George Latimer, Westchester County Executive

General Requirements and Proposals
Information for Bidders
General and Special Clauses
Technical Specifications

REHABILITATION OF GLEN ISLAND APPROACH BRIDGE OVER NEW ROCHELLE HARBOR (BIN 3348880) NEW ROCHELLE, NEW YORK

VOLUME 1 OF 2

Contract No. 20-517

Bid Opening: April 10, 2024

By Bidder (Please Print)	For Official Use Only
Firm/Business Name: _____	
Address: _____	_____
_____	_____

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

Division of Engineering

SPECIAL NOTICE

County of Westchester
New York

ADDENDA TO THE BID DOCUMENTS

Addenda to the Bid Documents will be published on the Empire State Purchasing Group website at (http://www.bidnetdirect.com/new-york) **It is the responsibility of each potential bidder to check the website on a regular basis for further information relative to the bid documents including information relating to any and all addenda** prior to submitting its bid. All Bidders are deemed to have reviewed and considered all addendums in their Bid.

SUBMISSION OF BIDS

Bidders should not submit the entire bid document with its bid submission. Instead, each bidder is required to submit the full set of designated Proposal Pages. The Proposal Pages are denoted by a border and are titled on the bottom as "Proposal Page ___". The Proposal Pages must be accompanied by the "Bid Bond and Consent of Surety" (as set forth in the Proposal Pages) attached to the outside of the sealed bid. A Bid Bond is NOT required for contracts of $100,000 or less. Failure to submit in this manner may cause the bid to be rejected.

The successful bidder will be required to furnish a Performance and Payment Bond.

SPECIAL NOTICE

County of Westchester
New York

MANDATORY PRE-BID SITE INSPECTION

A. Superseding the first paragraph of Article "3. PRE-BID SITE INSPECTION" of the Information for Bidders, Bidders are required to attend a Mandatory Pre-Bid Site Inspection at 10:00 a.m. Tuesday, March 19, 2024 at a meeting at the Glen Island Bridge, at which time they will examine the work site under escort by the County's representative.

BIDS FROM CONTRACTORS NOT IN ATTENDANCE AT THIS MEETING, OR THOSE WHO FAIL TO SIGN THE ATTENDANCE SHEET-WILL BE *REJECTED*

B. Bidders shall indicate their interest in the Mandatory Pre-Bid Site Inspection by contacting Esther Rivas, Department of Public Works and Transportation, Division of Engineering at (914) 995-5584.

C. All other portions of Article "3. PRE-BID SITE INSPECTION" of the Information for Bidders shall remain in full force and effect.

CONTRACT NO. 20-517

SPECIAL NOTICE

County of Westchester
New York

CONTRACTOR'S QUALIFICATIONS STATEMENT

Supplementing Notes 17 & 18 in the "Information for Bidders" section, **ALL** bidders shall submit the Contractor's Qualifications Statement included as part of this Special Notice along with their bid. The County reserves the right to not execute a contract with any bidder who fails to supply the information requested in this Special Notice.

Project Overview:

The Glen Island Bridge Rehabilitation Project is a complex project with historical considerations. This project introduces the element of heavy movable structures into pedestrian, bridge operation, and marine and roadway transportation environments. The need for coordination between work disciplines and experience with the inherent characteristics of this type of project is greater than for other projects including similar work. For this reason, contractor and subcontractor minimum qualifications are stipulated as detailed in the section below.

General Contractor Requirements:

- Provide written examples of acceptable capability and competency in the execution of at least five (5) bridge and roadway construction projects consisting of a bridge rehabilitation with the construction cost of at least one (1) exceeding $30M within the last ten (10) years.

  Rehabilitation projects shall be defined as a project with replacement of the entire floor system of a movable span (deck, stringers and floor beams) and reconstruction which required the re-alignment of the bascule span structure to the abutting fixed structure and/or an adjacent movable span. Replacement projects shall include complete superstructure replacement of an existing bridge of any type with a new bascule bridge.

- Identify past direct involvement of the Project Manager and Superintendent proposed for this Project by the Contractor in these roles or in roles of similar responsibility in a contract with multiple sub-contractors and/or vendors.

Contractor (Historical Preservation) Requirements:

Glen Island Approach Bridge is recognized for its historical engineering and architectural significance and has been deemed eligible for preservation by the National Register of Historic Places. The aesthetics of the rehabilitated structure shall be consistent with the architectural style of the existing structure and shall address State Historic Preservation Office (SHPO) requirements.

- Provide written examples of acceptable capability and competency in the rehabilitation of historic structures. Provide written examples of successful and substantial completion of three (3) historically significant building or bridge reconstruction projects in the preceding twenty (20) year period is required.

Specialty Item Contractor/Subcontractor Requirements:

Movable Bridge Structure Specialist-Supplementary Requirements

- Provide written examples of successfully and substantially completing a minimum of three (3) movable bridge reconstruction (replacement or major rehabilitation) projects within the preceding twenty (20) year period.
- A minimum of one (1) project of the three (3) must have been completed in the preceding ten (10) year period with direct involvement of the Specialist Lead proposed for this this Project by the Subcontractor in this leadership role.

