Authorized Personnel:

Contractor shall require that all authorized individuals or entities (e.g., employees, consultants, sub-consultants, sub-contractors, suppliers and agents) ("Authorized Personnel") to which it discloses **CONFIDENTIAL** information sign a Confidentiality and Nondisclosure Agreement ("Agreement"). Such Agreement shall provide that Authorized Personnel: are personally responsible at all times for protecting **CONFIDENTIAL** information that is in their possession or control; must always use proper precautions to safeguard against the unauthorized access and disclosure of **CONFIDENTIAL** information; must notify Contractor of any known or suspected instances of loss or theft of, or unauthorized access to, **CONFIDENTIAL** information; and must return all **CONFIDENTIAL** information to Contractor upon completion of the project. Contractor shall be responsible for enforcing the provisions of such Agreement through personal observation and supervision of Authorized Personnel and utilization of appropriate processes.

Contractor shall maintain a list of all Authorized Personnel which have access to **CONFIDENTIAL** information and must provide the Authority with such list upon the Authority's request. Contractor shall update such list monthly and notify the Authority of any changes in such list.

Inventory Control:

Contractor shall create and maintain an inventory of all **CONFIDENTIAL** information that it provides to Authorized Personnel. Upon completion of the project, Contractor shall check all **CONFIDENTIAL** information returned from Authorized Personnel against the inventory. Contractor shall provide a copy of the checked inventory to the Authority.

Use and Storage:

Contractor shall implement reasonable processes during normal working hours to prohibit unauthorized individuals from gaining access to **CONFIDENTIAL** information that is within the Contractor's custody and control. At times other than normal working hours, Contractor shall store **CONFIDENTIAL** information in a secure area, such as a fire-proof safe, locked desk, cabinet or other secure storage facility, where access can be controlled. Contractor shall control the access that Authorized Personnel have to **CONFIDENTIAL** information stored in such secure areas through the use of manual or automated locks and keys. Contractor shall maintain a list of Authorized Personnel who have access to such secure areas and the specific **CONFIDENTIAL** information therein.

Reproduction:

Contractor may reproduce **CONFIDENTIAL** information only to the extent necessary to carry out contract performance. Contractor must stamp/mark all **CONFIDENTIAL** information that is reproduced with the word **CONFIDENTIAL** and protect it in the same manner as the original.

Transportation:

To the extent feasible and reasonable, Contractor shall hand deliver **CONFIDENTIAL** information with instructions that only the addressee is allowed to open or view it. Contractor may send **CONFIDENTIAL** information that cannot be hand delivered via the U.S. Postal Service or express mail services (e.g., FEDEX) provided: it is packaged and sealed in a way that does not disclose its contents or the fact that it is **CONFIDENTIAL** information, and a signature from the recipient is required.

Under no circumstances shall a transportation method be used that cannot guarantee that **CONFIDENTIAL** information is accessed only by the intended recipient.

Disposal:

Contractor shall dispose of all **CONFIDENTIAL** information, regardless of its form or format, using a destruction method that prevents its unauthorized retrieval (e.g., crosscut or micro shredding, degaussing).

Loss, Theft or Unauthorized Access:

Contractor shall provide timely notice to the Authority upon discovery of any incident involving the loss or theft of, or unauthorized access to, **CONFIDENTIAL** information.

SPECIAL NOTE:
CONTROL OF MATERIALS

The Contractor's attention is directed to the TA Addendum, Section 106 – CONTROL OF MATERIAL, available from the Authority's website at: http://www.thruway.ny.gov/business/addendum/index.html. The Contractor understands and agrees that some or all of the off-site inspection and approval of material such as precast concrete items, structural steel, bridge bearings, concrete structural elements and/or their components to be used on this project will be done by the New York State Department of Transportation (NYSDOT) as the Authority's agent.

The Contractor agrees to the following conditions:

1. Whenever the Contractor receives direction from the NYSDOT regarding the approval/rejection of material that direction constitutes direction by the Authority under the contract and, shall be final and accepted as such by the Contractor.

2. The Contractor will not allow off-site materials subject to inspection and approval of NYSDOT to be shipped to the project site without direct authorization from the NYSDOT.

3. At the Pre-Award Meeting or as soon as practicable, but in any case, before the Pre-Construction Conference, the Contractor will provide the following information to the Thruway Authority's Director, Office of Construction Management, for transmittal to NYSDOT to arrange off-site inspections:

   A. The name and address of each Manufacturer of all materials, and portions thereof, requiring off-site quality assurance to be incorporated into this highway project.

   B. The name and address of each Fabricator fabricating each steel item or any portion thereof to be incorporated into this highway project.

   C. The name and address of each Fabricator manufacturing structural pre-cast/pre-stressed items or any portion thereof to be incorporated into this highway project.

4. The Contractor agrees that it and its Subcontractors and Suppliers will acquire all materials to be incorporated into this Thruway project **only** through Manufacturing, Batching and Fabrication facilities approved by NYSDOT.

AVAILABILITY OF ELECTRONIC BID DATA

1. SUMMARY:

The New York State Thruway Authority (the Authority) uses the BidX service for electronic bidding. BidX is a web-based bidding service accessible to all users and requires no special software to purchase or install. Users can view contract documents free of charge and may opt to pay a subscription-based fee dependent upon their choice of BidX offered tiered tools and services, and only when they choose to submit an electronic bid. Electronic bidding is covered under a subscription-based service fee. The BidX service reduces the time it takes to prepare a bid and alerts bidders to deadlines, omissions, and errors which minimizes the chances of submitting an incomplete or inaccurate bid.

BidX allows bidders to submit, update, or withdraw bids electronically as many times as needed until the official bid deadline. Bids are then locked and encrypted, so only the Authority can see the last submitted version. **While bidders can submit a bid up to the last minute, it is highly recommended to submit prior to the 10:30 A.M. deadline on the letting day to avoid encountering any technical issues. Bidders bear sole responsibility for ensuring the timeliness, completeness, and accuracy of their bid submissions.**

For additional information please refer to FAQ: Using the browser-based experience.

2. PARTICIPATION AND RELATIONSHIP TO PAPER DOCUMENTS:

Electronic bidding allows for the streamlining of procurement by reduced processing times, eliminating errors and reducing administrative costs. Please note that the Authority's adoption of electronic bidding does not force any Contractor to bid electronically. Rather, participation is voluntary. If submitting a bid using the BidX web-based bidding service, no paper is required. The bidder shall submit and digitally sign the electronic bid.

Due to the AASHTOWare Project Bids software no longer being supported, electronic bid on a CD, DVD or USB device will NO longer be allowed. **Traditional paper bid submissions will continue to be accepted and as documented in the Contract (Project) Proposal.**

Prospective bidders are to submit either an electronic bid or a paper bid, but NOT both.
If a bidder submits both an electronic bid via BidX and a paper bid, the BidX bid will rule, and the paper bid will be regarded as informal.

3. THIRD-PARTY SOFTWARE:

The Authority endorses no particular product but expects all such vendors and individuals to voluntarily keep pace with changes in Authority requirements and specifications.

AVAILABILITY OF ELECTRONIC BID DATA

4. PROPOSAL NOTES AND CHANGES BY AMENDMENT:

Bid proposals submitted via BidX shall be prepared using the electronic file(s) prepared by the Authority for that individual contract, including all updates issued via amendment.
Contractors are solely responsible for recognizing and properly responding to all special notes and circumstances as printed in the Contract Proposal and all changes by amendment from the amendment documents and/or notices communicated to them by the Authority's Capital and Contracts Management Unit.

Amendments are posted online at:
www.thruway.ny.gov/business/contractors/documents/index.shtml. Whenever an amendment is issued, the changes are automatically applied in BidX (bidx.com). Contractors no longer need to download separate files and manually apply the amendment to their bid submission. Do not bid without carefully reviewing the printed proposal and any and all changes by amendment. Proposal notes and circumstances include, but are not limited to, printed information on alternate, fixed and/or limited cost items and/or special circumstances regarding item placement and use.

SPECIAL NOTE:

REQUIREMENTS FOR CONTRACTOR'S UTILIZATION OF AREAS OUTSIDE OF THE RIGHT-OF-WAY

1. Before the contractor can utilize any area outside of the NYS Thruway Authority (NYSTA) Right of Way (or outside of a temporary easement obtained for the project by the NYSTA), for any work associated with this project, written approval to do so shall be obtained from the NYS Thruway Authority through the Project Engineer. The contractor's request for approval shall be in writing and the Authority shall be allowed 2 weeks to review the request and respond.

2. This requirement applies to areas such as, but not limited to: borrow areas, spoil areas, equipment and/or material storage areas, haul roads, batching areas, water points, shop areas, and all similar areas. This requirement does not apply to the Contractor's established and permanent headquarters, commercial borrow sources, commercial gravel pits, commercial quarries, and all similar areas.

3. The contractor's written request for approval shall include a letter report prepared by an Environmental Professional, acceptable to the Authority, documenting the investigation of the proposed site. The expectation is that an Environmental Professional visits the site, performs an assessment of the proposed use against all applicable environmental requirements, and then documents their findings and recommendations. The letter report shall include the following unless otherwise authorized by the Authority:

   a) A written description of the activities the contractor wishes to perform at the proposed site, including timeframes.

   b) Maps showing Federal and State regulated wetlands. The area proposed for use shall be depicted on each map.

   c) A site location map which accurately shows the area proposed for use, adjacent property boundaries/owners, the location of all wetland boundaries observed, and any required erosion and sediment control measures. If present, wetlands shall be delineated in the field by the Environmental Professional with stakes and ribbon, and wetland delineation data forms shall be completed.

   d) A written statement prepared by the Environmental Professional regarding the presence of any rare animals or plants or significant natural communities. The Environmental Professional shall use the NYSDEC Environmental Resource Mapper to make this determination. If any rare species are identified, then determine if the rare species are listed as endangered or threatened and whether the NYSDEC determines the proposed use may be harmful to the species or their habitat. If so, address to the satisfaction of the NYSDEC.

   e) A copy of the applicable SPDES permit and any local municipal permits related to use of the site.

   f) A listing of other Environmental Permits which were obtained by the Authority for the project. These are referenced in the contract proposal.

   g) A completed NYSTA Property Release form. The form is available through the Project Engineer.

   h) A plan showing all restoration work. This includes, but is not limited to, plans for grading, surface restoration details, and erosion and sediment control.

4. This requirement does not waive other provisions of the contract related to use of lands outside the Right of Way. Rather, it shall be viewed as supplementary. The following contract provisions still remain in effect:

   §107-08 Protection and Restoration of Property and Landscape, Subsection B. Outside the Right of Way
   §107-10 Managing Surplus Material and Waste

COMPLIANCE WITH SPDES REGULATIONS

The Contractor is advised that the NYS Thruway Authority has evaluated Stormwater requirements for this project and has determined that coverage is not warranted under NYS Department of Environmental Conservation's SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-25-001). The Contractor shall read and understand the requirements of GP-0-25-001. In the event the Contractor's operations, e.g., clearing and grubbing, expanded staging area; will cause an increase in ground disturbance beyond the amount identified in the Contract Documents, coverage under GP-0-25-001 may be required. Prior to commencing these operations, the Contractor should immediately advise the Project Engineer, who will in turn discuss the request with the Project Designer and Division Environmental Specialist or Environmental Point of Contact.

- In the event coverage is required under GP-0-25-001 as a result of these operations, the Contractor will be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) and submit a Notice of Intent (NOI) with the NYS Department of Environmental Conservation.

- In the event coverage is required under GP-0-25-001 as a result of changes made by the Authority, the Authority will be required to prepare a SWPPP and submit a NOI.

In either case, the Contractor will not be allowed to proceed until verification of coverage under GP-0-25-001 has been provided to the Project Engineer. The Contractor shall make no claim against the Authority for delays resulting from preparing a SWPPP, filing a NOI, and seeking verification of permit coverage.

SPECIAL NOTE
EMBODIED CARBON REPORTING and ENVIRONMENTAL PRODUCT DECLARATIONS (EPDs)

Projects must comply with all applicable New York State (NYS) laws and policies to reduce the embodied carbon in building and infrastructure projects, including New York State Executive Order 22 (2022).

These laws and policies require Contractors to submit Environmental Product Declarations (EPDs) for certain building and construction materials supplied to State contracts. EPDs must be Product-specific Type III (Third Party Reviewed), in adherence with ISO 14025 *Environmental Labels and Declarations*, ISO 14044 *Environmental Management – Life Cycle Assessment*, and ISO 21930 *Core Rules for Environmental Product Declarations of Construction Products and Services*. Supply Chain-specific data should be used when available.

For permanently incorporated and temporary use construction materials manufactured and supplied for projects let after December 18, 2024, the Contractor shall ensure that all available EPDs are collected and submitted for asphalt mixtures, concrete mixtures (excluding precast), glass, and steel items when the quantity supplied to the project exceeds the values listed below. Units that are given in this document may differ from units listed in pay items and therefore, the Contractor must perform the necessary quantity conversion(s).

Construction Material	Minimum Quantity for Reporting (for Transportation Projects)
Concrete mixes	200 cubic yards or more (per mix design)
Asphalt mixes	8,000 short tons or more (per mix design)
Steel i. Rebar ii. Hollow Structural Sections iii. Fabricated Steel Plate iv. Hot-Rolled Sections v. Cold-Formed & Galvanized	20,000 pounds or more for rebar (category i.), per fabrication location 15,000 pounds or more for all others (categories ii – v), per fabrication location
Glass i. Flat Glass ii. Processed Glass iii. Insulated Glazing Units	2,000 square feet or more

The Contractor is not required to develop an EPD if one has not been developed by or for the manufacturer or supplier.

For projects that are active during the State Fiscal Year (April 1 - March 31) and are expected or known to meet the minimum quantities for reporting over the duration of the entire project, the Contractor shall complete and submit a “Contractor EPD Material Reporting Form” (Excel .xlsx format). The form is available on the Thruway Authority website at https://www.thruway.ny.gov/business/contractors/forms/index.html#contractor. The Contractor must submit the Contractor EPD Material Reporting form and all EPD(s) collected for the project to the Authority by emailing them to CarbonReports@thruway.ny.gov, with the Contract D number in the subject line of all e-mails. Questions about completing the form can be directed to the same e-mail address.

SPECIAL NOTE

DIESEL EMISSION REDUCTION ACT (DERA) REGULATORY COMPLIANCE

All New York State Thruway Authority (NYSTA) Contractors are made aware that Environmental Conservation Law (ECL) 19-0323 and the New York State Department of Environmental Conservation (NYSDEC) regulation 6 NYCRR Part 248 *Use of Ultra Low Sulfur Diesel (ULSD) Fuel and Best Available Retrofit Technology (BART) for Heavy Duty Vehicles* requires 100% compliance as of December 31, 2019 of all regulated heavy duty diesel vehicles working on all State awarded contracts. A link to NYSDEC's Part 248 Annual Reporting Requirements which states the current deadlines is located at: https://dec.ny.gov/regulatory/regulations/chapter-iii. NYSTA and its Contractors are responsible for annual reporting.

All NYSTA Contractors shall make determinations of regulatory applicability for vehicles in their inventory used on active NYSTA contracts during each reporting year. These determinations shall be based on the definition of Heavy Duty Vehicle (HDV) including on and off road diesel vehicles having gross vehicle weights in excess of 8,500 pounds, excluding vehicles that are exempt as defined in 6 NYCRR 248-1.1(b)(14). Contractors shall also quantify ULSD fuel used by regulated vehicles in active contract work during the reporting year.

An electronic copy of 6 NYCRR Part 248 can be accessed at http://www.dec.ny.gov/regs/2492.html. Electronic copies of the Regulated Entity Vehicle Inventory Form and the Regulated Entity and Contractors Annual Report Form can be accessed under Part 248 – Use of Ultra Low Sulfur Diesel Fuel and Best Available Retrofit Technology for Heavy Duty Vehicles at the following link:
https://www.dec.ny.gov/fs/docs/spreadsheets/248annrptfrm.xlsx.