Movable Bridge Machinery Specialist-Supplementary Requirements

- Provide written examples of successfully and substantially completing a minimum of three (3) movable bridge projects machinery reconstruction projects within the preceding twenty (20) year period.
- A minimum of one (1) project of the three (3) must include fabrication, assembly, field installation and alignment of span support machinery (trunnion shafts, trunnion hubs and trunnion bearings) for a bascule bridge.
- A minimum of one (1) project of the three (3) must include fabrication, assembly, field installation and alignment of operating machinery (motors, gear reducers, shafting, racks and pinions) and span lock machinery for a double leaf bascule bridge.
- A minimum of one (1) project of the three (3) must have been completed in the preceding ten (10) year period with direct involvement of the Specialist Lead proposed for this this Project by the Subcontractor in this leadership role.

Movable Bridge Electrical Specialist-Supplementary Requirements

- Provide written examples of successfully and substantially completing a minimum of three (3) movable bridge projects machinery reconstruction projects within the preceding twenty (20) year period.
- A minimum of one (1) project must include the fabrication, assembly, shop testing and field installation and testing of a complete programmable logic controller (PLC) control system for either a double leaf bascule span, single leaf bascule span or a vertical lift span.
- A minimum of one (1) project must include the integration of an auxiliary generator with a PLC control system for a movable bridge.
- A minimum of one (1) project must have been completed in the preceding ten (10) year period with direct involvement of the Specialist Lead proposed for this Project by the Subcontractor in this leadership role.

Movable Bridge Houses Specialist-Supplementary Requirements

- Identify how specialist has successfully and substantially completed a minimum of three (3) movable bridge reconstruction (replacement or major rehabilitation) projects within the preceding twenty (20) year period with Control House and Machinery House work.
- Qualifying projects shall include a new or rehabilitated Control House and Machinery House with installation of new mechanical and electrical movable bridge components in these facilities.
- A minimum of one (1) project of the three (3) must have been completed in the preceding ten (10) year period with direct involvement of the Specialist Lead proposed for this this Project by the Subcontractor in this leadership role.

If a Specialty Item Specialist Subcontractor is utilized, the resume of the Specialty Item Specialist Subcontractor must be submitted for each discipline.

In the event the Contractor elects to self-perform any or all of the specialty work described above under the:

- Movable Bridge Structure Specialist
- Movable Bridge Mechanical Specialist
- Movable Bridge Electrical Specialist
- Movable Bridge Houses Specialist

and not utilize a Specialist Subcontractor, the Contractor must meet, at a minimum, the supplementary requirements defined above for each specialty they elect to self-perform. The specific qualifications for the Contractor relative to the Specialist scope must be submitted in addition to the general Contractor requirements.

Westchester County

Contractor's Qualifications Statement

Company Name: _____

PROJECT NAME	
PROJECT LOCATION	
DESCRIPTION OF PROJECT WORK[1]	
CLIENT REFERENCE NAME AND CONTACT INFO	
CONTRACTOR'S CONSTRUCTION MANAGER:	
KEY PERSONNEL (include titles)	
PROJECT DETAILS	Contract Amount: Completion Date: % Self-Performed Work:

1 – See Contractor's Qualifications Statement Special Notice for preferred work experience.

Page _____ of _____ Contractor may print out additional pages as needed.

CONTRACT NO. 20-517

SPECIAL NOTICES

County of Westchester
New York

PENDING PERMITS

A joint application for permits has been submitted to the New York State Department of Environmental Conservation (NYSDEC) and the United States Army Corps of Engineers (USACE) for this project.

The following NYSDEC permits have been applied for:

- NYSDEC Section 401 Water Quality Certification
- NYSDEC Tidal Wetlands
- NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity

The following USACE permits have been applied for:

- USACE General Nationwide Permits No. 3 and No. 33
- Section 106 of NHPA

The following USCG permits have been applied for:

- USCG Bridge Permit

As of this date, the County is awaiting receipt of the permit documents. Once obtained they shall be incorporated into the project specifications via addendum and the bidders shall be expected to understand and comply with all conditions and terms of the permits.

CONTRACT NO. 20-517

SPECIAL NOTICE

County of Westchester
New York State

REGULATORY PERMIT REQUIREMENTS:

List of required Special Notice Permit Conditions

1. No in-water work involving disturbance of sediments or placement of fill shall occur between January 16 and September 30.

2. Dredged material resulting from submarine cable installation shall be returned to the New Rochelle Harbor bottom. If dredged material is removed from the site, the Contractor is responsible for meeting all sediment testing, management, and disposal requirements.

3. Dredged material shall not be reused on upland portions of the site. The Contractor is responsible for all approvals required for the reuse of dredged material.

4. Contractor shall be responsible for coordination with the U.S. Coast Guard and issuing all necessary local notice to mariners prior to in-water work and work affecting New Rochelle Harbor navigation.

5. Contractor shall plan the work to minimize the duration of navigational obstructions within New Rochelle Harbor.

6. Soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed upland soil or fills within New Rochelle Harbor must be permanently stabilized at the earliest practicable date.

7. Contractor shall adhere to all applicable federal, state, and local regulatory requirements, in addition to the owner furnished permits.

SPECIAL NOTICE

County of Westchester
New York

MANDATORY OSHA CERTIFICATION

When a public works contract is in excess of $250,000.00, all employees are required to have successfully completed the OSHA 10 hours training class. All contractors and subcontractors must attach copies of proof of completion of the OSHA 10 hour course by all employees to the first certified payroll submitted to the County and on each succeeding payroll where any new or additional employee is first listed. Employees may be requested by the County's representative to verify compliance with the OSHA 10 hour course by showing their OSHA card.

When a public works contract is in excess of $1,000,000.00, all employees are required to have successfully completed the OSHA 30 hours training class. All contractors and subcontractors must attach copies of proof of completion of the OSHA 30 hour course by all employees to the first certified payroll submitted to the County and on each succeeding payroll where any new or additional employee is first listed. Employees may be requested by the County's representative to verify compliance with the OSHA 30 hour course by showing their OSHA card.

In addition, on any contract that includes excavation of underground facilities, the excavator is required to be certified and have completed the training and education program provided by the one-call notification system (Dig Safely New York, Inc. Certified Excavator Program in Safe Digging Best Practices) or any other provider authorized by the public service commission to administer such training and education program.

SPECIAL NOTICE

County of Westchester
New York

INSURANCE REQUIRED:

In addition to the insurance requirements listed in Section 2 of the Information for Bidders, the Contractor, at their own cost and expense, shall provide and maintain the following:

BUILDERS RISK INSURANCE

The Contractor must provide and maintain a **Builder's Risk Form, All Risk Insurance Contract.** The coverage shall be written for **100% of the completed value,** with the County of Westchester named as loss payee as its interest may appear. In formulating its proposal, the Contractor shall include the costs for this coverage. In the event that claims, for which the County may be liable, in excess of the insured amounts provided herein are filed by reason of Contractor's negligent acts or omissions under the Agreement or by virtue of the provisions of the labor law or other statute or any other reason, the amount of excess of such claims or any portion thereof, may be withheld from payment due or to become due the Contractor until such time as the Contractor shall furnish such additional security covering such claims in form satisfactory to the County of Westchester.

OWNERS PROTECTIVE LIABILITY POLICY

Contractor must also provide an Owners Protective Liability Policy naming the County of Westchester as insured, with a minimum limit of liability per occurrence of $3,000,000. NOTE: Owners And Contractors Protective Liability (OCP) coverage is required for work involving climbing, scaffolding, cranes, or other lift devices.

CRANE, RIGGING & CRANE OPERATOR (RIGGER LIABILITY) INSURANCE

Crane, Rigging, & Crane Operator (Rigger Liability) Insurance with a minimum combined single limit of $10,000,000 unless otherwise indicated in the contract specifications. This insurance shall include coverage for bodily injury and property damage and name the "County of Westchester" as additional insured. This total minimum limit may be achieved through any combination of primary, excess, or umbrella policies.

In addition, any cranes or equipment used to lift material up to the roofs shall be approved with the County minimum 72 hr. prior to use. Contractor is required to obtain all permits for such cranes or equipment as required by the local municipality. If required, contractor to provide NYS PE stamped shop drawings for all such equipment, cost of which shall be included in the contractors bid. Contractor shall also obtain any required permits from the municipality for any road closures or use of adjacent parking lots needed to complete their work.

SPECIAL NOTICES

County of Westchester
New York

WESTCHESTER COUNTY SPECIFICATIONS FORMAT

The following terminology may be found in various locations throughout the contract documents and are interchangeable and equivalent:

"OLD" COUNTY ITEM FORMAT		"NEW" COUNTY ITEM FORMAT
Item W699.020001 - Mobilization	=	Item 699.020001WE - Mobilization
Item W699.040002 - Contract Bonds And Insurance	=	Item 699.040002WE - Contract Bonds And Insurance
Item W800 – Miscellaneous Additional Work	=	Item 800.000000WE - Miscellaneous Additional Work
Item W851 - Testing Of Materials And Field Testing Equipment	=	Item 851.000000WE - Testing Of Materials And Field Testing Equipment

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County of Westchester
New York

ADDITIONAL INSURANCE REQUIREMENTS

The Contractor shall be required to provide additional Insurance in the amounts not less than those required for the County of Westchester under Article 7, titled "Insurance Requirements" of the "Information for Bidders" section of these specifications for the following agencies:

1. City of New Rochelle
   City Hall
   515 North Avenue
   New Rochelle, NY 10801

All of the above shall be included as separate fully insured agencies.

SPECIAL NOTICES

County of Westchester
New York

TEMPORARY SERVICE

Superseding General Clauses, Section 48 – Temporary Service:

A. Sanitary facilities will be provided by the Contractor for its own personnel.

B. The Contractor shall supply and pay for the cost of all temporary water and electrical power. The Contractor shall furnish and install all temporary electrical and water connections required for work under this contract, at and to locations as designated by the Construction Administrator.