To allow for required reports to be submitted to NYSDEC by the regulatory deadline of November 1, each year, NYSTA Contractors shall submit DERA annual reports to NYSTA by October 1, of every year reporting the required information from the previous reporting year (i.e., all 2019/2020 information to NYSTA by October 1, 2020, etc.). The following numbered information shall be submitted:

1. Inclusion of "DERA" and calendar year being reported in subject line of email
2. Contact information including firm name, contact person, phone number and e-mail
3. Estimated annual total quantity of ULSD fuel used by covered vehicles on NYSTA contracts
4. Required Fleet information for covered vehicles on NYSTA contracts

Electronic mail submissions can be sent to dieselreport@thruway.ny.gov

SPECIAL NOTES

GREEN CONSTRUCTION REQUIREMENTS

ULTRA LOW SULFUR DIESEL FUEL

In order to reduce diesel emissions, the Contractor shall use Ultra Low Sulfur Diesel (ULSD) fuel to operate all diesel engines used to complete the work that will operate for 10 hours or more on the contract site. ULSD fuel requirements shall apply to:

- All diesel engines/equipment.
- Stationary and mobile equipment.
- Owned, leased and rented equipment.

The hours the piece of equipment is used to complete the work is defined as the actual time the engine is running. The time may be continuous or discontinuous and includes warm-up periods idling, in traffic periods, etc.

The Contractor shall repair deficiencies when any diesel powered construction equipment is in non-compliance. When non-compliance items are identified by NYSTA, the Contractor will be notified for correction within a 24-hour period.

SPECIAL NOTES

GREEN CONSTRUCTION REQUIREMENTS

CONTROLLING EXPOSURE TO DIESEL EXHAUST

The Contractor shall exercise measures to protect "Sensitive Receptors" from the impacts of diesel exhaust fumes. Sensitive Receptors include, but are not limited to: hospitals, schools, daycare facilities, building fresh air or ventilation intakes, elderly housing or convalescent facilities. The Contractor shall ensure that diesel powered engines are located away from building air conditioners and windows.

The goal is to minimize exposure of Sensitive Receptors in close proximity to diesel exhaust, in terms of both concentration and time. In general, close proximity is defined as within 15 meters of a Sensitive Receptor. Mitigation techniques include positioning stationary equipment exhausts greater than 15 meters from Sensitive Receptors, extension of equipment exhausts through the use of flexible tubing; protecting building air intakes; and the use of moving operations.

Idling time for diesel powered equipment shall be limited to three consecutive minutes for delivery and dump trucks and all other diesel powered equipment except as follows:

- When a "mobile source" (vehicle) is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control.
- When it is necessary to operate a loading, unloading or processing device.
- When the outdoor temperature is less than - 3°C (27°F).
- When the "mobile source" is being repaired.

Arrow panels and portable variable message signs shall be solar powered wherever possible or practical.

Whenever possible and practicable, the Contractor shall establish staging areas for diesel powered vehicles waiting to load or unload materials at the work site. Such areas shall be located where diesel emissions have the least impact on Sensitive Receptors and the general public.

SPECIAL NOTES

GREEN CONSTRUCTION REQUIREMENTS

DUST CONTROL

The Contractor shall minimize dust from disturbed soil surfaces or other materials that can cause off-site damage, health hazards and traffic safety problems. Dusty conditions resulting from the Contractor's operations shall be corrected at no additional cost to the State. Buffer areas of vegetation should be left where practical. Water quality shall be considered when selecting materials for dust control. An approved dust palliative may be used in conformance with applicable conditions placed on its use. A list of acceptable dust palliatives is available at: https:/www.dot.ny.gov/divisions/engineering/technical-services/geotechnical-engineering-bureau/dust-palliatives.

For areas not subject to traffic, products and materials may be applied or placed on soil surfaces to prevent airborne migration of soil particles, including:

- Vegetative Cover –provides the most practical method of dust control.
- Mulch (including rolled erosion control products) –provides a fast, effective method of dust control.
- Spray Adhesives –Generally composed of polymers in a liquid or solid form mixed with water to form an emulsion that is sprayed on the soil surface. The mixing ratios and application rates will be in accordance with the manufacturer's recommendations for the specific soils on the site. Adhesives shall not be applied to wet soils or if there is a probability of precipitation within 48 hours.

For areas subject to traffic (traveling public or construction traffic) products and materials may be applied or placed on soil surfaces to prevent airborne migration of soil particles, including:

- Water Sprinkling – The site may be sprayed with water until the surface is wet. This is especially effective on haul roads and access routes.
- Polymer Additives –Polymers shall be mixed with water and applied to the driving surface using mixing ratios and application rates in accordance with the manufacturer's recommendations. No application of the polymer will be made if there is a probability of precipitation within 48 hours of its proposed use. Any polymers must be used in accordance with the NYSDEC issued "Conditions for Use" and "Application Instructions." This information can be obtained from the NYSDEC website.
- Barriers – Woven geotextiles or stone can be placed on the driving surface to effectively reduce dust throw and particle migration on haul roads.
- Windbreak – A silt fence or similar barrier can control air currents at horizontal intervals equal to ten times the barrier height. Preserve existing vegetation that acts as a wind barrier as much as practical.
- Wheel Washing – Mechanical or manual wet-method cleaning of on-road construction vehicle tires prior to leaving site.

SPECIAL NOTE

GENERATOR KNOWLEDGE FOR DISPOSAL OF TREATED WOOD

The U.S. Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (NYSDEC) technique for evaluating whether a material is hazardous for toxicity is the Toxicity Characteristic Leaching Procedure (TCLP). TCLP testing of pentachlorophenol ("penta") and creosote treated wood by the Electric Power Research Institute, Association of American Railroads, and others has conclusively demonstrated that treated wood products are not a hazardous waste. Under EPA's and NYSDEC's rules, such "generator knowledge" can be utilized in place of testing to determine that a waste is not hazardous. This information can be used as evidence that treated wood products can be disposed as non-hazardous waste, based on generator knowledge, in lieu of physical testing.

Generator knowledge information, obtained from the American Wood Preservers Institute (AWPI) can be viewed at their web site located at www.awpi.org . AWPI's information comes from studies conducted by the Electric Power Research Institute (EPRI), the Washington Public Ports Association (WPPA), and the Association of American Railroads (AAR). EPRI test results are for both penta-treated and creosote-treated wood. WPPA and AAR test results are for creosote-treated wood.

NOTE: Arsenically-treated (*e.g.,* chromated copper arsenate [CCA]) wood products disposed by the end user are exempt from classification as a federal hazardous waste regardless of the TCLP results for specified constituents from any individual sample. Also, wood products treated with preservatives that contain no TCLP constituents (*e.g.,* Kodiak Preserved Wood containing Copper Dimethyldithiocarbamate) are not hazardous waste.

SPECIAL NOTES
FOREST INSECT DISEASE CONTROL

MOVEMENT OF WOOD MATERIALS FROM PROJECT SITES

Pursuant to New York State Department of Environmental Conservation (NYSDEC) Regulations, 6 NYCRR Section 192.5, *Firewood Restrictions to Protect Forests from Invasive Species,* it is unlawful to transport any firewood material more than 50 miles from its point of origin to limit the spread of invasive insect species. "Firewood" shall mean all wood of any species, cut or not cut, split or not split, regardless of length which is (a) in a form and size appropriate for use as a fuel, or (b) which is destined for use as a fuel. Firewood shall not include kiln-dried dimensional lumber, wood that has been chipped to a maximum piece size that is no greater than 1-inch in two dimensions, or logs or wood being transported to sawmills or other manufacturing facilities for use in their primary operations. All Thruway Authority (TA) projects are subject to this requirement. Additional information can be found at the following link: https://dec.ny.gov/nature/animals-fish-plants/invasive-species/terrestrial/firewood

If firewood is to be moved within 50 miles of its point of origin a "Self-Issued Certificate of Origin for Transport and Possession of Untreated Firewood" must be completed. This form can be found at the following link: http://www.dec.ny.gov/docs/lands_forests_pdf/selfisscert.pdf

MARKER RELOCATION DURING CONSTRUCTION
EXISTING MILE MARKERS AND TENTH-MILE MARKERS AND DELINEATORS

All Mile Markers and Tenth-Mile Markers are to be maintained during construction of this project. The Contractor will be allowed to temporarily relocate them to avoid damage to them or for constructability purposes. The Mile Markers and Tenth-Mile Markers can be moved but the new location must be visible to traffic and be reasonably close to their original location. The Mile Markers must be returned to their original location upon completion of construction at that location. Cost for this work shall be included in the bid price for the various pay items in the Project, unless the work is specifically called for in the Contract Documents.

If the Contract calls for replacement of existing Milemarkers and/or Tenth-Milemarkers, they shall remain in place, or reset to a location reasonably close to their original location, until the new markers are installed.

REINFORCEMENT FOR CEMENT CONCRETE

Bar reinforcement and wire fabric specified in the Contract Documents shall be in accordance with the following:

Bar Reinforcement used on this project shall meet the requirements of Section 709-01 *Bar Reinforcement, Grade 60*, or Section 709-14 *Bar Reinforcement, Grade 75*, as detailed on the plans. No substitutions will be allowed. Bar reinforcement (for the items listed below) shall be galvanized and fabricated in accordance with ASTM A767 and meet the requirements of Section 709-11 *Galvanized Bar Reinforcement*. The requirements of ASTM A767 Section 6.8 (Chromating) will not be waived.

Wire Fabric Reinforcement used on this project (for the items listed below) shall meet the requirements of Section 709-02 *Wire Fabric for Concrete Reinforcement*. Any Wire Fabric Reinforcement required for the items listed below shall be galvanized in accordance with Section 719-01 *Galvanized Coatings and Repair Methods*, Type I. Galvanized Wire Fabric Reinforcement shall be fabricated and galvanized in accordance with ASTM A123 and ASTM A767. The requirements of ASTM A767 Section 6.8 (Chromating) will not be waived.

Item Numbers that require the use of **Galvanized Bar Reinforcement** and/or **Galvanized Wire Fabric Reinforcement** on this project are as follows:

None

Reinforcement for Reinforced Concrete Pipe and Related Drainage Structures shall meet the requirements of Section 706 – *Concrete, Clay, and Plastic Pipe.*

SPECIAL NOTE

BIRD / BAT WASTE AWARENESS

The Contractor should be aware that there may be bird/bat waste in the work area. The waste may contain trace amounts of metals and the fungus *Histoplasma capsulatum.* Exposure to this fungus can result in the disease histoplasmosis. Proper health and safety precautions shall be identified in the contractor's health and safety plan in accordance with section 107-05. The disposal facility that accepts the bird/bat waste may need documentation as to its composition to determine that it is non-hazardous and/or otherwise suitable for disposal at that location.

COMPLIANCE REQUIRMENTS AND PROCEDURES

PARTICIPATION OPPORTUNITIES FOR NEW YORK STATE CERTIFIED MINORITY AND WOMEN-OWNED BUSINESS ENTERPRISES AND EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITY GROUP MEMBERS AND WOMEN

NEW YORK STATE LAW

Pursuant to New York State Executive Law Article 15-A and Parts 140-145 of Title 5 of the New York Codes, Rules, and Regulations, NYSTA is required to promote opportunities for the maximum feasible participation of New York State-certified Minority and Women-owned Business Enterprises ("MWBEs") and the employment of minority group members and women in the performance of NYSTA contracts.

Business Participation Opportunities for MWBEs
For purposes of this solicitation, NYSTA hereby establishes an overall goal of **10** percent for MWBE participation, **5** percent for New York State-certified Minority-owned Business Enterprise ("MBE") participation and **5** percent for New York State-certified Women-owned Business Enterprise ("WBE") participation (based on the current availability of MBEs and WBEs). A contractor ("Contractor") on any contract resulting from this procurement ("Contract") must document its good faith efforts to provide meaningful participation by MWBEs as subcontractors and suppliers in the performance of the Contract. To that end, by submitting a response to this procurement, the respondent agrees that NYSTA may withhold payment pursuant to any Contract awarded as a result of this procurement pending receipt of the required MWBE documentation. The directory of MWBEs can be viewed at: https://ny.newnycontracts.com. For guidance on how NYSTA will evaluate a Contractor's "good faith efforts," refer to 5 NYCRR § 142.8.

The respondent understands that only sums paid to MWBEs for the performance of a commercially useful function, as that term is defined in 5 NYCRR § 140.1, may be applied towards the achievement of the applicable MWBE participation goal. The portion of a contract with an MWBE serving as a supplier that shall be deemed to represent the commercially useful function performed by the MWBE shall be 60 percent of the total value of the contract. The portion of a contract with an MWBE serving as a broker that shall be deemed to represent the commercially useful function performed by the MWBE shall be the monetary value for fees, or the markup percentage, charged by the MWBE.

In accordance with 5 NYCRR § 142.13, the respondent further acknowledges that if it is found to have willfully and intentionally failed to comply with the MWBE participation goals set forth in a Contract resulting from this procurement, such finding constitutes a breach of contract and NYSTA may withhold payment as liquidated damages.

Such liquidated damages shall be calculated as an amount equaling the difference between: (1) all sums identified for payment to MWBEs had the Contractor achieved the contractual MWBE goals; and (2) all sums actually paid to MWBEs for work performed or materials supplied under the Contract.

By submitting a bid or proposal, a respondent agrees to demonstrate its good faith efforts to achieve the applicable MWBE participation goals by submitting evidence thereof through the New York State Contract System ("NYSCS"), which can be viewed at https://ny.newnycontracts.com,

provided, however, that a respondent may arrange to provide such evidence via a non-electronic method by contacting the Office of Compliance at compliance@thruway.ny.gov.

Additionally, a respondent will be required to submit the following documents and information as evidence of compliance with the foregoing:

A. An MWBE Utilization Plan with their bid or proposal. Any modifications or changes to an accepted MWBE Utilization Plan after the Contract award and during the term of the Contract must be reported on a revised MWBE Utilization Plan and submitted to NYSTA for review and approval.

   NYSTA will review the submitted MWBE Utilization Plan and advise the respondent of NYSTA acceptance or issue a notice of deficiency within 30 days of receipt.

B. If a notice of deficiency is issued, the respondent will be required to respond to the notice of deficiency within seven (7) business days of receipt by submitting to the Office of Compliance at compliance@thruway.ny.gov, a written remedy in response to the notice of deficiency. If the written remedy that is submitted is not timely or is found by NYSTA to be inadequate, NYSTA shall notify the respondent and direct the respondent to submit, within five (5) business days, a request for a partial or total waiver of MWBE participation goals. Failure to file the waiver form in a timely manner may be grounds for disqualification of the bid or proposal.

NYSTA may disqualify a respondent as being non-responsive under the following circumstances:

a) If a respondent fails to submit an MWBE Utilization Plan;
b) If a respondent fails to submit a written remedy to a notice of deficiency;
c) If a respondent fails to submit a request for waiver; or
d) If NYSTA determines that the respondent has failed to document good faith efforts.

The successful respondent will be required to attempt to utilize, in good faith, any MBE or WBE identified within its MWBE Utilization Plan, during the performance of the Contract. Requests for a partial or total waiver of established goal requirements made subsequent to Contract Award may be made at any time during the term of the Contract to NYSTA, but must be made no later than prior to the submission of a request for final payment on the Contract. The successful respondent will be required to submit a monthly MWBE Contractor Payment Report to NYSTA, by the 10th day of each month over the term of the Contract documenting the progress made toward achievement of the MWBE goals of the Contract.

Equal Employment Opportunity Requirements
By submission of a bid or proposal in response to this solicitation, the respondent agrees to comply with all Authority Compliance Requirements and Procedures, in accordance with the terms and conditions of Appendix A – Standard Clauses for New York State Thruway Authority Contracts including Clause 4 – Non-Discrimination Requirements and Clause 11 - Equal Employment Opportunities for Minorities and Women.

The respondent is required to ensure that it and any subcontractors awarded a subcontract for the construction, demolition, replacement, major repair, renovation, planning or design of real property

and improvements thereon (the "Work"), except where the Work is for the beneficial use of the respondent, undertake or continue programs to ensure that minority group members and women are afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status. For these purposes, equal opportunity shall apply in 14 the areas of recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff, termination, and rates of pay or other forms of compensation. This requirement does not apply to: (i) work, goods, or services unrelated to the Contract; or (ii) employment outside New York State.

The respondent will be required to submit a Minority and Women-owned Business Enterprise and Equal Employment Opportunity Policy Statement, Form EEO-1, to NYSTA with its bid or proposal.

If awarded a Contract, respondent shall submit a Workforce Utilization Report, TA-W1017 and shall require each of its Subcontractors to submit a Workforce Utilization Report, in such format as shall be required by NYSTA on a MONTHLY basis during the term of the Contract.

Pursuant to Executive Order #162, contractors and subcontractors will also be required to report the gross wages paid to each of their employees for the work performed by such employees on the contract utilizing the Workforce Utilization Report, TA-W1017 on a quarterly basis.