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SPECIAL NOTICE

County of Westchester
New York

QUESTIONS DURING BIDDING

No interpretation of the meaning of the plans, specifications or other contract documents will be made to any bidder orally. Every request for such interpretation shall be in writing addressed to the Westchester County Project Manager. The inquiries shall be sent to:

Esther Rivas
Westchester County Department of Public Works and Transportation,
148 Martine Avenue, Suite 500
White Plains, New York 10601
(egr3@westchestergov.com)

To be given consideration, questions must be received by **March 28, 2024 at 5:00 PM.** Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications.

Addenda to the Bid Documents will be published on the on the Empire State Purchasing Group website at (http://www.bidnetdirect.com/new-york) I**t is the responsibility of each potential bidder to check the website on a regular basis for further information relative to the bid documents including information relating to any and all addenda** prior to submitting its bid. All Bidders are deemed to have reviewed and considered all addendums in their Bid. Failure of any bidder to receive any such addendum or interpretation or any other form, instrument or document shall not relieve any bidder from any obligation under its bid as submitted. All addenda so issued shall become part of the contract documents.

A bidder's failure to request a clarification, interpretation, etc. of any portion of the plans, specifications, or contract or to point out any inconsistency therein will preclude such bidder from thereafter claiming any ambiguity, inconsistency, or error which should have been discovered by a reasonably prudent bidder and from asserting any claim for damages arising directly or indirectly therefrom.

SPECIAL NOTICE

County of Westchester
New York

JOINT VENTURES OR CONTRACTORS COMPRISED OF MORE THAN ONE LEGAL ENTITY

(a) If the Contractor is a joint venture or otherwise comprised of more than one legal entity or any group of partners, participants or joint ventures associated for the purpose of undertaking this agreement, each such entity, partner and/or participant acknowledges and hereby affirmatively represents and agrees that each has the power to bind the Contractor and each of the others hereunder; and as such, each acts both as principal and agent of the Contractor and of each of the others hereunder. Each further acknowledges and agrees that all such entities, participants and/or partners of the joint venture associated for the purposes of undertaking this agreement expressly agree to be jointly and severably liable for any and all obligations and/or liabilities of the Contractor arising in any way out of and in connection with this agreement.

(b) If the Contractor is a joint venture, or otherwise comprised of more than one legal entity or any group of partners, participants or joint ventures associated for the purposes of undertaking this agreement, the Contractor represents and warrants to the County that it is duly organized under the laws of the State of New York, and that each and every entity, partner, participant or joint venture of Contractor agrees to separately execute the agreement, by its own authorized representative, with the appropriate acknowledgment and verification.

(c) If the Contractor is a joint venture or otherwise comprised of more than one legal entity or any group of partners, participants or joint ventures associated for the purpose of undertaking this agreement, either at least one such entity, partner and/or participant comprising the Contractor and on behalf of the Contractor or the Contractor itself, shall comply with all requirements of the bid specifications herein and prerequisites to submit a bid, including but not limited to attendance of any mandatory pre-bid meetings, if any, and obtaining the bid documents and any addenda from the Empire State Purchasing Group website, or any successor website for posting of bid documents.

(d) If the Contractor is a joint venture or otherwise comprised of more than one legal entity or any group of partners, participants or joint ventures associated for the purposes of undertaking this agreement, each such entity, partner and/or participant acknowledges and hereby affirmatively represents and agrees that the respective rights, duties and liabilities of each hereunder shall be governed by the laws of the State of New York, including but not limited to the New York Partnership Law.

CONTRACT NO. 20-517

SPECIAL NOTICE

County of Westchester
New York

MINORITY PARTICIPATION POLICY

Contractors must comply with the County's Minority Participation Policy, including, but not limited to, the requirement that contractors make a demonstrated good faith effort to utilize Minority Owned Businesses ("MOB") and Women Owned Businesses ("WOB") (see IFB Article 36). To assist contractors in this effort the County has made available a list of MOB and WOB at http://mwbe.westchestergov.com/ Contractors are also encouraged to utilize other sources to identify potential MOB and WOB as subcontractors and suppliers.

All bidders must submit as part of their bid package the Minority/Women Owned Business Enterprise Questionnaire located in the Proposal Page section of the bid documents.

CONTRACT NO. 20-517

SPECIAL NOTICE

County of Westchester
New York

CHANGES IN THE WICKS LAW

Effective July 1, 2008, construction contracts of one million five hundred thousand dollars or less will not require the preparation of separate contracts for plumbing and gas fitting; steam heating, hot water heating, ventilation and air conditioning apparatus; and electric wiring and standard illuminating fixtures and general construction.

Each bidder on a public work contract, where the preparation of separate contracts is not required shall, to the full extent applicable, submit with its bid a separate sealed list that names each Subcontractor that the bidder will use to perform work on the contract and the agreed upon price to be paid to each for (a) plumbing and gas fitting, (b) steam heating, hot water heating, ventilating and air conditioning apparatus and (c) electric wiring and standard illuminating fixtures and (d) general construction. The submission (Proposal Page 6) that contains the agreed upon price shall be acknowledged by both Contractor and Subcontractor. For purposes of this paragraph, the acknowledgment from the Subcontractor may contain the facsimile signature of an officer of the Subcontractor.

After the low bid is announced, the sealed list of subcontractors submitted with the bid shall be opened and the names of such subcontractors shall be announced. Thereafter, any changes of subcontractors or agreed-upon amount to be paid to each shall require the approval of the County upon a showing of legitimate construction need for such change.

The Successful low bidder, before award of the contract, must procure and provide to the County, from each of the above denoted Subcontractors, a Contract Disclosure Statement and the Required Disclosure of Relationships to County forms.

The sealed lists of Subcontractors submitted by unsuccessful bidders shall be destroyed after the contract award.

THIS PROJECT IS NOT SUBJECT TO THE REQUIREMENTS OF THE "WICKS LAW". ACCORDINGLY, EACH BIDDER IS REQUIRED TO SUBMIT SPECIFIC INFORMATION PERTAINING TO ITS PROPOSED SUBCONTRACTORS. PLEASE SEE THE "NOTICE TO CONTRACTORS" THAT FORMS A PART OF THESE BID DOCUMENTS.

SPECIAL NOTICE

County of Westchester
New York

COMPLETION OF GRANT FUNDING FORMS

The bidders are hereby notified that if this project, or any portion thereof, is funded by a grant then the contractor will be responsible to complete all appropriate forms as required by the grant agency in order to complete the application.

PROMPT EXECUTION AND RETURN OF CONTRACT

A. The successful bidder is required to return the completed contract to the County within ten (10) days of receipt of the execution copy of the contract. The contract must be signed, notarized and returned to the County with all insurance certificates, bonds and supporting documentation, including all required Subcontractor information.

B. The County reserves all of its rights, including, but not limited to, proceeding against the bid bond, if the successful bidder fails to submit the complete executed package within the above time frame.

SPECIAL NOTICE

County of Westchester
New York

PROOF OF PAYMENT BY CONTRACTOR TO SUBCONTRACTORS AND MATERIALMEN.

In addition to and without limiting any of the provisions set forth in Section 23 of the Information for Bidders, after the Contractor completes 50% of the work under the contract, the Contractor may be required to supplement each requisition submitted to the County with documentation that establishes that the Contractor has timely and properly paid its subcontractors and materialmen as required by Section 23 of the Information For Bidders. Such documentation may include copies of both sides of cancelled check(s) paid to the order of the subcontractors and materialmen and such other documentation as may be reasonably requested by the Commissioner. If the Contractor fails to submit such documentation, the Commissioner may, in his sole discretion, withhold payment of the requisition until such time as the documentation is properly submitted. Nothing herein is intended or shall be construed to confer upon or give any subcontractor or materialman, or its successors and assigns, any third party beneficiary rights, remedies or basis for reliance upon, under or by reason of the contract or this Special Notice provision.

SPECIAL NOTICE

County of Westchester
New York

PREVAILING WAGE

All public works contracts are subject to the payment of the prevailing wage and supplements as set forth by the laws of the State of New York, including, but not limited to, Articles 8 and 9 of the New York Labor Law (the "Prevailing Wage Laws"). Westchester County has an active Prevailing Wage Enforcement Officer who enforces the Prevailing Wage Laws within the County for public works contracts, including reviewing certified payroll records, visiting job sites, interviewing the employer and employees (See IFB Article 12) and, if necessary, requesting copies of cancelled checks.

Any Contractor who fails to comply with the Prevailing Wage Laws, including, but not limited to, failing to pay the prevailing wage rates and supplements, failing to submit certified payroll records to the County or failing to post the prevailing wage rates and supplements at the work site, will be subject to enforcement as provided for in the Contract and laws of the State of New York through the Westchester County District Attorney's office, the Commissioner of the New York State Department of Labor, the County and/or the employee who suffered the underpayment. This enforcement could include, but is not limited to, criminal penalties, civil penalties, debarment from future bid awards, the withholding of payment under the Contract to satisfy the unpaid wages and supplements, including interest and civil penalty. In addition, such a failure shall constitute grounds for cancellation of the Contract (IFB 8(C)). Moreover, a prime contractor is responsible for its subcontractor's failure to comply with, or evasion of, the provisions of the Prevailing Wage Laws.

CONTRACT NO. 20-517

SPECIAL NOTICE

County of Westchester
New York

PROJECT LABOR AGREEMENT (PLA)

A. The County of Westchester has determined that a Project Labor Agreement will be used on this Project. The successful bidder will be required as a condition of this Contract to execute the PLA with the Building and Construction Trades Council of Westchester and Putnam Counties, New York, AFL-CIO ("Council"). The PLA will be substantially in the same form as the PLA included in this contract specification book. Bidders are urged to familiarize themselves with the terms and conditions of the PLA.

B. It should be noted that Schedule A of the PLA contains a list of the local unions affiliated with the Council. Copies of the applicable Collective Bargaining Agreements of the local unions can be obtained by writing to the Building and Construction Trades Council of Westchester and Putnam Counties, New York, AFL-CIO at 258 Saw Mill River Road, Elmsford, New York 10523, Attn.: Carol A. Boccardi.