Further, pursuant to Article 15 of the Executive Law (the "Human Rights Law"), all other State and Federal statutory and constitutional non-discrimination provisions, the Contractor and sub contractors will not discriminate against any employee or applicant for employment because of race, creed (religion), color, sex, national origin, sexual orientation, military status, age, disability, predisposing genetic characteristic, marital status or domestic violence victim status, and shall also follow the requirements of the Human Rights Law with regard to non-discrimination on the basis of prior criminal conviction and prior arrest.

Please Note: Failure to comply with the foregoing requirements may result in a finding of non responsiveness, non-responsibility and/or a breach of the Contract, leading to the withholding of funds, suspension or termination of the Contract or such other actions or enforcement proceedings as allowed by the Contract.

The required forms can be found at the following web addresses:

Form EEO-1 - EEO Policy Statement: https://www.thruway.ny.gov/sites/default/files/2026-04/EEO-1-EEO-Policy-Statement.pdf?v=1785246977

Form EEO-2 - EEO Staffing Plan: https://www.thruway.ny.gov/sites/default/files/2026-04/EEO-2-EEO-Staffing-Plan.pdf?v=1785246977

TA-W1017 - EO 162 Workforce Utilization Report: https://www.thruway.ny.gov/sites/default/files/2025-07/ta-w1017.xlsx?v=1785246977

TA-W1022 - Contractor Utilization Plan: https://www.thruway.ny.gov/sites/default/files/2025-07/ta-w1022.pdf?v=1785246977

TA-W1023 - Contractor Payments: https://www.thruway.ny.gov/sites/default/files/2025-07/ta-w1023.pdf?v=1785246977

TA-W1077 - Contractor/Consultant Waiver Request: https://www.thruway.ny.gov/sites/default/files/2025-07/ta-w1077.pdf?v=1785246977

TA-W1037 - Contractor AAPHC-89 - DBE/MWBE Utilization Worksheet/Approval to Subcontract: https://www.thruway.ny.gov/sites/default/files/2025-07/ta-w1037.xls?v=1785246977

TA-W1074 - Contractor Amended AAPHC-89 - DBE/MWBE Utilization Worksheet/Approval to Subcontract: https://www.thruway.ny.gov/sites/default/files/2025-07/ta-w1074.xls?v=1785246977

If the above links are unavailable or inactive, the forms may also be requested from the Office of Compliance at compliance@thruway.ny.gov.

PARTICIPATION OPPORTUNITIES FOR NEW YORK STATE CERTIFIED SERVICE-DISABLED VETERAN OWNED BUSINESSES

Article 3 of the New York State Veterans' Services Law provides for more meaningful participation in public procurement by certified Service-Disabled Veteran-Owned Businesses ("SDVOB"), thereby further integrating such businesses into New York State's economy. NYSTA 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 NYSTA 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 expected to consider SDVOBs in the fulfillment of the requirements of the Contract. Such participation may be as subcontractors or suppliers, as protégés, or in other partnering or supporting roles.

Contract Goals

A. NYSTA hereby establishes an overall goal of **3%** for SDVOB participation, based on the current availability of qualified SDVOBs. For purposes of providing meaningful participation by SDVOBs, the Bidder/Contractor should reference the directory of New York State Certified SDVOBs found at: https://sdves.ogs.ny.gov/business-search. Questions regarding compliance with SDVOB participation goals should be directed to the Designated Contacts. Additionally, following Contract execution, Contractor is encouraged to contact the Office of General Services' Division of Service-Disabled Veterans' Business Development at 518 474-2015 or veteransdevelopment@ogs.ny.gov.. to discuss additional methods of maximizing participation by SDVOBs on the Contract.

B. Contractor must document "good faith efforts" to provide meaningful participation by SDVOBs as subcontractors or suppliers in the performance of the Contract.

SDVOB Utilization Plan

A. In accordance with 9 NYCRR § 252.2(i), Bidders are required to submit a completed SDVOB Utilization Plan on Form TA-W1022.

B. The Utilization Plan shall list the SDVOBs that the Bidder intends to use to perform the Contract, a description of the work that the Bidder intends the SDVOB to perform to meet the goals on the Contract, the estimated dollar amounts to be paid to an SDVOB, or, if not known, an estimate of the percentage of Contract work the SDVOB will perform. By signing the Utilization Plan, the Bidder acknowledges that making false representations or providing information that shows a lack of good faith as part of, or in conjunction with, the submission of a Utilization Plan is prohibited by law and may result in penalties including, but not limited to, termination of a contract for cause, loss of eligibility to submit future bids, and/or withholding of payments. Any modifications or changes to the agreed participation by SDVOBs after the Contract award and during the term of the Contract must be reported on a revised SDVOB Utilization Plan and submitted to NYSTA.

C. NYSTA will review the submitted SDVOB Utilization Plan and advise the Bidder/Contractor of NYSTA acceptance or issue a notice of deficiency within 20 days of receipt.

D. If a notice of deficiency is issued, Bidder/Contractor agrees that it shall respond to the notice of deficiency, within seven (7) business days of receipt, by submitting to NYSTA a written remedy in response to the notice of deficiency. If the written remedy that is submitted is not timely or is found by NYSTA to be inadequate, NYSTA shall notify the Bidder/Contractor and direct the Bidder/Contractor to submit, within five business days of notification by NYSTA, a request for a partial or total waiver of SDVOB participation goals on TA-W1077. Failure to file the waiver form in a timely manner may be grounds for disqualification of the bid or proposal.

E. NYSTA may disqualify a Bidder's bid or proposal as being non-responsive under the following circumstances:

(a) If a Bidder fails to submit an SDVOB Utilization Plan;
(b) If a Bidder fails to submit a written remedy to a notice of deficiency;
(c) If a Bidder fails to submit a request for waiver; or
(d) If NYSTA determines that the Bidder has failed to document good faith efforts.

F. If awarded a Contract, Contractor certifies that it will follow the submitted SDVOB Utilization Plan for the performance of SDVOBs on the Contract pursuant to the prescribed SDVOB contract goals set forth above.

G. Contractor further agrees that a failure to use SDVOBs as agreed in the Utilization Plan shall constitute a material breach of the terms of the Contract. Upon the occurrence of such a material breach, NYSTA shall be entitled to any remedy provided herein, including but not limited to, a finding of Contractor non-responsibility.

Request for Waiver

A. Prior to submission of a request for a partial or total waiver, Bidder/Contractor shall speak to the Designated Contacts at NYSTA for guidance.

B. In accordance with 9 NYCRR § 252.2(m), a Bidder/Contractor that is able to document good faith efforts to meet the goal requirements, as set forth in clause IV below, may submit a

request for a partial or total waiver on Form TA-W1077, accompanied by supporting documentation. A Bidder may submit the request for waiver at the same time it submits its SDVOB Utilization Plan. If a request for waiver is submitted with the SDVOB Utilization Plan and is not accepted by NYSTA at that time, the provisions of clauses II (C), (D) & (E) will apply. If the documentation included with the Bidder's/Contractor's waiver request is complete, NYSTA shall evaluate the request and issue a written notice of acceptance or denial within 20 days of receipt.

C. Contractor shall attempt to utilize, in good faith, the SDVOBs identified within its SDVOB Utilization Plan, during the performance of the Contract. Requests for a partial or total waiver of established goal requirements made subsequent to Contract award may be made at any time during the term of the Contract to NYSTA, but must be made no later than prior to the submission of a request for final payment on the Contract.

D. If NYSTA, upon review of the SDVOB Utilization Plan and Monthly SDVOB Compliance Report (TA-W1023) determines that Contractor is failing or refusing to comply with the contract goals and no waiver has been issued in regards to such non-compliance, NYSTA may issue a notice of deficiency to the Contractor. The Contractor must respond to the notice of deficiency within seven business days of receipt. Such response may include a request for partial or total waiver of SDVOB contract goals.

Waiver requests should be sent to the Office of Compliance at compliance@thruway.ny.gov.

Required Good Faith Efforts
In accordance with 9 NYCRR § 252.2(n), Contractors must document their good faith efforts toward utilizing SDVOBs on the Contract. Evidence of required good faith efforts shall include, but not be limited to, the following:

(1) Copies of solicitations to SDVOBs and any responses thereto.
(2) Explanation of the specific reasons each SDVOB that responded to Bidders/Contractors' solicitation was not selected.
(3) Dates of any pre-bid, pre-award or other meetings attended by Contractor, if any, scheduled by NYSTA with certified SDVOBs whom NYSTA determined were capable of fulfilling the SDVOB goals set in the Contract.
(4) Information describing the specific steps undertaken to reasonably structure the Contract scope of work for the purpose of subcontracting with, or obtaining supplies from, certified SDVOBs.
(5) Other information deemed relevant to the waiver request.

Monthly SDVOB Contractor Payment Report
In accordance with 9 NYCRR § 252.2(q), Contractor is required to report Monthly SDVOB Contractor Payments to NYSTA during the term of the Contract for the preceding month's activity, documenting progress made towards achieving the Contract SDVOB goals. This information must be submitted using form TA-W1023 available on NYSTA's website and should be completed by the Contractor and submitted to NYSTA, by the 10th day of each month during the term of the Contract, for the preceding month's activity to: compliance@thruway.ny.gov.

STATE WAGE RATE INFORMATION

WAGE RATES

The New York State Thruway Authority does not represent or warrant that the accompanying schedule of wages with the classification of workmen, mechanics and laborers, as required by Section 220 of the Labor Law, is complete and it reserves the right to revise such schedule when required.

In the event that revisions are made before the letting date, an amendment will be issued by the Department of purchasers of plans. In the event that the current wage rate schedule should expire before the contract for this project becomes effective the said wage rate schedule will be recertified and the Contractor will be bound by such revised schedule as recertified.

Labor classifications not appearing on this rate sheet can be used only with the consent of the Chief Engineer of the Authority and then the rate to be paid will be given by the Chief Engineer of the Authority after consulting with the State Department of Labor.

All requests for minimum wage rates for additional occupations shall be directed through the Chief Engineer, Thruway Authority.

By legislation effective August 9, 1975, if the prevailing rate of wages or the prevailing practices for supplements as determined by the State Labor Department changes after the contract is let, the Thruway Authority shall request of the State Labor Department a redetermination of the schedules of wages and supplements and such revised wage rates and supplements shall be annexed to and form a part of the contract for the work. The prevailing wage rates and supplemental benefits to be paid are those in effect at the time the work is being performed. The bidder shall take into account in his bid prices all changes in wage rates and supplements that may be forthcoming during the time the contract is in force.

The bidder shall take into account in his bid prices all changes in wage rates and supplements that may be forthcoming during the time the contract is in force.

Pursuant to Section 220-A of the New York State Labor law, the prime Contractor must provide each approved subcontractor with a copy of the schedule of wages and any supplements as specified in this Contract.

The prime Contractor must immediately obtain from each approved subcontractor a certification (TA-44105) of their receipt of, and agreement to pay the applicable prevailing wages as specified in this contract. The prime Contractor shall retain all Subcontractor certifications and provide these certifications to the Authority prior to the processing of the final payment.

The prime Contractor must submit an affidavit (TA-44115) verifying the proper payment of wages to its own employees prior to the processing of the final payment. All completed certifications and affidavits must be originals and be properly signed and notarized.

SPECIAL NOTICE TO BIDDERS IN RELATION TO OVERTIME DISPENSATION

All bidders, in submitting their bids, should base their bids and work progression on the assumption that Overtime Dispensation pursuant to Article 8 of the New York State Labor Law, for any workmen, laborers and mechanics to work more than 8 hours in any one calendar day or more than five days in any one week will not be granted for any operation for the contract duration. Subsequent to award, where the contract documents have imposed specific scheduling and/or phasing requirements or where it is determined by the Authority to be in the best interest of the public, the Authority may process, for approval by the new York State Department of Labor, requests for Overtime Dispensation on certain specific operations and, in the event approval is granted, there shall be no adjustments therefore in any bid prices.

SPECIAL NOTE
STATE PREVAILING WAGE RATES

The Contractor shall ensure that workers are paid the appropriate wages and supplemental (fringe) benefits. Throughout the contract, the Contractor shall obtain and pay workers in accordance with periodic wage rate schedule updates from the NYS Department of Labor (NYSDOL). Wage rate amendments and supplements are available on the NYSDOL web site at https://dol.ny.gov/bureau-public-work-and-prevailing-wage-enforcement. All changes or clarification of labor classification(s) and applicability of prevailing wage rates shall be obtained in writing from the Office of the Director, NYSDOL Bureau of Public Work.

The NYSDOL prevailing wage rate schedule for this contract has been determined and is available on the internet. The prevailing wage rate schedule is accessed by visiting the NYSDOL web site, navigating to the appropriate web page, and entering the Prevailing Rate Case No. (PRC#). The PRC# is provided on NYSDOL Form PW-200 included in this contract Proposal.

A copy of the project specific prevailing wage rate schedule will be provided to the successful bidder upon award of the contract. Upon written request, the schedule will be provided by the Thruway Authority to prospective bidders without internet access.

The Thruway Authority is providing information regarding the new Public Work Contractor and Subcontractor Registry requirement recently enacted by New York State.

Starting December 30, 2024, all contractors and subcontractors submitting bids or performing construction work on public work projects or private projects covered by Article 8 of the Labor Law are required to register with the New York State Department of Labor (NYSDOL) under Labor Law Section 220-i.

Private projects subject to Article 8 of the Labor Law include those covered by Labor Law Sections 224-a (public subsidy funded projects), 224-d (renewable energy systems), 224-e (broadband projects), 224-f (climate risk-related and energy transition projects and roadway excavations.)

The law defines a “contractor” as any entity entering into a contract to perform construction, demolition, reconstruction, excavation, rehabilitation, repair, installation, renovation, alteration or custom fabrication. The law defines “subcontractor” as any entity subcontracting with a contractor to perform construction, demolition, reconstruction, excavation, rehabilitation, repair, installation, renovation, alteration or custom fabrication, which is subject to Article 8 of the Labor Law. Contractors are responsible for verifying that any subcontractors they work with are registered.

Contractors need to register before submitting any new bids or commencing new work on a covered project on or after December 30, 2024. Subcontractors also need to register before commencing new work on a covered project on or after December 30, 2024. The Thruway Authority encourages all contractors and subcontractors to register as soon as possible and obtain a Certificate of Registration to avoid negatively impacting a bidding period or project schedule.

Information required to register from the New York State Department of Labor's website for this process can be found here: https://dol.ny.gov/contractor-and-subcontractor-landing. For any further questions you can also contact the Bureau of Public Work and Prevailing Wage at 518-457-5589.

Kathy Hochul, Governor

Roberta Reardon, Commissioner

NYS Thruway Authority

Antonio Melendez, Professional Engineer 1
200 Southern Boulevard
Albany NY 12209

Schedule Year	2026 through 2027
Date Requested	09/11/2026
PRC#	2026026583

Location	Milepost 310.0 Eastbound
Project ID#	D215118
Project Type	Rehabilitation of the Wastewater Treatment Plant at the Port Byron Service Area on I-90, Milepost 310.0 EB in Cayuga County

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

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

The schedule is effective from July 2026 through June 2027. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

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

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

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

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

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

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

Introduction

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

Contractor Registry

Effective December 30, 2024 all contractors and subcontractors submitting bids or performing construction work on public work projects, or private projects covered by Article 8 of the Labor Law, are required to register with the New York State Department of Labor (NYSDOL) under Labor Law Section 220-i. To register, contractors and subcontractors must submit an application through NYSDOL's Contractor Registry portal which is available through the agency's Management System for Protecting Worker Rights (MPWR) https://mpwr-public.labor.ny.gov/en/login.

For additional information, please visit online.

Responsibilities of the Department of Jurisdiction

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

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

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

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

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

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12226; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

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

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

www.labor.ny.gov.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemperaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment.Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

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

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

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

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

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

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

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

Withholding of Payments

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

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

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

Summary of Notice Posting Requirements

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

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

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

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

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

Apprentices

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

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

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12226 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

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

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

Interest and Penalties

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

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

Debarment

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

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

Criminal Sanctions

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

Discrimination

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

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

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

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

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

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

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

Workers' Compensation

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

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

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

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

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

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

Unemployment Insurance

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

Kathy Hochul, Governor

Roberta Reardon, Commissioner

NYS Thruway Authority

Antonio Melendez, Professional Engineer 1
200 Southern Boulevard
Albany NY 12209

Schedule Year 2026 through 2027
Date Requested 09/11/2026
PRC# 2026026583

Location	Milepost 310.0 Eastbound
Project ID#	D215118
Project Type	Rehabilitation of the Wastewater Treatment Plant at the Port Byron Service Area on I-90, Milepost 310.0 EB in Cayuga County

Notice of Contract Award

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

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

Contractor Information
All information must be supplied

Federal Employer Identification Number: _____

Name: _____

Address: _____

_____

City: _____ State: _____ Zip: _____

Amount of Contract: $_____

Approximate Starting Date: ____/____/____

Approximate Completion Date: ____/____/____

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

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12226

Social Security Numbers on Certified Payrolls:

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

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to $1,500 for a first offense and up to $5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, https://dol.ny.gov/public-work-and-prevailing-wage
If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov .

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

Effective June 23, 2020

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

(12.20)

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

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

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1. Purpose and Scope:

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

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

2. Background and Statutory References:

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

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

3. Procedures and Agency Responsibilities:

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

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

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

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

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

Reports should contain the following information:

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

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

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12226

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

NEW YORK STATE OF OPPORTUNITY. Department of Labor

Required Notice under Article 25-B of the Labor Law

Attention All Employees, Contractors and Subcontractors: You are Covered by the Construction Industry Fair Play Act

The law says that you are an employee unless:

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

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

It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.

Employee Rights: If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor**, you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

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

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

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

Employer Name:

IA 999 (09/16)

WE ARE YOUR DOL

NEW YORK STATE Department of Labor

New York State Department of Labor
Bureau of Public Work

Attention Employees

THIS IS A:

PUBLIC WORK PROJECT

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

Your pay stub and wage notice received upon hire must clearly state your wage rate and supplement rate.

Chapter 629 of the Labor Laws of 2007:

These wages are set by law and must be posted at the work site. They can also be found at: https://dol.ny.gov/bureau-public-work

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

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 932-2419	White Plains	(914) 997-9507
Newburgh	(845) 568-5287		

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

Contractor Name: _____

Project Location: _____

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is $250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

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

Proof of completion may include but is not limited to:

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

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

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

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

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.
Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.
Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.
Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

*Contractor Registry (LL 220-I):
Labor Law Section 220-i requires that contractors obtain a Contractor Registry certificate of registration prior to bidding on or commencing work on a public or private project subject to prevailing wage requirements. Subcontractors also are prohibited from commencing work on covered employment unless they have received a Contractor Registry certificate. Contractors are required to submit their Certificate of Registration with their bid materials. A public database is available online to confirm registration at data.ny.gov to confirm registration validity. For additional information on how to register and the requirements, visit https://dol.ny.gov/public-work-contractor-and-subcontractorregistry-
landing.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. Payrolls must be maintained for at least three (3) years from the projects date of completion. Additionally, as per Article 6 of the Labor Law, contractors and subcontractors are required to establish, maintain, and preserve for not less that six (6) years, contemporaneous, true, and accurate payroll records.

At a minimum, payrolls must show the following information for each person employed on a public work project: Name; Address, Last 4 Digits of Social Security number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid or provided, and Daily and weekly number of hours worked in each classification.

Payroll records and transcripts are required to be kept on site during all the time that work under that contract is being performed.

NOTE: *For more detailed information regarding Article 9 prevailing wage contracts, please refer to "General Provisions of Laws Covering Workers on Article 9 Public Work Building Service Contracts".*

If you have any questions concerning the attached schedule or would like additional information, please write to:

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

OR

Contact the nearest BUREAU of PUBLIC WORK District Office

District Office Locations:	Telephone #	FAX #
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Garden City	516-228-3915	516-794-3518

Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

Paid Holidays

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

Overtime

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

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

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

Supplemental Benefits

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

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. Please Note: Updates to the Wage Schedule shall be made on a quarterly basis.

All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Shift Work

If the timeline of the contract requires shift work be performed to meet deadlines, the BPWE will enforce the shift work rate as the required rate on the project whether or not shift work is specifically addressed in the contract.

Paid Prenatal Leave

Every employer shall be required to provide to its employees twenty hours of paid prenatal personal leave during any fifty-two week calendar period. Paid prenatal personal leave shall mean leave taken for the health care services received by an employee during their pregnancy or related to such pregnancy, including physical examinations, medical procedures, monitoring and testing, and discussions with a healthcare provider related to the pregnancy. Paid prenatal personal leave may be taken in hourly increments. Benefits for paid prenatal personal leave shall be paid in hourly installments. Employees shall receive compensation at the employee's regular rate of pay, or the applicable minimum wage established by the labor law, whichever is greater, for the use of Paid Prenatal leave.

Apprentice Training Ratios

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

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

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

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4

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

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

New York State Department of Labor
Bureau of Public Work
State Office Campus, Bldg. 12
Albany, NY 12226

District Office Locations:	Telephone #	FAX #
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Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

AGREEMENT, FAITHFUL PERFORMANCE BOND, AND LABOR AND MATERIAL BOND

CONTRACT NO:

COUNTY:

NEW YORK STATE

THRUWAY AUTHORITY

A G R E E M E N T

NEW YORK STATE THRUWAY AUTHORITY

AGREEMENT

CONTRACT NO:

This **AGREEMENT**, entered into this day of , by the**NEW YORK STATE THRUWAY AUTHORITY** (hereinafter referred to as the "**AUTHORITY**")having its principal office at 200 Southern Blvd. (P. O. Box 189, Albany, NY 12201) in the County of Albany and State of New York and hereinafter called the"**CONTRACTOR**",

☐ a corporation organized and existing under the laws of the State of

☐ a partnership, consisting of

☐ an individual conducting business as

the location of whose principal office is

WITNESSETH: That the Authority and the Contractor for the consideration hereinafter named agree as follows**:**

ARTICLE 1. WORK TO BE DONE.
The Contractor shall (a) furnish all the materials, appliances, tools and labor of every kind required, and construct and complete in the most substantial and skillful manner, the construction, improvement or reconstruction of the project on or before the completion date of the as further described in ARTICLE 4, and as generally identifiedand shown on the plans entitled:

in accordance with the "Standard Specifications" of the New York State Department of Transportation, which contain the information for bidders; form of proposal, agreement, and bonds; general specifications and conditions or contract; materials of construction; and payment Items; and (b) do everything required by the Contract (Contract Documents) as defined herein.

The Contractor agrees that its proposal contained herein is based upon performing all the work of the Contract in accordance with a schedule that will result in the completion of the total works by the Date of Completion of the Contract and all intermediate stage and phase completion requirements of the contract, while adhering to all restrictions set forth in the Schedule and Suspension of Work, the Thruway Traffic Plan, and the General and Special Notes, and that the work will be performed at the unit bid prices, as shown on the contract documents and as detailed in the specifications and notes, utilizing the Labor Force, Qualified Disadvantaged, Women Owned and Minority Owned Subcontractor Entrepreneurs and Methods and Materials of Construction as described in the Contract Documents and any incorporated Addenda thereto, and conduct its operations in accordance with the Vehicle and Traffic Law, the Rules and Regulations of the NYS Thruway Authority, and theThruway Operating Rules and General and Special Notes that are part of this proposal. The Contractor further agrees its proposal is not based upon the assumption that any specifications, traffic restrictions, scheduling or phasing/staging requirements will be waived, an extension of Contract Completion Date will be granted, a labor dispensation will be granted, substitution of non-approved products, alternatives or claimed functional equivalents for Specified Construction Materials and Methods will be allowed, or any Value Engineering Proposals will be entertained and approved by the New York State Thruway Authority, and any requests for a substitution, equivalent or alternate, which it proposes, will be accompanied by an agreed price analysis establishing an applicable credit or illustrating cost equal to or greater than the bid amount.

ARTICLE 2. DOCUMENTS FORMING THE CONTRACT.

The Contract (and Contract Documents) shall be deemed to include the advertisement for proposals; the contractor's proposal; the Schedule for Participation By Disadvantaged Business Enterprise Participation goals; the agreement; the "Standard Specifications" including all addenda thereto referred to above; the plans; any addenda and/or amendments to specifications if the same are issued prior to date of receipt of proposal and all provisions required by law to be inserted in the contract whether actually inserted or not. Appendix A, standard clauses for all N.Y State contracts, is attached hereto and is hereby made a part of this agreement as if set forth fully herein.

ARTICLE 3. EXAMINATION OF DOCUMENTS AND SITE.

The Contractor agrees that before making its proposal it carefully examined the contract documents, together with the site of the proposed work, as well as its surrounding territory, and is informed regarding all of the conditions affecting the work to be done and labor and materials to be furnished for the completion of this contract, including the existence of poles, wires, pipes, and other facilities and structures of municipal and other public service corporations on, over or under the site, except latent conditions that meet the requirements of §104-04 and §109-05, and that its information was secured by personal investigation and research.

ARTICLE 4. DATE OF COMPLETION.

The Contractor further agrees that it will begin the work herein embraced within ten days of the effective date hereof, unless the consent of the Authority, in writing, is given to begin at a later date, and that it will prosecute the same so that it shall be entirely completed and performed on or before the completion date shown in Article 1.

No extension beyond the date of completion fixed by the terms of this contract shall be effective unless in writing signed by the Authority. Such extension shall be for such time and upon such terms and conditions as shall be fixed by the Authority, which may include the assessment of liquidated damages and a charge for engineering and inspection expenses actually incurred upon the work, including engineering and inspection expenses incurred upon the work by railroad companies on contracts for grade crossing elimination. Notice of application for such extension shall be filed with the Chief Engineer, Department of Engineering of the Authority at least fifteen days prior to the date of completion fixed by the terms of this agreement.

ARTICLE 5. ALTERATIONS AND OMISSIONS.

The said work shall be performed in accordance with the true intent and meaning of the contract documents without any further expense of any nature whatsoever to the Authority other than the consideration named in this agreement.

The Authority reserves the right at any time during the progress of the work, to alter the plans or omit any portion of the work as it may deem reasonably necessary for the public interest; making allowances for additions and deductions with compensation made in accordance with the Standard Specifications, for this work without constituting grounds for any claim by the contractor for allowance for damages or for loss of anticipated profits, or for any variations between the approximate quantities and the quantities of the work as done.

ARTICLE 6. NO COLLUSION OR FRAUD.

The Contractor hereby agrees that the only person or persons interested as principal or principals in the bid or proposal submitted by the Contractor for this contract are named therein, and that no person other than those mentioned therein has any interest in the above-mentioned proposal or in securing of the award, and that this contract has been secured without any connection with any person or persons other than those named, and that the proposal is in all respects fair and was prepared and the contract was secured without collusion or fraud and that neither any officer nor employee of the New York State Thruway Authority or the State Department of Transportation or either of them has or shall have a financial interest in the performance of the contract or in the supplies, work or business to which it relates, or in any portion of the profits thereof. (See also Section 139-a and 139-b of the State Finance Law referred to in the Standard Specifications, which are made a part of this contract.)

ARTICLE 7. CONTRACT PAYMENTS.

As the work progresses in accordance with the contract and in a manner that is satisfactory to the Authority, the Authority hereby agrees to make payments to the Contractor therefore, based upon the proposal attached hereto and made a part hereof, as follows: The Authority shall, once in each month and on such days as it may fix, make an estimate of the quantity of work done and of material which has actually been put in place in accordance with the terms and conditions of the contract, during the preceding month, and compute the value thereof and pay to the Contractor the moneys due in accordance with Public Authorities Law Section 2880, as detailed in 21 NYCRR Part 109 (Prompt Payment). No monthly estimate shall be rendered unless the Contractor has provided acceptable documentation with regard to actions taken to comply with the M/WBE goals of the contract (see also §109-06 Contract Payments) and the value of the work done equals 5% of the contract amount or $1,000, whichever is the lesser. Semi-monthly estimates may be rendered provided (a) the value of the work performed in two successive weeks is more than $100,000 or (b) the Chairman of

the Authority deems it to be for the best interest of the Authority to do so.

Contractor understands and agrees that payments will only be rendered electronically unless payment by paper check is expressly authorized by the Authority, in its sole discretion, due to extenuating circumstances. Contractor shall comply with the Authority's procedures to authorize electronic payments. Authorization forms are available at https://www.thruway.ny.gov/business/forms-guidelines#purchasing-services, by e-mail at suppliermgmt@thruway.ny.gov, or by telephone at (518) 436-2859. Contractor acknowledges that it will not receive payment of any estimates submitted under this Agreement if it does not comply with the Authority's electronic payment procedures, except where the Authority has expressly authorized payment by paper check as set forth above.

ARTICLE 8. PAYMENT DUE TO CONTRACTOR'S NON-COMPLIANCE.
It is further agreed that so long as any lawful or proper direction concerning the work or material given by the Chief Engineer, Department of Engineering of the New York State Thruway Authority, or his/her representative, shall remain uncomplied with, the Contractor shall not be entitled to have any estimate made for the purpose of payment, nor shall any estimate be rendered on account of work done or material furnished until such lawful or proper direction aforesaid has been fully and satisfactorily complied with.

ARTICLE 9. FINAL ACCEPTANCE OF WORK.
When in the opinion of the Thruway Division Director, a Contractor has fully performed the work under the contract, the Thruway Division Director shall recommend to the Chief Engineer, Department of Engineering of the New York State Thruway Authority, the acceptance of the work so completed. If the Chief Engineer, Department of Engineering accepts the recommendation of the Thruway Division Director, he/she shall thereupon by letter notify the Contractor of such acceptance. Copies of such acceptance shall be sent to other interested parties. Prior to the final acceptance of the work by the Chief Engineer, Department of Engineering of the New York State Thruway Authority or a designee, the contract work may be inspected, accepted and approved by other agencies and/or municipalities who will have jurisdiction of the work after final acceptance.

Final acceptance shall be final and conclusive except for defects not readily ascertainable by the New York State Thruway Authority, actual or constructive, fraud, gross mistakes amounting to fraud or other errors which the Contractor knew or should have known about as well as the New York State Thruway Authority's rights under any warranty or guarantee. Final acceptance may be revoked by the New York State Thruway Authority at any time prior to the issuance of the final check, upon the New York State Thruway Authority's discovery of such defects, mistakes, fraud or errors in the work.

ARTICLE 10. FINAL PAYMENT.
After the final acceptance of the work, the Engineer shall prepare a final agreement of the work performed and the materials placed and shall compute the value of such work and materials under and according to the terms of the contract.

This agreement shall be certified, as to its correctness, by the Engineer. Upon approval of such final agreement by the Director, Office of Construction Management, it shall be submitted to the Chief Engineer,

Department of Engineering for final approval. The right, however, is hereby reserved to the Chief Engineer, Department of Engineering to reject the whole or any portion of the final agreement, should the said certificate of the Engineer be found or known to be inconsistent with the terms of the agreement or otherwise improperly given. All certificates, upon which partial payments may have been made being merely estimates, shall be subject to correction in the final certificate or final agreement.

ARTICLE 11. RIGHT TO SUSPEND WORK AND CANCEL CONTRACT.

Article 11.1 General Right to Suspend and Cancel Contract.

It is further mutually agreed that if at any time during the prosecution of the work the Authority shall determine that the work is not being performed in accordance with the Contract or for the best interest of the Authority, the Chief Engineer, Department of Engineering, may proceed in any of the following ways:

1) Temporarily suspend the execution of the work by the Contractor, and the Chief Engineer of the Authority may then proceed with the work under his/her own direction in such manner as will accord with the Contract Documents and be for the best interests of the Authority; or

2) Terminate the Contract while it is in progress, and thereupon proceed with the work by a new contract negotiated or publicly advertised, by the use of his/her own forces, by calling upon the Surety to complete the Work in accordance with the Contract Documents, or by a combination of any such methods; or

3) Cancel the Contract and re-advertise and re-procure in accordance with applicable law; or

4) Complete the Work under the Authority's direction in such a manner as will accord with the Contract Documents and be for the best interests of the Authority.

Any excess in the cost of completing the Contract beyond the Contract Price for which it was originally awarded shall be charged to and paid by the Contractor failing to perform the Work or its Surety, all pursuant to the provisions of Section 40 of the New York State Highway Law.

In the event of suspension or termination, the Contractor shall be paid its costs, including contract close-out costs, and profit on work satisfactorily performed and project design costs actually incurred up to the time of termination, less an amount necessary to satisfy any claims, liens or judgments against the Contractor. The Contractor shall promptly submit its termination claim. The Contractor will only be paid the contract price for materials delivered and accepted, or services performed in accordance with the manner or performance set forth in this contract, less an amount necessary to satisfy any claims, liens or judgments against the Contractor.