NOTICE TO CONTRACTORS

County of Westchester
New York

Sealed proposals for the following construction work:

CONTRACT NO: 20-517

ADVERTISING: March 8, 2024

MANDATORY PRE-BID INSPECTION: March 19, 2024

REHABILITATION OF GLEN ISLAND APPROACH BRIDGE OVER NEW ROCHELLE HARBOR (BIN 3348880) NEW ROCHELLE, NEW YORK

will be received by the Board of Acquisition and Contract in Room 528, Michaelian Office Building, 148 Martine Ave., White Plains, New York until 11:00 a.m., **Wednesday, April 10, 2024**, and immediately thereafter, the bids will be publicly opened and read aloud in Room 527 of the said building. The bid opening also will be made accessible to the public via the livestreaming service WebEx. The livestreaming of the bid opening via WebEx is in addition to and not in place of the publicly bid opening to be held in Room 527 of the Michaelian Office Building. For additional bidding information or questions call (914) 995-2274.

Instructions for livestreaming via WebEx. Attendees may join by computer browser at https://westchestergov.webex.com/meet/bac-bidopening or by phone 1-415-655-0001 US Toll or 1-844-621-3956 US Toll Free. The Access Code is 614 981 028.

The Bid Documents (General Requirements, Information for Bidders, Technical Specifications, etc. with Authorized Proposal Pages) **MUST BE OBTAINED from the Empire State Purchasing Group website at the following web address:** http://www.bidnetdirect.com/new-york.
There is no cost to the bidder for this service. Bid documents will be available after 1:00 p.m. on the advertising date.

PLEASE TAKE NOTICE: IN ORDER TO SUBMIT A BID, BIDDERS MUST REGISTER AND DOWNLOAD THE BID DOCUMENTS FROM THE EMPIRE STATE PURCHASING GROUP WEBSITE AND MUST REGISTER USING THE NAME OF THE PERSON OR BUSINESS ENTITY THAT WILL BE SUBMITTING THE BID. IN ORDER TO ENSURE THAT COUNTY BID DOCUMENTS HAVE NOT BEEN ALTERED IN ANY WAY, THE COUNTY WILL NOT ACCEPT BIDS FROM PERSONS OR BUSINESS ENTITIES THAT HAVE NOT FOLLOWED THIS REQUIREMENT.

The Bid Documents include Contract Drawings which **MAY BE OBTAINED at no cost on the Empire State Purchasing Group website at the following web address:** http://www.bidnetdirect.com/new-york, after 1:00 p.m. on the advertising date.

If the bidder is unable to utilize the electronic version of the Contract Drawings that are available on the Empire State Purchasing Group Website, the bidder may purchase copies of the Contract Drawings. Contract Drawings may be obtained from the Office of the Board of Acquisition and Contract at the above address after 1:00 p.m. on the advertising date and between the hours of 9:00 a.m. to 4:00 p.m. Monday thru Friday. Copies of the Contract Drawings shall be made available upon payment of a personal check, company check or money order made payable to the County of Westchester, in the amount of **$100.00** per set. For bidders, the deposit for each set of drawings will be refunded in full if returned in good condition within thirty days after award or rejection of bids. For non-bidders, only fifty percent of the deposit will be refunded. No refunds will be made to the successful bidder.

Each bidder is required to submit the full set of authorized Proposal Pages and all bids over **$100,000** must also be accompanied by the "Bid Bond and Consent of Surety" (as set forth in the Proposal Pages) attached to the outside of the sealed bid. Failure to submit in this manner may cause the bid to be rejected. **The successful bidder, no matter the amount of its bid, will be required to furnish a Performance and Payment Bond with its signed contract.**

To the full extent applicable, each bidder shall submit with its bid a separate sealed list that names each Subcontractor that the bidder will use to perform work on the contract and the agreed upon price to be paid to each for: (a) plumbing and gas fitting, (b) steam heating, hot water heating, ventilating and air conditioning apparatus and (c) electric wiring and standard illuminating fixtures and (d) general construction. The submission (Proposal Page 41) that contains the agreed upon price shall be acknowledged by both Contractor and Subcontractor. For purposes of this paragraph, the acknowledgment from the Subcontractor may contain the facsimile signature of an officer of the Subcontractor.

The Successful low bidder, before award of the contract, must obtain and provide to the County, from each of the above denoted Subcontractors, fully completed and signed Contract Disclosure Statement (Proposal Pages 24-32) and Required Disclosure of Relationships to County (Proposal Pages 33) forms.

The sealed lists of Subcontractors submitted by unsuccessful bidders shall be destroyed, unless you request that it be returned by checking the applicable box on Proposal Page 5.

The County of Westchester reserves the right to waive any informalities in the bids, or to reject any or all bids. No bidder may withdraw its bid within forty-five (45) days after the date of the bid opening.

Pursuant to Chapter 308 of the Laws of the County of Westchester, it is the goal of the County to use its best efforts to encourage, promote, and increase the participation of business enterprises owned and controlled by persons of color or women - Minority Business Enterprise (MBE) and Women Business Enterprise (WBE).

REMINDER: All required licenses should be submitted with the Bid.