Whenever the Authority determines to suspend or stop Work under this Contract, a written notice sent by mail to the Contractor at its address and to its Sureties at their respective addresses shall be sufficient notice of its action in the premises.

Article 11.2 Termination for Cause.

A. If at any time during the prosecution of the work the Chief Engineer shall determine that the work under the Contract is not being performed according to the Contract or any

provision of the Contract is violated by the Contractor or by any subcontractor or that an Event of Default (as defined below) has occurred hereunder, the Chief Engineer, in his or her sole and absolute discretion, may proceed in any of the following ways:

(1) Suspend or stop work by the Contractor, and the Chief Engineer may then complete the Work under his/her own direction in such manner as further described in the Contract Documents and as determined by the Chief Engineer to be in the best interests of the Authority; or

(2) Terminate the Contract while it is in progress, and thereupon complete the work by: a new contract negotiated or publicly advertised; use of the Authority's own forces; calling upon the Surety to complete the Work in accordance with the Contract; or a combination of any such methods; or

(3) Terminate the Contract and re-advertise as provided in law or if applicable, demand upon the Surety to complete any and all remaining work pursuant to the terms of the Contract and the Faithful Performance Bond.

As used herein, an "Event of Default" shall mean a material breach of the Contract by the Contractor which, without limitation, the following has occurred: (i) the Contractor has failed to begin the work in accordance with the Contract requirements; (ii) performance of this Contract has been unnecessarily or unreasonably delayed, (iii) the Contractor has willfully violated any of the provisions of the Contract or has not executed the same in good faith and in accordance with this Contract; (iv) the Contractor has abandoned the work; (v) the Contractor has become insolvent (other than as a bankrupt), or has assigned the proceeds of this Contract for the benefit of creditors, or taken advantage of any insolvency statute or debtor or creditor law or if his property or affairs have been put in the hands of a receiver; (vi) the Contractor has failed to obtain an approval required by the Contract; (vii) the Contractor has failed to provide the required insurances; (viii) the Contractor has failed to provide "adequate assurance" as required; or (ix) the Contractor is found to be non-responsible.

B. Any excess in the cost of completing the Contract beyond the price for which it was originally awarded shall be charged to and paid by the Contractor failing to perform the work or by the Contractor's Surety, pursuant to the terms and conditions of Section 40 of the New York State Highway Law and the Faithful Performance Bond.

C. Whenever the Authority determines to suspend, stop work, or terminate under this provision of the Contract, the Contractor and Surety shall receive written notice specifying the basis for such default (the "Default Notice"). Contractor shall have fifteen (15) days from the date of the Default Notice to cure such default, except that, at Authority's sole discretion, the Authority may extend such fifteen (15) day period for such additional period as the Authority shall deem appropriate without waiver of any of its rights hereunder. The Default Notice shall specify the date the Contractor is to discontinue all work if such default is not timely cured (the "Termination Date"). If the Event of Default is not cured or arrangements satisfactory to the Authority are not made (as evidenced in writing by the Authority) within the designated cure period, then Contractor shall suspend work and/or the Contract shall terminate~~,~~ as the case may be, upon the Termination Date.

D. Upon occurrence of an Event of Default or a termination for cause pursuant to this Article, the Authority has the remedies set forth in the Faithful Performance Bond, the Contract, and all remedies at law or in equity.

E. In the event the termination for cause is determined to be improper, the termination shall be deemed a Termination for Convenience as identified in Article 11.3.

Article 11.3 Termination for Convenience.

A. The Authority, at any time, may terminate the Contract in whole or in part. Any such termination shall be effected by delivering to the Contractor a written notice of termination specifying the extent to which performance of work under the Contract is terminated and the date upon which the termination becomes effective. Upon receipt of the notice of termination, the Contractor shall act promptly to minimize the expenses resulting from the termination.

B. The Authority shall pay the Contractor for work of the contract performed by the Contractor and accepted by the Authority for the period extending from the end of the period covered by the last approved Application for Payment up to the effective date of the termination, an amount determined in accordance with the Contract Documents. In no event shall the Contractor be entitled to compensation in excess of the total consideration of the Contract. In no event shall the Contractor be entitled to overhead or profit on the work not performed.

C. In the event of such termination, the Authority may take over the work and prosecute the Contract to completion and may take possession of and may utilize such materials, appliances, and equipment on the site and necessary or useful in completing the work. The Authority also has the right to suspend the execution of the Work for convenience and/or to terminate the Contract for convenience.

Whenever the New York State Thruway Authority determines to suspend or stop work under the contract, a written notice sent by mail to the Contractor at its address and to the sureties at their respective addresses, shall be sufficient notice of its action in the premises.

Article 11.4 Termination for Vendor Responsibility.

A. Contractor shall at all times during the Contract term remain responsible. Contractor agrees, if requested by the Authority, to present evidence of its continuing legal authority to do business in New York State, integrity, experience, ability, prior performance, and organizational and financial capacity.

B. The Authority, in its sole discretion, reserves the right to suspend any or all activities under this Contract, at any time, when it discovers information that calls in to question the responsibility of Contractor. In the event of such suspension, Contractor will be given written notice outlining the particulars of such suspension. Upon issuance of such notice, Contractor shall comply with the terms of the suspension order. Contract activity may resume at such time as the Authority issues a written notice authorizing a resumption of performance under the Contract.

C. Notwithstanding any other provision of this Contract, if the Authority determines Contractor to be non-responsible, the Authority shall have the right to terminate the Contract for cause pursuant to the terms of Article 11.2 - Termination for Cause herein.

In such event, the Authority shall have all rights and remedies set forth in Article 11.2, including, without limitation, the right to complete Contractor's contractual requirements in any manner the Authority may deem advisable and to pursueavailable legal or equitable remedies for the breach.

D. In no event shall termination of the Contract by the Authority for reasons of Contractor's non-responsibility be deemed a breach by the Authority, nor shall the Authority be liable for any damages or lost profits or otherwise that Contractor may incur as a result of such termination.

E. The Authority may require at any time the removal of a subcontractor to the Contractor that the Authority determines is not responsible.

ARTICLE 12. DETERMINATION AS TO VARIANCES.
In any case of any ambiguity in the plans, specifications or maps, or between any of them, the matter must be immediately submitted to the Chief Engineer, Department of Engineering, who shall adjust the same, and his/her decision in relation thereto shall be final and conclusive upon the parties.

ARTICLE 13. SUCCESSORS AND ASSIGNS.
This Agreement shall bind the successors, assigns and representatives of the parties hereto.

ARTICLE 14. INTERNATIONAL BOYCOTT PROHIBITION.
In accordance with Chapter 406 of the Laws of 1981, the Contractor hereby promises, asserts and represents that neither the Contractor nor any substantially owned or affiliated person, firm, partnership or corporation has participated, is participating or shall participate in an international boycott in violation of the provisions of the United States Export Administration Act of 1969, as amended, or the United States Export Administration Act of 1979, or the effective Regulations of the United States Department of Commerce promulgated under either act.

It is understood further that the Authority in awarding a contract does so in material reliance upon the promise and representation made by the Contractor in the foregoing paragraph and that such contract shall be rendered forfeit and void by the State Comptroller if subsequent to the bid execution date, the Contractor or such owned or affiliated person, firm, partnership or corporation has been convicted of a violation of the aforesaid Acts or Regulations or has been found upon final determination of the United States Commerce Department or any other appropriate agency of the United States to have violated such Acts or Regulations.

The Contractor agrees to and shall notify the Chief Engineer, Department of Engineering and the Director of the Office of Construction Management and the Director of State Expenditures in the Office of the State Comptroller of any such conviction or final determination of violation within five (5) days thereof.

ARTICLE 15. CERTIFICATION OF STATE FINANCE LAW SECTIONS 139-J AND 139-K.
By execution of this Agreement the Contractor certifies that all information provided with respect to New York State Finance Law Section 139-j and Section 139-k is complete, true and accurate. The Authority shall have a right to terminate this Agreement in the event the Authority finds that the certification made by the Contractor in accordance with New York State Finance Law Sections 139-j and 139-k was intentionally false or intentionally incomplete. This

includes the Authority's right to terminate this Agreement at any time in the event the Authority finds that Contractor is non-responsible or has failed to accurately disclose vendor responsibility information.

ARTICLE 16. WRITTEN NOTICES.

All notices permitted or required hereunder shall be in writing and transmitted by either:

a. certified or registered United States mail, return receipt requested;
b. facsimile transmission;
c. personal delivery;
d. expedited delivery service; or
e. e-mail.

Such notices shall be addressed to the individuals or titles named in the contract documents, or which are designated by the Contractor or the Authority at the pre-construction meeting, or which are designated by the Authority or the Contractor from time to time during the course of the Contract pursuant to the requirements herein.

Any such notice shall be deemed to have been given either at the time of personal delivery or, in the case of expedited delivery service or certified or registered United States mail, as of the date of first attempted delivery at the address and in the manner provided herein, or in the case of facsimile transmission or email, upon receipt.

The parties may, from time to time, specify a new or different address in the United States as their address for the purpose of receiving notice under this Agreement by giving fifteen (15) days written notice to the other party sent in accordance herewith. The parties agree to mutually designate individuals as their respective representatives for the purposes of receiving notices under this Agreement. Additional individuals may be designated in writing by the parties for purposes of implementation and administration/billing, resolving issues and problems and/or for dispute resolution.

ARTICLE 17. SUBCONTRACTING.

Contractor agrees not to subcontract any of its services without the prior written approval of the Authority.

Contractor retains ultimate responsibility for all services performed under the Agreement and shall pay any subcontractors promptly for work performed under this Agreement. Contractor shall be fully responsible to the Authority for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, just as Contractor is fully responsible to the Authority for the acts and omissions of persons directly employed by Contractor.

All subcontracts shall be in writing and shall contain provisions, which are functionally identical to, and consistent with, the provisions of this Agreement including, but not limited to, the body of this Agreement, Appendix A – Standard Clauses for New York State Thruway Authority Contracts, and the Contract Documents. Unless expressly waived in writing by the Authority, all subcontracts between the Contractor and its subcontractors shall expressly name the Authority, as the sole intended third party beneficiary of such subcontract. The Authority reserves the right to review and approve or reject any subcontract, as well as any amendment to said subcontract(s), and this right shall not make the Authority a party to any subcontract or create any right, claim, or interest in the subcontractor or proposed

subcontractor against the Authority. The Authority shall have the right to withdraw its consent to a subcontractor if, at the sole discretion of the Authority, it appears that the subcontract will delay, prevent, or otherwise impair Contractor's performance of services under this Agreement. Upon request, Contractor shall furnish to the Authority copies of all Contracts between Contractor and its subcontractors used to perform services for this Agreement.

The Authority reserves the right, at any time during the term of the Agreement, to verify that the written subcontract between Contractor and its subcontractors is in compliance with all of the provisions of this Article 17 and any subcontract provisions contained in this Agreement.

Contractor shall give the Authority immediate notice in writing of the initiation of any legal action or suit which relates in any way to a subcontract with a subcontractor or which may affect the performance of the Contractor's duties under the Agreement. Any subcontract shall not relieve the Contractor in any way of any responsibility, duty and/or obligation of the Agreement.

If at any time during performance under this Agreement total compensation to a subcontractor exceeds or is expected to exceed $100,000, said subcontractor shall be required to electronically submit and certify a new Vendor Responsibility Questionnaire directly to the Office of the New York State Comptroller, or submit and certify all necessary updated information thereof.

Nothing contained in this Agreement shall create any contractual relationship between a subcontractor and the Authority.

ARTICLE 18. CONFIDENTIALITY AND NON-DISCLOSURE.

A. "Confidential Information" means any information not generally known to the public, or that the Authority claims is confidential, whether oral, written, or electronic, that the Authority discloses, directly or indirectly, through any means of communication, to Contractor. Confidential Information includes, but is not limited to, operational and infrastructure information relating to: bid documents, plans, drawings, specifications, reports, product information and data; business and security processes and procedures; personnel and organizational data; financial statements; information system IP addresses, passwords, security controls, architectures and designs; and such other data, information and images that the Authority deems confidential.

B. Confidential Information does not include information which, at the time of the Authority's disclosure to Contractor: (1) is already in the public domain or becomes publicly known through no act of Contractor; or (2) is already known by Contractor free of any confidentiality obligations.

   If Contractor wants to disclose Confidential Information, it shall notify the Authority and specify the Confidential Information it wants to disclose. Contractor may only disclose such Confidential Information if the Authority approves such disclosure in writing, subject to such other terms and conditions as the Authority may require. Such approval, if given, shall only apply to the particular request and the specific Confidential Information for

which it is given.

If Contractor is required to disclose or make available, directly or indirectly, Confidential Information pursuant to statute, court or administrative order, subpoena, contractual obligation, or otherwise by law, Contractor shall: (1) notify the Authority that it has received such legal demand as soon as practicable, but in all events prior to any disclosure; (2) permit the Authority to take the steps it deems necessary and appropriate to protect the Confidential Information from disclosure; (3) cooperate to the fullest extent possible under the law with the Authority's efforts to protect the Confidential Information from disclosure; and (4) disclose only such Confidential Information, and only such portions thereof, as is required to satisfy the legal demand, and limit any such disclosure of Confidential Information to the fullest extent permissible under the law.

C. Contractor may use Confidential Information solely for the purposes of providing services to the Authority pursuant to this Agreement. Contractor may make copies of Confidential Information but only to the extent necessary for the disclosures and uses permitted by this Agreement. Contractor will make commercially reasonable efforts to ensure that any copy of Confidential Information that is made is marked to show that it is or contains Confidential Information. Contractor may share Confidential Information with third parties: (i) that are required for Contractor's provision of services to the Authority pursuant to this Agreement (e.g., Contractors and subcontractors); and (ii) that agree in writing to be bound by the confidentiality provisions of this Agreement; however, Contractor may share only that Confidential Information that is necessary to the third party's contribution to Contractor's provision of services to the Authority pursuant to this Agreement and Contractor must first obtain the Authority's prior written consent.

   The Authority's disclosure of Confidential Information to Contractor shall not convey to Contractor any right, title, or interest in or to such Confidential Information, and this Agreement does not transfer ownership of Confidential Information or grant a license thereto. The Authority shall retain all right, title, and interest in and to all such Confidential Information at all times.

D. Contractor shall hold Confidential Information confidential to the maximum extent permitted by law. Contractor shall safeguard Confidential Information with at least the same level of care and security that Contractor uses to maintain and protect from disclosure its own confidential information, using all reasonable and necessary security measures, devices, and procedures that Contractor uses to maintain its own confidential information, but in all events with not less than reasonable care.

   Contractor shall take reasonable steps to prevent unauthorized access to, use of, or disclosure of Confidential Information, including without limitation, by protecting its passwords and other log-in information. Contractor shall notify the Authority immediately of any known or suspected misuse or misappropriation of Confidential Information and shall use its best efforts to stop said misuse or misappropriation.

E. Upon written request of the Authority, or upon expiration or termination of this Agreement, Contractor shall return all Confidential Information to the Authority, or certify in writing that it has been destroyed and no copies exist.

F. Contractor agrees that breach of this Article 18 would cause the Authority irreparable

injury, for which monetary damages would not provide adequate compensation, and that in addition to any other remedy, the Authority will be entitled to injunctive relief against such breach or threatened breach, without proving actual damages or posting a bond or other security.

G. Without limiting the foregoing, the obligations and assurances involving Confidential Information pursuant to this Agreement shall survive termination or expiration of this Agreement.

ARTICLE 19. NEW YORK STATE HUMAN RIGHTS LAW, ARTICLE 15 OF THE EXECUTIVE LAW.

The New York State Human Rights Law, Article 15 of the Executive Law, prohibits discrimination (including to refuse to hire or employ or to bar or to discharge from employment an individual or to discriminate against such individual in compensation or in terms, conditions or privileges of employment) and harassment based on age, race, creed, color, national origin, sex, , sexual orientation, gender identity or expression, disability, marital status, familial status, domestic violence victim status, prior arrest or conviction record, military status or predisposing genetic characteristics, or because the individual has opposed any practices forbidden under the Human Rights Law or because the individual has filed a complaint, testified or assisted in any proceeding under the Human Rights Law, regardless of whether such harassment would be considered severe or pervasive under precedent applied to harassment claims. Harassment is an unlawful discriminatory practice when it subjects an individual to inferior terms, conditions or privileges of employment because of the individual's membership in one or more of these protected categories.

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 New York State Executive Order No. 177, by execution of this Agreement, Contractor 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 the aforementioned 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.

ARTICLE 20. DEBARMENT CERTIFICATION.

A. The Contractor certifies to the best of its knowledge and belief, that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

2. Have not within a three-year period preceding this contract been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

3. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (A)(2) of this certification; and

4. Have not within a three-year period preceding this application/proposal/contract had one or more public transactions (Federal, State or local) terminated for cause or default.

ARTICLE 21. CONFLICTS OF INTEREST.

A. Contractor has provided as Exhibit V (attached hereto and made a part of this Agreement), the Vendor Assurance of No Conflict of Interest or Detrimental Effect form, signed by an authorized executive or legal representative attesting that Contractor's performance of the services does not and will not create a conflict of interest with, nor position Contractor to breach any other contract currently in force with the Authority or the State of New York, that Contractor will not act in any manner that is detrimental to any Authority or State of New York project for which Contractor is rendering services.

B. Contractor hereby reaffirms the attestations made in its proposal and covenants and represents that there is and shall be no actual or potential conflict of interest that could prevent Contractor's satisfactory or ethical performance of duties required to be performed pursuant to the terms of this Agreement. Contractor hereby agrees it shall have a continuing affirmative duty and obligation to notify the Authority immediately of any actual or potential conflicts of interest.

C. In conjunction with any subcontract under this Agreement, Contractor shall obtain and deliver to the Authority, prior to entering into a subcontract, a Vendor Assurance of No Conflict of Interest or Detrimental Effect form, signed by an authorizedexecutive or legal representative of the subcontractor. Contractor shall also require in any subcontracting agreement that the subcontractor, in conjunction with any further subcontracting agreement, obtain and deliver to the Authority a signed and completed Vendor Assurance of No Conflict of Interest or Detrimental Effect form foreach of its subcontractors prior to entering into a subcontract.

D. The Authority and Contractor recognize that conflicts may occur in the future because

Contractor may have existing, or establish new, relationships. The Authority will review the nature of any relationships and reserves the right to terminate this Agreement for any reason, or for cause, if, in the judgment of the Authority, a real or potential conflict of interest cannot be cured.

ARTICLE 22. ETHICS.

Contractor and subcontractors may hire former State agency or Authority employees. However, as a general rule and in accordance with New York Public Officers Law, former employees of the Authority may neither appear nor practice before the Authority, nor receive compensation for services rendered on a matter before the Authority, for a period of two years following their separation from Authority service. In addition, former Authority employees are subject to a "lifetime bar" from appearing before the Authority or receiving compensation for services regarding any transaction in which they personally participated or which was under their active consideration during their tenure with the Authority.

During the term of the Agreement, Contractor and its subcontractors shall not engage any person who is, or has been at any time, in the employ of the Authority or New York State to perform services under the Agreement in violation of: the provisions of the Public Officers Law ("POL"); the rules, regulations, opinions, guidelines, or policies promulgated or issued by the New York State Joint Commission on Public Ethics ("JCOPE Regulations"); and any other laws applicable to the service of current or former Authority or New York State employees ("Other Laws," and, together with POL and JCOPE Regulations, collectively, the "Ethics Provisions"). Contractor certifies that all of its employees and employees of any subcontractor who are former employees of the Authority or New York State and who are assigned to perform services under the Agreement shall be assigned in accordance with all Ethics Provisions. Further, during the term of the Agreement, no person who is employed by Contractor or its subcontractors and who is disqualified from providing services under the Agreement pursuant to any Ethics Provisions may share in any net revenues Contractor or its subcontractors derives from the Agreement.

Contractor shall identify and provide the Authority with notice of those employees of Contractor or its subcontractors who are former employees of the Authority or New York State and who will be assigned to perform services under the Agreement, and shall ensure that such employees comply with all applicable laws and prohibitions. The Authority may, request that Contractor provide it with whatever information the Authority deems appropriate about each such person's engagement, work cooperatively with the Authority to solicit advice from the New York State Joint Commission on Public Ethics, and, if deemed appropriate by the Authority, instruct any such person to seek the opinion of the Joint Commission on Public Ethics. The Authority shall have the right to withdraw or withhold approval of any subcontractor if utilizing such subcontractor for any work performed hereunder would be in conflict with any of the Ethics Requirements. The Authority shall have the right to cancel or terminate the Agreement at any time if any work performed underthe Agreement is in conflict with any Ethics Provisions.

ARTICLE 23. MINORITY AND WOMEN BUSINESS ENTERPRISE GOALS AND SERVICE DISABLED VETERANS OWNED BUSINESS GOALS.

This Contract is subject to State provisions (including State Executive Law 15-A and 5 NYCRR Parts 140-145) concerning the utilization of Minority-Owned Business Enterprises (MBE) and Women-Owned Business Enterprises (WBE) (collectively M/WBE). All State M/WBE requirements are applicable to this Contract. The approved overall combined MBE and WBE participation goal for the project is established in the Contract Documents.

This Contract is subject to State provisions (including State Executive Law 15-A and 5 NYCRR Parts 140-145) concerning the utilization of Service Disabled Veterans Owned Business (SDVOB). All State SDVOB requirements are applicable to this Contract. The approved overall SDVOB participation goal for the project is established in the Contract Documents.

ARTICLE 24. IRAN DIVESTMENT ACT- SECTION 2879-C OF THE PUBLIC AUTHORITIES LAW.

A. As used in this Article 24, "person" has the meaning set forth in paragraph (e) of subdivision 1 of Section 165-a of the State Finance Law.

B. As used in this Article 24 "Contract" means this Agreement.

C. Contractor hereby provides the following certification: By signing this Contract, each person and each person signing on behalf of any other party certifies, and in the case of a joint bid 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.

ARTICLE 25. COVENANT AGAINST CONTINGENT FEES.

Contractor warrants that it has not employed or retained any company or person, other than a bona fide employee working for Contractor, to solicit or secure this Agreement, and has not paid or agreed to pay any company or person, other than a bona fide employee, any fee, commission, percentage, brokerage fee, gift, or any other consideration, contingent upon or resulting from the award or making of this Agreement. In the event Contractor violates this warranty, Authority shall have the right to terminate this Agreement without liability, or, in its discretion, to deduct from payments otherwise owed to the Contractor for services provided pursuant to this Agreement the full amount of such fee, commission, percentage, brokerage fee, gift or other consideration.

ARTICLE 26. COMPLIANCE MONITORING.

In the event that the Contractor, its affiliates or any subcontractor is or becomes subject to a compliance monitoring requirement consequent to an agreement with a governmental entity at any time prior to completion of the contract, the Contractor shall promptly notify the Authority of the same. Compliance monitoring means any requirement imposed by a governmental entity arising from an investigation of activities of the Contractor, its affiliates, or any subcontractor concerning alleged compliance violations, pursuant to which the subject entity is obligated to allow an independent third party to review, analyze, investigate or report on that entity's future compliance with governmental rules and/or contractual requirements arising from governmental rules. Said notice shall be in writing and shall include (i) a copy of the order, settlement or other document setting forth the requirement to implement a monitoring program and (ii) the specific requirements and conditions of the required program. If the order, settlement or other document is subject to confidentiality protection that cannot be unilaterally waived by the Contractor or the entity that is subject to the requirement, the Contractor shall cause the subject entity to confirm that it is subject to a compliance monitoring requirement

and to provide a confidential summary of the terms and conditions of the monitoring requirement to the Contractor, with a copy to the Authority.

The Contractor shall further cause the subject entity to promptly notify the Contractor, with a copy to the Authority, of any violations of the monitoring program by the subject entity and of any other concerns expressed by the monitor regarding compliance with the monitoring program requirements. In such event, the Contractor shall provide to the Authority a detailed written report as to whether and to what extent, if any, the violation or concerns expressed by the monitor are relevant to the Contractor's compliance with its Contract obligations, or to the performance of work by the Contractor. The Authority shall at all times have the right to independently investigate whether any matter raised by the monitor will have any effect upon the Contractor's compliance with its Contract obligations or performance of work by the Contractor and/or subject entity. If any such violation occurs or concerns expressed by the monitor involve compliance requirements that are deemed by the Authority to be relevant to the Contract, the Authority shall have the right to require the Contractor to institute, at Contractor expense, additional data keeping, reporting, and/or other safeguard measures, including permitting independent auditing and access to pertinent records of the Contractor or the subject entity to mitigate risk that a similar violation will occur on the project or be a cause for concern with respect to the Contractor's performance of its obligations under the Contract. The Authority's audit rights under the Contract shall include the right to audit and access pertinent records of the Contractor or the subject entity relating to compliance issues described herein.

The Authority agrees to take all reasonable measures to maintain the confidentiality (to the extent permitted by law) of any information provided by Contractor and/or the subject entity pursuant to this Article 26 which the Contractor has reasonably designated as confidential, and the provisions of Appendix A, Section 9 of the New York State Thruway Authority Addendum to the Standard Specifications, of the Agreement shall apply with respect to disclosure of any such Records under the Statute (as defined in such section). Any intra-agency written materials prepared by the Authority, or any written inter-agency materials that are in the possession or control of the Authority, to the extent based on information or records designated as confidential or exempt from disclosure under the Statute as provided in the preceding sentence, shall also be designated and treated as such by the Authority to the fullest extent permitted by law. The Authority may disclose any of the aforementioned information, records and materials to the New York State Department of Transportation, provided that the Department agrees to treat such information, records and material in the same manner as required of the Authority under this paragraph.

The rights and remedies granted to the Authority under this Article 26 are in addition to, and not to the exclusion of, any and all of its rights and remedies under the Contract or at law or in equity.

ARTICLE 27. INDEMNIFICATION.

The Contractor shall be responsible for all damage to life and property due to negligent or otherwise tortious acts, errors or omissions of the Contractor in connection with its services under the Contract Documents. To the fullest extent permitted by law: (a) the Contractor shall indemnify, hold harmless, and release the Authority, the State of New York, any municipality in which the Work is being performed; and/or any public benefit corporation, railroad or public utility whose property or facilities are affected by the Work from suits, claims, actions, damages, and costs of every name and description resulting from the Work under this Contract and until the Final Acceptance thereof; (b) with respect to personal injury or property damage occurring after Final Acceptance and not covered by the indemnity in clause Article 27 (a), the Contractor shall indemnify, hold harmless, and release the Authority, the State of New York, any municipality in which the Work is being performed;

and/or any public benefit corporation, railroad or public utility from suits, claims, actions, damages, and costs of every name and description resulting from negligent or otherwise tortious acts, errors or omissions of the Contractor in connection with its services under the Contract Documents; and (c) the Contractor shall indemnify, hold harmless, and release the Authority's Inspector from suits, claims, actions, damages, and costs involving personal injury and property damage resulting from the Contractor's Work under the Contract during its prosecution and until the Final Acceptance thereof. The Authority may retain such monies from the amount due the Contractor as may be necessary to satisfy any claim for damages recovered against the Authority, the State of New York. any municipality in which the Work is being performed, any public benefit corporation, railroad, or public utility whose property or facilities are affected by the Work, or the Authority's Inspectors. The Contractor's obligation under this paragraph shall not be deemed waived by the failure of the Authority to retain the whole or any part of such monies due the Contractor, or where such suit, action, damages, and/or costs have not been resolved or determined prior to release of any monies to the Contractor under the Contract. Such obligation shall not be deemed limited or discharged by the enumeration or procurement of any insurance for liability for damages imposed by law upon the Contractor, Subcontractors, the Authority, the State, any municipality in which the Work is being performed, any public benefit corporation, railroad, or public utility whose property or facilities are affected by the Work, or any Department consultants or contractors working relative to the Project.

The Contractor has the obligation, at its own expense, for the defense of any action or proceeding which may be brought against the parties specified in this Article. This obligation shall include the cost of attorney fees, disbursements, costs, and other expenses incurred in connection with such action or proceeding. The provisions of this Article shall survive the expiration or termination of the Contract.

Without limiting the generality of the foregoing, Contractor's obligation to indemnify, save harmless and release the Persons identified in this article specifically includes any suits, claims, actions, damages, and costs of every name and description resulting from any spill or release or threatened spill or release of a Hazardous Material (i) attributable to the negligence, willful misconduct or breach of contract by Contractor, its Subcontractors or agents, or (ii) which was brought onto the Site by Contractor or any of its Subcontractors or agents.

Notwithstanding the foregoing, the Authority reserves the right to join such action, at its sole expense, when it determines there is an issue involving a significant public interest. Such obligation does not extend to those suits, actions, damages, and costs of every name which arise out of the sole negligence of the Authority, the State of New York, any municipality in which the Work is being performed, any public benefit corporation, railroad, or public utility whose property or facilities are affected by the Work of the Project, or any Authority consultants or Contractors working relative to the Project, their agents, or their employees.

ARTICLE 28. NOTICES REGARDING CLAIMS, LITIGATION AND RULINGS.

The Contractor shall promptly provide written notice to the Authority of all claims, litigation and governmental rulings pertaining to the work where such claims, litigation or rulings could subject the Authority to liability or substantially impair the completion of the Contract work. With such notice, the Contractor shall include a brief summary of the issue involved and the Contractor's position on such issue. Such written notice is additional to and not in place of any other notices required by the Contract Documents. The Contractor shall cooperate and provide, and shall require all subcontractors to cooperate and provide, such information or

records as may be reasonably requested by the Authority concerning such claims, litigation or rulings.

ARTICLE 29. COOPERATION AND FURTHER ASSURANCES.

Contractor shall cooperate and provide, and shall cause all subcontractors to cooperate and provide, such information as is necessary or requested by the Authority to assist or facilitate the submission by the Authority of any documentation, reports or analysis required by the State, and/or any other governmental entity with jurisdiction over the work. The Contractor shall promptly execute and deliver to the Authority all such instruments and other documents and assurances as are reasonably requested by the Authority to further evidence the obligations of the Contractor under the Contract.

ARTICLE 30. SEVERABILITY.

If any clause, provision, section, article or part of any of the Contract Documents is ruled invalid by a court having proper jurisdiction, the invalidity or unenforceability of any such clause, provision, section, article or part shall not affect the validity or enforceability of the balance of the Contract Documents, which shall be construed and enforced as if the Contract Documents did not contain such invalid or unenforceable clause, provision,section, article or part.

ARTICLE 31. ENVIRONMENTAL REVIEW

Article 31.1 Lead Agency

The Authority reserves the right to be “lead agency” for any compliance with the New York State Environmental Quality Review Act (SEQRA), and the appropriate federal agency shall serve as “lead agency” for the National Environmental Policy Act (NEPA), as may be required for this Agreement or any activity undertaken by Contractor pursuant to this Agreement.

Article 31.2 Executive Order 22

Embodied Carbon Disclosure: For building materials covered by the GreenNY Council Embodied Carbon Guidance, Contractors and designers shall disclose, at regular intervals during the course of the contract period (and no less than once a year), the exact materials/product type and estimated quantities used. For materials for which Environmental Product Declarations (EPDs) exist that comply with the GreenNY Council requirements, Contractors are also required to submit kgCO2 equivalent estimates by material/product, and quantity used, on the project to date, with a .pdf copy of the EPD or a link to the digital EPD. (Please see the EO22 Special Note contained in the Special Notes section of this proposal).

Contract Number:

In addition to the acceptance of this contract, I also certify that original copies of this signature page will be attached to all other exact copies of this contract.

IN-WITNESS WHEREOF, the parties hereto have executed this agreement on the day and year first above written.

NEW YORK STATE
THRUWAY AUTHORITY

By _____
Chief Engineer

Date _____

_____
Contractor

NEW YORK STATE
THRUWAY AUTHORITY
Recommended as to Availability of Funds:

By _____
Chief Financial Officer

Date _____

(ACKNOWLEDGMENT BY INDIVIDUAL CONTRACTOR)

STATE OF NEW YORK

COUNTY OF _____ ss.:

On this _____ day of _____, 202_, before me personally came _____ to me known and known to me to be the person described in and who executed the foregoing instrument, and acknowledged that he executed the same.

_____
Notary Public

(ACKNOWLEDGMENT BY CO-PARTNERSHIP CONTRACTOR)

STATE OF NEW YORK

COUNTY OF _____ ss.:

On this _____ day of _____, 202 before me personally came and appeared _____ to me known and known to me to be the person who executed the above instrument, who, being sworn by me, did for himself depose and say that he is a member of the firm of _____ consisting of himself and _____ and that he executed the foregoing instrument in the firm name of _____ and that he had authority to sign same, and he did duly acknowledge to me that he executed the same as the act and deed of said firm of _____, for the uses and purposes mentioned therein.