COUNTY OF WESTCHESTER, NEW YORK
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

BY: Hugh J. Greechan, Jr., P.E., Commissioner

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Schedule Of Hourly Rates And Supplements

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CONTRACT NO. 20-517

NEW YORK STATE & WESTCHESTER COUNTY SPECIAL SPECIFICATIONS

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CONTRACT NO. 20-517

NEW YORK STATE & WESTCHESTER COUNTY SPECIAL SPECIFICATIONS

1. GENERAL REQUIREMENTS AND PROPOSALS

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

Division of Engineering

GENERAL REQUIREMENTS

1. DESCRIPTION OF THE WORK

Work under this Contract includes all necessary labor, materials and equipment required to:

- Erect temporary bridge, Work Zone Traffic Control, temporary signals, temporary barriers and tie-in points. Remove and replace existing bridge deck, sidewalks, floor beams, stringers, grid deck, bearings, barriers, fender system and railings. Perform steel strengthening repairs on the approach girders and concrete repairs on the plaza structure. Mill and replace overlay at the plaza structure. Reconfigure control house lower level including restroom and kitchen facilities. Upgrade electrical components including replacement submarine cable, warning/barrier gates, PLC cabinet, control desk, CCTV system, MCC, MDP and generator. Upgrade bascule span mechanical components including span locks, auxiliary drive machinery, operating machinery, trunnions, dewatering system and centering devices. Construct new sanitary sewer line from control house to Harbor Lane. Place new asphalt roadway surface, curbs, sidewalk and striping on at-grade approaches.

It is not intended that this description of work mention each particular item required, but that it give information concerning the general scope and areas of work for the convenience of the bidders.

THIS PROJECT IS NOT SUBJECT TO THE REQUIREMENTS OF THE "WICKS LAW". ACCORDINGLY, EACH BIDDER IS REQUIRED TO SUBMIT SPECIFIC INFORMATION PERTAINING TO ITS PROPOSED SUBCONTRACTORS. PLEASE SEE THE "NOTICE TO CONTRACTORS" THAT FORMS A PART OF THESE BID DOCUMENTS.

2. SUBCONTRACTING & DIRECT EMPLOYMENT OF LABOR

The Contractor shall not subcontract more than ninety (90%) percent of its bid. The Contractor must directly employ at least ten (10%) percent of the personnel working on this contract as measured in man-days worked.

"Directly employ" shall be construed to include only workers employed and paid directly by the Contractor, usually for wages or salary.

The Contractor expressly acknowledges that any violation of this provision constitutes a default under this contract.

3. REQUIRED TIME FOR COMPLETION OF THE WORK

Notification to commence the work will require the mandatory submission of all the executed contracts and the Certificates of Insurance after receipt of authority to award.

The Contractor shall commence the work embraced in this contract within ten (10) days of the service of Notice by the County to do so and shall complete the said work within **900** consecutive calendar days computed from the date of such Notice to commence.

4. SECURITY REGULATIONS

Security Regulations For all County Facilities except County Correctional Facilities:

A. Contractor's attention is called to the fact that this work is to be performed on property which is the responsibility of the County; therefore, all personnel associated with this contract are subject to special conditions affecting security and control of the facilities operations. Every person required to enter the work site will be issued an ID card and be required to fill out appropriate applications. **There is a $30.00 processing fee for each lost ID card**; remitted by check made payable to the County of Westchester. All ID processing will be scheduled by the Construction Administrator.

B. The Contractor/Subcontractor shall issue a copy of the security regulations (Paragraph C) to all personnel engaged on this project.

C. All Contractor/Subcontractor personnel shall be bound by the following security regulations for the duration of this contract.

1) All personnel must conspicuously display the ID card and identify themselves upon request.
2) If an ID card is misplaced or lost, report this immediately to the Inspector.
3) All Contractor/Subcontractor personnel are responsible for all tools and equipment and you must report any loss immediately to the Construction Administrator.
4) All personnel must observe all orders of the Owner.
5) All personnel are to report any unusual incidents or problems to the Construction Administrator immediately.
6) All personnel shall not possess or consume any alcoholic beverage or illegal drug or medication while on the property, or report to work under the influence of alcohol or drugs.
7) Any vehicle left on the property must be locked and the ignition keys must be removed. Vehicles will not be left overnight without prior approval.
8) All personnel shall not enter any other areas of the premises (except the areas agreed to) without prior approval of the Construction Administrator.

Security Regulations For County Correctional Facilities:

A. Contractor's attention is called to the fact that this work is to be performed on property adjacent and/or within the County's Correctional Facilities; therefore, all personnel associated with this project are subject to special conditions affecting security and control of the Correctional Facility Operations. Every person required to enter the work site will be fingerprinted, processed for a photo ID card and be required to fill out appropriate applications. **There is a $100.00 processing fee for each person**, checks made payable to the Commissioner of Finance. All ID processing will be scheduled by the Construction Administrator.

B. All Contractors and Subcontractors shall issue a copy of the security regulations (Paragraph C) to all personnel to be engaged on this project.

C. All Contractor's and Subcontractor's personnel shall be bound by the following security regulations for the duration of this project.

1) All personnel entering the Penitentiary, Jail or Women's Unit must stop and identify themselves to the Control or Desk Officer who will issue the appropriate pass after ascertaining that they have been cleared to enter the facility. Only workers with valid ID will be permitted entry. **NO HELPERS**.