_____
Notary Public

(ACKNOWLEDGEMENT OF A CORPORATION)

STATE OF NEW YORK }
}
COUNTY OF }

On this_____day of_____, 202_, before me personally came_____, to me known and known to me to be the person who executed the above instrument, who being duly sworn by me, did depose and say that he/she resides in _____, that he/she is the _____ of_____, the corporation described in and which executed the above instrument, and that he/she signed his/her name thereto on behalf of said Corporation by order of the Board of Directors of said Corporation.

_____
Notary Public

Exhibit V

Vendor Assurance of No Conflict of Interest or Detrimental Effect

The undersigned entity ("Contractor"), offering to provide services pursuant to this Agreement, as a contractor, joint venture contractor, subcontractor, or consultant, attests that its performance of the services outlined in this Agreement does not and will not create a conflict of interest with nor position the Contractor to breach any other contract currently in force with the New York State Thruway Authority ("Authority").

Furthermore, the Contractor attests that it will not act in any manner that is detrimental to any Authority project on which the Contractor is rendering services. Specifically, the Contractor attests and certifies that:

1. The fulfillment of obligations by the Contractor does not violate any existing contracts or agreements between the Contractor and the Authority;

2. The fulfillment of obligations by the Contractor does not and will not create any conflict of interest, or perception thereof, with any current role or responsibility that the Contractor has with regard to any existing contracts or agreements between the Contractor and the Authority;

3. The fulfillment of obligations by the Contractor does not and will not compromise the Contractor's ability to carry out its obligations under any existing contracts between the Contractor and the Authority;

4. The fulfillment of any other contractual obligations that the Contractor has with the Authority will not affect or influence its ability to perform under the Agreement;

5. During the negotiation and execution of any contract, the Contractor will not knowingly take any action or make any decision which creates a potential for conflict of interest or might cause a detrimental impact to the Authority as a whole including, but not limited to, any action or decision to divert resources from one Authority project to another;

6. In fulfilling obligations under each of its Authority contracts, including this Agreement, the Contractor will act in accordance with the terms of each of its Authority contracts and will not knowingly take any action or make any decision which might cause a detrimental impact to the Authority as a whole including, but not limited to, any action or decision to divert resources from one Authority project to another;

7. No former officer or employee of the Authority or State of New York ("State") who is now employed by the Contractor, nor any former officer or employee of the Contractor who is now employed by the Authority or State, has played a role with regard to the administration of this contract procurement in a manner that may violate section 73(8)(a) of the New York State Public Officers Law; and

8. The Contractor has not and shall not offer to any employee, member or director of the Authority any gift, whether in the form of money, service, loan, travel, entertainment, hospitality, thing or promise, or in any other form, under circumstances in which it could reasonably be inferred that the gift was intended to influence said employee, member or director, or could reasonably be expected to influence said employee, member or director, in the performance of the official duty of said

employee, member or director or was intended as a reward for any official action on the part of said employee, member or director.

Contractor agrees that the Authority recognizes that conflicts may occur in the future because a Contractor may have existing or new relationships. The Authority will review the nature of any such new relationship and reserves the right to terminate the contract for cause if, in its judgment, a real or potential conflict of interest cannot be cured.

This form must be signed by an authorized executive or legal representative.

_____
Contractor Name

_____
Name of Signatory

_____
Title of Signatory

_____
Signature:

_____
Date:

CONTRACT:

COUNTY:

FAITHFUL PERFORMANCE BOND

BOND

Know all men by these presents, that we (hereinafter called the "Principal")

and _____

of _____ (hereinafter called the "Surety") are held and firmly bound unto the New York State Thruway Authority, (hereinafter called the "Authority"), in the full and just sum of good and lawful money of the United States of America for the payment of which said sum of money, well and truly to be made and done, the said Principal binds himself, his heirs, executors, administrators or assignees and the said SURETY binds itself, its successors or assigns, jointly and severally, firmly by these presents.

Signed, sealed and dated this _____ of _____, 202_____,

Whereas, said Principal has entered into a certain written contract bearing date of the _____ day of _____, 202 with the Authority for:

Now, therefore, THE CONDITION OF THIS OBLIGATION IS SUCH that if the said Principal shall well, truly and faithfully perform the work in accordance with the terms of the contract, and with the plans and specifications, and will commence and complete the work within the time prescribed in the contract, on his part to be kept and performed according to the terms and tenor of said contract, and shall protect the said N.Y.S. Thruway Authority against, and pay any excess of cost as provided in said contract, and all amounts, damages, costs and judgments which may be recovered against said N.Y.S. Thruway Authority, N.Y.S. Dept. of Transportation the Commissioner of Transportation and the State of N.Y. or its or any of their officers or agents or which the said aforementioned may be called upon to pay to any person or corporation by reason of any damages, direct or indirect, arising or growing out of the doing of said work, or from the negligence, non-feasance, misfeasance, or malfeasance of any officer, agent or employee of the aforementioned, or suffered or claimed on account of aforesaid work during the time thereof and until the final completion and acceptance of the work, or the manner of doing the same, or the neglect of the said Principal, or his agents, or servants, or the improper performance of the said work by the said Principal, or his agents, or servants, or from any other cause, then this obligation shall be null and void, otherwise to remain in full force and virtue.

In the event of a failure of performance of the contract by the Principal, which shall include, but not be limited to, any breach or default of the contract by the Principal, or in case said contract is forfeited by the Principal in the manner provided for in the contract and the said Surety, for value received, hereby stipulates and agrees, if requested to do so by the Authority, has the option to either remedy the default, or breach or forfeiture of the Principal or take charge and fully perform and complete the work, mentioned and described in said contract and specifications, pursuant to the terms, conditions and covenants thereof and as may be amended, at its own expense. The procedure by which the surety undertakes to discharge its obligations under the bond shall be subject to the advance written approval of the Authority. If the Surety completes the contract, it shall be paid for the actual items of work performed in accordance with the Principal's contract terms and prices. In the event the Surety assumes the rights and obligations of the Principal.

It shall be the duty of the Surety to give unequivocal notice in writing to the Authority, within forty-five (45) days after receipt of written notice from the Authority to the Surety, of the Surety's election to remedy default(s) or breach(es) or forfeiture(s) promptly or to perform and fully complete the contract promptly as provided herein, time being of the essence of this bond. In said notice of election, the Surety shall state the date on which the remedy or performance shall commence. During the period between the Authority's notice and Surety's performance of the contract or remedy of the default, breach or forfeiture, the Surety shall be liable for and agrees to pay any and all reasonable and necessary costs as determined by the Authority to maintain the project site safe and convenient to the public.

It shall also be the duty of the Surety to give prompt notice in writing to the Authority upon completion of the remedy and/or correction of each breach or default or completion of the contract. The surety shall not assert solvency of its Principal or its Principal's denial of default as justification for its failure to give notice of election or for its failure to promptly remedy the breach or default or to complete the contract.

In the event the Surety shall fail to exercise either option or to act promptly then the Authority shall give ten (10) days notice of such failure, both to the Principal and the Surety, and after the expiration of the 10 days the Authority may cause the work to be completed in accordance with the contract, and the Surety and the Principal shall be jointly and severally liable for the amount of the excess cost of completing the contract work beyond the amounts remaining for this contract adjusted for the work actually performed. When the cost of completion of performance by the Obligee is estimated, the Principal and Surety shall pay, free from all liens and encumbrances, the Authority determined estimated completion costs above funds remaining for this contract, to the Authority within 30 days of receipt of the estimate. Adjustment to the Authority's estimated completion cost will be made upon the Authority's final acceptance of the work and appropriate refunds, if any, will be promptly made to the Surety. Any actual costs in excess of the estimated price shall be paid to the Authority promptly on demand. Additionally, Principal and Surety shall be liable for any applicable liquidated and/or engineering costs or damages.

In addition, the said Principal and Surety further agree, as part of this obligation, to pay all damages of any kind to person or property that may result from a failure in any respect to perform and complete said contract including, but not limited to costs necessary to protect the traveling public or to avoid inconvenience to the traveling public, (liquidated damages as provided above) all repair and replacement costs necessary to rectify construction errors, architectural and engineering costs and fees, all Contractor fees, all testing and laboratory fees, and all interest, legal fees and litigation costs incurred by the Authority.

And the said Surety hereby stipulates and agrees that no change, extension, alteration, deduction of addition in or to the terms of the said contract or the plans or specification accompanying the same shall in any wise affect the obligation of said Surety on its bond.

Contractor Name _____ L.S.

(Corporate seal of _____ L.S. Principal

principal if a corporation.) _____ L.S.

(Corporate seal of _____ L.S.
surety.)

_____ L.S. Surety

STATE OF NEW YORK
OFFICE OF THE ATTORNEY GENERAL

I hereby approve the foregoing contract and bond as to form and manner of execution.

Dated _____ _____
Attorney General

(ACKNOWLEDGMENT BY PRINCIPAL, UNLESS IT BE A CORPORATION)

STATE OF NEW YORK,

COUNTY OF_____ ss.:

On this_____day of_____, 202_, before me personally came_____to me known, to be the person described in and who executed the foregoing instrument and he acknowledged that he executed the same.

_____
Notary Public

(Notary's seal to be attached.)

_____

(ACKNOWLEDGMENT BY PRINCIPAL, IF A CORPORATION)

STATE OF NEW YORK,

COUNTY OF_____ ss.:

On this_____day of_____, 202__, before me personally came_____to me known, who being by me duly sworn, did depose and say that he resides in_____, that he is the_____of _____, the corporation described in and which executed the foregoing instrument: that he knew the seal of the said corporation: that the seal affixed to said instrument was such corporate seal: that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

_____
Notary Public

(ACKNOWLEDGED BY SURETY COMPANY)

STATE OF NEW YORK,

COUNTY OF_____ ss.:

On this_____day of_____, 202_, before me personally came_____to me known, who being by me duly sworn, did depose and say that he resides in_____, that he is the_____of _____, the corporation described in and which executed the foregoing instrument: that he knew the seal of the said corporation: that the seal affixed to said instrument was such corporate seal: that it was so affixed by order of the Board of Directors of said corporation,and that he signed his name thereto by like order.

_____
Notary Public

(Notary's seal to be attached.)

(The Surety Company must append statement of its financial condition and a copy of the resolution authorizing the execution of Bonds by officers of the Company.)

NEW YORK STATE THRUWAY AUTHORITY

LABOR AND MATERIAL BOND

Know all men by these presents,

That, _____
(Name of Principal)

of _____

(hereinafter called the Principal, and _____
(Name of Surety Company)
a corporation of the State of_____, authorized to do business in the State of New York, as Surety and whose principal office is located in the City of_____, State of _____ (hereinafter called the Surety), are held and firmly bound unto the NEW YORK STATE THRUWAY AUTHORITY, (hereinafter called the Authority), in the full and just sum of _____ good and lawful money of the United States of America, for the payment of which said sum of money, well and truly to be made and done, the said Principal and Surety bind themselves, their and each of their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

Whereas, said Principal has entered into a certain written contract, with the Authority bearing date _____ _____ day of_____202_, with the New York State Thruway Authority for:

Which contract is hereby referred to and made a part here of as fully and to the same extent as if copied at length herein.

Now therefore, the condition of this obligation is such that if the said Principal shall promptly pay all moneys due to all persons furnishing labor and materials to him or his subcontractors in the prosecution of work provided for in said contract. Then this obligation shall be void, otherwise to remain in full force and effect;

Provided, however, that the Comptroller of the State of New York having required the said Principal to furnish this bond in order to comply with the provisions of Section 137 of the State Finance Law, all rights and remedies on this bond shall inure solely to such persons and shall be determined in accordance with the provisions, conditions and limitations of said Section to the same extent as if they were copied at length herein; and

Further, provided, that the place of trial of any action on this bond shall be in the county in which the said contract was to be performed, or if said contract was to be performed in more than one county, then in any such county, and not elsewhere.

SIGNED, SEALED AND DELIVERED THIS_____day of_____, 202__

(Principal(s) Sign Here)
(Affix Corporate Seal If a Corporation)

(Surety Signs Here)
(Affix Corporate Seal of Surety Co.)

_____ _____

_____ _____

FOR PRINCIPAL'S USE ONLY (Use Only One)

(The Surety Company must append statement of its financial condition and a copy of the resolution authorizing the execution of Bonds by officers of the Company.)

(INDIVIDUAL ACKNOWLEDGMENT)
UNLESS A CORPORATION

STATE OF _____

COUNTY OF_____ss.:

On this_____day of_____, 202_, before me personally came _____to me known and known to me to be the person mentioned and described in and who executed in foregoing instrument and he duly acknowledged to me that he executed the same.

_____
Notary Public

_____

(ACKNOWLEDGEMENT OF A CORPORATION)

STATE OF NEW YORK }
}
COUNTY OF }

On this_____day of_____**,** 202_**,** before me personally came _____**,** to me known and known to me to be the person who executed the above instrument, who being duly sworn by me, did depose and say that he/she resides in_____, that he/she is the_____of_____, the corporation described in and which executed the above instrument, and that he/she signed his/her name thereto on behalf of said Corporation by order of the Board of Directors of said Corporation.

_____
Notary Public

_____

FOR SURETY'S USE ONLY

(SURETY ACKNOWLEDGMENT)

STATE OF _____

COUNTY OF_____ss.:

On this_____day of_____, 202_, before me personally came _____that he is the_____of the _____ the corporation described in and which executed the above instruments; that he knows the seal of said corporation, that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of Said corporation, and that he signed his name thereto by like order.

_____
Notary Public

TAP-326 (11/2023)

APPENDIX A

Standard Clauses For New York State Thruway Authority Contracts

The parties to the attached contract, license, lease, amendment or other agreement of any kind ("the contract" or "this contract") agree to be bound by the following clauses which are hereby made a part of the contract (the word "Contractor" herein refers to any party and its agents, successors and assigns, other than the Thruway Authority ("Authority"), whether a contractor, licensor, licensee, lessor, lessee or any other party):

1. **NON-ASSIGNMENT CLAUSE**. This contract may not be assigned by the Contractor nor may its right, title or interest therein be assigned, transferred, conveyed, subcontracted, sublet or otherwise disposed of without the previous consent, in writing, of the Authority and any attempts to assign the contract without the Authority's written consent are null and void.

2. **COMPTROLLER APPROVAL**. Where required by law, this contract may require approval of the State Comptroller and shall not be valid until it has been approved by the State Comptroller and filed in its office.

3. **WORKERS' COMPENSATION AND DISABILITY BENEFITS**. This contract shall be void and of no force and effect unless the Contractor shall provide and maintain coverage during the life of this contract for the benefit of such employees as are required to be covered by the provisions of the State Workers' Compensation Law. If employees will be working on, near or over navigable waters, a U.S. Longshore and Harbor Workers' Compensation Act endorsement must be included.

4. **NON-DISCRIMINATION REQUIREMENTS**. To the extent required by Article 15 of the State 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 (including gender identity or expression), national origin, sexual orientation, military status, age, disability, predisposing genetic characteristics, marital status or domestic violence victim status or because the individual has opposed any practices forbidden under the Human Rights Law or has filed a complaint, testified, or assisted in any proceeding under the Human Rights Law. Furthermore, in accordance with State Labor Law §220-e, if 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; or (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 State Labor Law §230, then, in accordance with §239 thereof, the 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; or (b) discriminate against or intimidate any employee hired for the performance of work under this contract. The Contractor is subject to fines of $50 per person per day for any violation of State Labor Law §§220-e or 239 as well as possible termination of this contract and forfeiture of all moneys due hereunder for a second or subsequent violation.

5. **WAGE AND HOURS PROVISIONS**. If this is a public work contract covered by Article 8 of the State Labor Law or a building service contract covered by Article 9 thereof, neither the Contractor's employees nor the employees of its subcontractors may be required or permitted to work more than the number of hours or days stated in said statutes, except as otherwise provided in the State Labor Law and as set forth in prevailing wage and supplement schedules issued by the State Labor Department. Furthermore, the Contractor and its subcontractors must pay at least the prevailing wage rate and pay or provide the prevailing supplements, including the premium rates for overtime pay, as determined by the State Labor Department in accordance with the State Labor Law. Additionally, effective April 28, 2008, if this is a public work contract covered by Article 8 of the New York State Labor Law, the Contractor understands and agrees that the filing of payrolls in a manner consistent with subdivision 3-a of §220 of the New York State Labor Law shall be a condition precedent to payment by the Authority of any Authority approved sums due and owing for work done on the project.

6. **NON-COLLUSIVE BIDDING CERTIFICATION**. In accordance with State Public Authorities Law §2878, if this contract was awarded based upon the submission of bids, the Contractor warrants, under penalty of perjury, that its bid was arrived at independently and without collusion aimed at restricting competition. The Contractor further warrants that, at the time the Contractor submitted its bid, an authorized and responsible person executed and delivered to the Authority a non-collusive bidding certification on the Contractor's behalf.

7. **INTERNATIONAL BOYCOTT PROHIBITION**. In accordance with State Labor Law §220-f, if this contract exceeds $5,000, the Contractor agrees, as a material condition of this contract, that neither the Contractor nor any substantially owned or affiliated person, firm, partnership, or corporation has participated, is participating, or shall

participate in an international boycott in violation of the Federal Export Administration Act of 1979 (50 USC App. §§2401 et seq.) or regulations thereunder. If such Contractor, or any of the aforesaid affiliates of the Contractor, is convicted or is otherwise found to have violated said laws or regulations upon the final determination of the United States Commerce Department or any other appropriate agency of the United States subsequent to the contract's execution, such contract, amendment or modification thereto shall be rendered forfeit and void. The Contractor shall so notify the Authority within five (5) business days of such conviction, determination or disposition of appeal.

8. **SET-OFF RIGHTS**. The Authority shall have rights of set-off. These rights shall include, but not be limited to, the Authority's option to withhold for the purposes of set-off any moneys due to the Contractor under this contract up to any amounts due and owing by the Contractor to the Authority with regard to this contract, or any other contract with the Authority, including any contract for a term commencing prior to the term of this contract, plus any amounts due and owing to the Authority for any other reason including, without limitation, monetary penalties, adjustments, fees, or claims for damages by the Authority and third parties in connection therewith.

9. **RECORDS**. The Contractor shall establish and maintain complete and accurate books, records, documents, accounts and other evidence directly pertinent to performance under this contract (collectively, "Records") for a period of six (6) years (or any other longer period required by law) following final payment or the termination of this contract, whichever is later, and any extensions thereto. The Authority, State Comptroller, State Attorney General and any other person or entity authorized to conduct an examination shall have access to the Records during normal business hours at an office of the Contractor within New York State, or, if no such office is available, at a mutually agreeable and reasonable venue within the State, during the contract term, any extensions thereof and said six (6) year period thereafter, for purposes of inspection, auditing and copying. As used in this clause, "termination of this contract" shall mean the later of completion of the work of the contract or the end date of the term stated in the contract. The Authority will take reasonable steps to protect from public disclosure those Records which are exempt from disclosure under State Public Officers Law §87 ("Statute") provided that: (i) the Contractor shall timely inform an appropriate Authority official, in writing, that said records should not be disclosed; (ii) said records shall be sufficiently identified; and (iii) designation of said records as exempt under the Statute is reasonable. Nothing contained herein shall diminish, or in any way adversely affect, the Authority's right to discovery in any pending or future litigation.

10. **IDENTIFYING INFORMATION AND PRIVACY NOTIFICATION**. All invoices or New York State standard vouchers submitted for payment for the sale of goods or services or the lease of real or personal property to the Authority must include the payee's identification number, i.e., the seller's or lessor's identification number. The number is either the payee's Federal employer identification number or Federal social security number, or both such numbers when the payee has both such numbers. Failure to include this number or numbers may delay payment. Where the payee does not have such number or numbers, the payee, on its invoice or New York State standard voucher, must give the reason or reasons why the payee does not have such number or numbers.

The authority to request the above personal information from a seller of goods or services or a lessor of real or personal property, and the authority to maintain such information, is found in State Tax Law §5. Disclosure of this information by the seller or lessor to the Authority is mandatory. The principal purpose for which the information is collected is to enable the State to identify individuals, businesses and others who have been delinquent in filing tax returns or may have understated their tax liabilities and to generally identify persons affected by the taxes administered by the State Commissioner of Taxation and Finance. The information will be used for tax administration purposes and for any other purpose authorized by law.

The above personal information is maintained at the New York State Thruway Authority, Department of Finance and Accounts, P.O. Box 189, Albany, New York 12201.

11. **EQUAL EMPLOYMENT OPPORTUNITIES FOR MINORITIES AND WOMEN**. In accordance with State Executive Law §312, if this contract is: (i) a written agreement or purchase order instrument, providing for a total expenditure in excess of $25,000, whereby the Authority is committed to expend or does expend funds in return for labor, services, supplies, equipment, materials or any combination of the foregoing, to be performed for, or rendered or furnished to the Authority; or (ii) a written agreement in excess of $100,000 whereby the Authority is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, major repair or renovation of real property and improvements thereon; or (iii) a written agreement in excess of $100,000 whereby the owner of a State assisted housing project is committed to expend or does expend funds for the acquisition, construction, demolition, replacement, or major repair or renovation of real property and improvements thereon for such project, then the following shall apply and by signing this contract the Contractor certifies and affirms that it is Contractor's equal employment opportunity policy that:

(a) The Contractor will not discriminate against employees or applicants for employment because of race, creed, color, national origin, sex, age, disability, or marital status, and shall make and document its conscientious and active efforts to employ and utilize minority group members and women in its work force on Authority contracts and will undertake or continue existing programs of affirmative action to ensure that minority group members and women are afforded equal

employment opportunities without discrimination. As used in this clause, "affirmative action" shall mean recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, lay-off or termination, and rates of pay or other forms of compensation.

(b) At the request of the Authority, the Contractor shall request each employment agency, labor union, or authorized representative of workers with which it has a collective bargaining or other agreement or understanding, to furnish a written statement that such employment agency, labor union or representative will not discriminate on the basis of race, creed, color, national origin, sex, age, disability or marital status, and that such union or representative will affirmatively cooperate in the implementation of the Contractor's obligations herein.

(c) The Contractor shall state, in all solicitations or advertisements for employees, that in the performance of this contract all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, national origin, sex, age, disability or marital status.

The Contractor shall include the provisions of (a), (b) and (c) above in every subcontract over $25,000 for the construction, demolition, replacement, major repair, renovation, planning or design of real property and improvements thereon except where such work is for the beneficial use of the Contractor. Section 312 does not apply to: (i) work, goods or services unrelated to this contract; or (ii) employment outside New York State. The Authority will consider compliance by a Contractor or its subcontractor with the requirements of any Federal law concerning equal employment opportunity which effectuates the purpose of this section. The Authority shall determine whether the imposition of the requirements of the provisions hereof duplicate or conflict with any such Federal law, and if such duplication or conflict exists, the Authority may waive the applicability of §312 of the Executive Law to the extent of such duplication or conflict. The Contractor shall comply with all duly promulgated and lawful rules and regulations of the Department of Economic Development's Division of Minority and Women's Business Development pertaining thereto.

12. **CONFLICTING TERMS**. In the event of a conflict between the terms of the contract (including any and all attachments thereto and amendments thereof) and the terms of this Appendix A, the terms of this Appendix A shall control.

13. **GOVERNING LAW**. This contract shall be governed by the laws of the State of New York except where the Federal supremacy clause requires otherwise.

14. **LATE PAYMENT**. Timeliness of payment and any interest to be paid to the Contractor for late payment shall be governed by State Public Authorities Law §2880 and 21 NYCRR Part 109.

15. **NO ARBITRATION**. Disputes involving this contract, including the breach or alleged breach thereof, may not be submitted to binding arbitration (except where statutorily authorized) but must, instead, be heard in a court of competent jurisdiction of the State of New York.

16. **SERVICE OF PROCESS**. In addition to the methods of service allowed by the State Civil Practice Law & Rules, the Contractor hereby consents to service of process upon it by registered or certified mail, return receipt requested. Service hereunder shall be complete upon the Contractor's actual receipt of process or upon the Authority's receipt of the return thereof by the United States Postal Service as refused or undeliverable. The Contractor must promptly notify the Authority, in writing, of each and every change of address to which service of process can be made. Service by the Authority to the last known address shall be sufficient. The Contractor will have thirty (30) calendar days after service hereunder is complete in which to respond.

17. **PROHIBITION ON PURCHASE OF TROPICAL HARDWOODS**. The Contractor certifies and warrants that all wood products to be used under this contract will be in accordance with, but not limited to, the specifications and provisions of State Finance Law §165 (Use of Tropical Hardwoods) which prohibits purchase and use of tropical hardwoods, unless specifically exempted, by the State or any governmental agency or political subdivision or public benefit corporation. Qualification for an exemption under this law will be the responsibility of the Contractor to establish to meet with the approval of the Authority.

In addition, when any portion of this contract involving the use of woods, whether supply or installation, is to be performed by any subcontractor, the prime Contractor will indicate and certify in the submitted bid proposal that the subcontractor has been informed and is in compliance with specifications and provisions regarding use of tropical hardwoods as detailed in State Finance Law §165. Any such use must meet with the approval of the Authority; otherwise, the bid may not be considered responsive. Under bidder certifications, proof of qualification for exemption will be the responsibility of the Contractor to meet with the approval of the Authority.

18. **MACBRIDE FAIR EMPLOYMENT PRINCIPLES**. In accordance with the MacBride Fair Employment Principles (Chapter 807 of the Laws of 1992), the Contractor hereby stipulates that the Contractor either (a) has no business operations in Northern Ireland, or (b) shall take lawful steps in good faith to conduct any business operations in Northern Ireland in accordance with the MacBride Fair Employment Principles (as described in State Finance Law §165), and shall permit independent monitoring of compliance with such principles.

19. **OMNIBUS PROCUREMENT ACT OF 1992**. It is the policy of New York State to maximize opportunities for the

participation of New York State business enterprises, including minority and women-owned business enterprises as bidders, subcontractors and suppliers on its procurement contracts.

Information on the availability of New York State subcontractors and suppliers is available from:

NYS Department of Economic Development
Division for Small Business
30 South Pearl Street – 7th Floor
Albany, NY 12245
Phone: (518) 292-5220
Fax: (518) 292-5884
http://www.esd.ny.gov

A directory of certified minority and women-owned business enterprises is available from:

NYS Department of Economic Development Minority and Women's Business Development Division
30 South Pearl Street – 2nd Floor
Albany, NY 12245
Phone: (518) 292-5250
Fax: (518) 292-5803
http://www.esd.ny.gov

The Omnibus Procurement Act of 1992 requires that by signing this bid proposal or contract, as applicable, the Contractor certifies that whenever the total bid amount is greater than $1 million:

(a) The Contractor has made reasonable efforts to encourage the participation of New York State Business Enterprises as suppliers and subcontractors, including certified minority and women-owned business enterprises, on this project, and has retained the documentation of these efforts to be provided upon request to the Authority;

(b) The Contractor has complied with the Federal Equal Opportunity Act of 1972 (P.L. 92-261), as amended;

(c) The Contractor agrees to make reasonable efforts to provide notification to New York State residents of employment opportunities on this project through listing any such positions with the Job Service Division of the NYS Department of Labor, or providing such notification in such manner as is consistent with existing collective bargaining contracts or agreements. The Contractor agrees to document these efforts and to provide said documentation to the Authority upon request; and

(d) The Contractor acknowledges notice that the Authority may seek to obtain offset credits from foreign countries as a result of this contract and agrees to cooperate with the Authority in these efforts.

20. **RECIPROCITY AND SANCTIONS PROVISIONS**. Bidders are hereby notified that if their principal place of business is located in a country, nation, province, state or political subdivision that penalizes New York State vendors, and if the goods or services they offer will be substantially produced or performed outside New York State, the Omnibus Procurement Act 1994 and 2000 amendments (Chapters 684 and 383, respectively) require that they be denied contracts which they would otherwise obtain. Contact the Department of Economic Development, Division for Small Business, 30 South Pearl Street, Albany, New York 12245, for a current list of jurisdictions subject to this provision. NOTE: As of October 2019, the list of discriminatory jurisdictions subject to this provision includes the states of South Carolina, Alaska, West Virginia, Wyoming, Louisiana and Hawaii.

21. **NON-PUBLIC PERSONAL INFORMATION**. The Contractor shall comply with the provisions of the New York State Information Security Breach and Notification Act (General Business Law §899-aa; State Technology Law §208). In addition to any relief or damages that may be imposed pursuant to the provisions of this Act, the Contractor shall be liable for the costs imposed upon the Authority which are associated with breach of the Act if caused by Contractor's negligent or willful acts or omissions, or the negligent or willful acts or omissions of the Contractor's agents, officers, employees or subcontractors.

22. **IRAN DIVESTMENT ACT**. In accordance with State Public Authorities Law §2879-c, if this is a contract for work or services performed or to be performed, or goods sold or to be sold, the Contractor subscribes and affirms, under penalty of perjury, that: by signing this contract, each person and each person signing on behalf of any other party certifies, and in the case of a joint bid 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 §165-a of the State Finance Law, entitled "Entities Determined to be Non-Responsive Bidders/Offerers pursuant to the New York State Iran Divestment Act of 2012" ("Prohibited Entities List") posted at: https://ogs.ny.gov/list-entities-determined-be-non-responsive-biddersofferers-pursuant-nys-iran-divestment-act-2012.

For the purposes of this clause, the term "person" shall be as defined in subdivision (1)(e) of §165-a of the State Finance Law.

Contractor further certifies that it will not utilize on this contract any subcontractor that is identified on the Prohibited Entities List. Contractor agrees that should it seek to renew or extend this contract, it must provide the same certification at the time the contract is renewed or extended. Contractor also agrees that any proposed Assignee of this contract will be required to certify that it is not on the Prohibited Entities List before the contract assignment will be approved by the Authority.

During the term of the contract, should the Authority receive information that a person (as defined in State Finance Law § 165-a) is in violation of the above-referenced certifications, the Authority will review such information and offer the person an opportunity to respond. If the person fails to demonstrate that it has ceased its engagement in the investment activity which is in violation of the Act within 90 days after the determination of such violation, then the Authority shall take such action as may be appropriate and provided for by law, rule, or contract, including, but not limited to, imposing sanctions, seeking compliance, recovering damages, or declaring the Contractor in default.

23. **OBSERVANCE OF LAWS**. The Contractor agrees to observe all applicable Federal, State and local laws and regulations, and to procure all necessary licenses and permits.

24. **NO WAIVER OF PROVISIONS**. The Authority's failure to exercise or delay in exercising any right or remedy under this contract shall not constitute a waiver of such right or remedy or any other right or remedy set forth therein. No waiver by the Authority of any right or remedy under this contract shall be effective unless made in a writing duly executed by an authorized officer of the Authority, and such waiver shall be limited to the specific instance so written and shall not constitute a waiver of such right or remedy in the future or of any other right or remedy under this contract.

25. **ENTIRE AGREEMENT**. This contract, together with this Appendix A and any other appendices, attachments, schedules or exhibits, constitutes the entire understanding between the parties and there are no other oral or extrinsic understandings of any kind between the parties. This contract may not be changed or modified in any manner except by a subsequent writing, duly executed by the parties thereto.

26. **ADMISSIBILITY OF REPRODUCTION OF CONTRACT.** Notwithstanding the best evidence rule or any other legal principle or rule of evidence to the contrary, the Contractor acknowledges and agrees that it waives any and all objections to the admissibility into evidence at any court proceeding or to the use at any examination before trial of an electronic reproduction of this contract, in the form approved by the State Comptroller, if such approval was required, regardless of whether the original of said contract is in existence.

27. **CERTIFICATION OF REGISTRATION TO COLLECT SALES AND COMPENSATING USE TAX BY CERTAIN STATE CONTRACTORS, AFFILIATES AND SUBCONTRACTORS.** To the extent this agreement is a contract as defined by Tax Law § 5-a, if the Contractor fails to make the certification required by Tax Law § 5-a or if during the term of the contract, the Department of Taxation and Finance or the Authority, as defined by Tax Law § 5-a, discovers that the certification, made under penalty of perjury, is false, then such failure to file or false certification shall be a material breach of this contract and this contract may be terminated, by providing written notification to the Contractor in accordance with the terms of the agreement, if the Authority determines that such action is in the best interest of the Authority.

28. **CONTRACT INVOLVING STEEL PRODUCTS**. Contracts involving steel products are subject to Public Authorities Law § 2603-a, and steel products to be provided or incorporated by Contractor must be produced or made in whole or substantial part in the United States as set forth therein.