2) All personnel must sign in the Visitor's Book, to include the following information: **PERSON'S NAME, COMPANY NAME, REASON FOR ENTRY, WORK LOCATION IN BUILDING**.
3) All personnel must conspicuously display the ID card and identify themselves upon request.
4) If ID card is misplaced or lost, report this loss immediately to the Shift Captain or Associate Warden.
5) All tradesmen will be required to perform a tool inventory inspection of all tools in their possession to demonstrate to the admitting Correction Officer that the typed inventory list matches the tools each time they enter and leave the building. The tradesmen are responsible for keeping all tools and equipment locked when not in immediate use and they must report any loss of tools or equipment immediately to the Shift Captain or Associate Warden.
6) All tradesmen and helpers shall carry all tools in a locked and secured tool box or tool cart. A typed inventory sheet shall be carried with the tool box/cart listing all hand and power tools. A manufacturer's MSD Sheet shall be carried with the tool box/cart for any chemical compound that the tradesman has in his/her possession.
7) All debris (i.e. packaging, demolition, etc) shall be removed from the worksite at the end of each workday.
8) All personnel are subject to search at all times.
9) All personnel must observe all orders of Correctional Staff.
10) All personnel are to report any unusual incidents or problems to a Correction Officer, Shift Captain or the Associate Warden immediately.
11) All personnel shall not possess or consume any alcoholic beverage or illegal drug or medication while on County property, or report to work under the influence of alcohol or drugs.
12) Any vehicle left on County property must be locked and the ignition keys must be removed. Vehicles will not be left over-night on County property without prior approval.
13) All personnel shall not enter any other areas of the prison (except the areas agreed to) without prior approval of the Shift Captain or the Associate Warden.
14) All personnel shall not bring anything in for any inmate/detainee or staff member or take out anything for any inmate/detainee or staff member.
15) All personnel shall not engage in any unnecessary conversations with any inmate/detainee.
16) Weapons, i.e., guns, knives, blackjacks, to include any tool activated by gunpowder or other explosive charge is prohibited in the building (i.e., stud gun). Violators of this rule are subject to arrest.
17) All personnel must sign out when leaving and must return the ID card to the Control/Desk Officer before leaving.
18) Failure of the contractor to follow these procedures will result in the contractor being denied access to the facility.

5. PAYMENT FOR BONDS AND INSURANCE

The amount bid for contract bonds and insurance shall not exceed 3% of the total contract price excluding the bid price for Miscellaneous Additional Work (Item W800) and Field Testing Equipment (W851), where applicable. Should the bidder exceed the foregoing three percent (3%), the Department will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

The amount bid shall be payable with the first contract payment.

CONTRACT DRAWINGS:
CONTRACT NUMBER 20-517

The Design Drawings, as listed on the Contract Drawing Index, herewith made a part of these Specifications, shows in general and/or in detail the work to be done under this Contract and/or the various Contracts forming the entire work for the Project, as described herein.

After sending the executed contract to the County and prior to the first job meeting, the Contractor is responsible for obtaining from Public Works, Division of Engineering, Michaelian Office Building, White Plains, a maximum of five gratis copies of the Contract Drawings and Specifications; for the Contractor's permanent possession. Additional sets, requested by the Contractor, beyond the permitted number and time limit, will be furnished by Public Works; but at the Contractor's expense.

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George Latimer, Westchester County Executive

PROPOSAL PAGES

REHABILITATION OF GLEN ISLAND APPROACH BRIDGE OVER NEW ROCHELLE HARBOR (BIN 3348880) NEW ROCHELLE, NEW YORK

Contract No. 20-517

Bid Opening: April 10, 2024

By Bidder (Please Print)	**For Official Use Only**
Firm/Business Name: _____	
Address: _____	_____
_____	_____

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

Division of Engineering

PROPOSAL REQUIREMENTS

BIDDER'S IDENTIFICATION

CONTRACT NO._____

To the Commissioner of Public Works, Westchester County, New York, acting for the party of the first part.

Proposal made by _____
as party of the second part.

Whose business address is _____

_____

_____

Whose telephone number is _____

Whose E-mail address is _____

Whose Federal ID number is _____

Is bidder an individual,
a partnership or a corporation? _____

If a partnership or corporation,
give the names of all partners
or officers with their titles _____

_____

_____

_____

_____

If operating under a trade name or as partners, has the required Certificate been filed with a County Clerk in accordance with the General Business Law, Section 130?

Yes....[ ] No....[ ] N.A….[ ]

If the answer is NO, Certificate must be filed before the contract can be executed.

NOTE: the bid must be submitted using the Contractor's legal name, not just the "doing business as" (i.e. DBA) name.

COMPLETE THIS FORM USING BLACK INK ONLY

PROPOSAL REQUIREMENTS

1. The undersigned, the bidder, does hereby declare that it has carefully read the contract specifications and has carefully studied the relevant plans, profiles and other drawings (as defined in Article "Contract Drawings" of the General Requirements) relating to the contract work, and has inspected the site(s) of the work..

2. The undersigned does hereby declare that it is the only one interested in its indicated bid; that the bid is in all respects without fraud or reservations; and that no official of the County or of the participating municipalities (if any), or any person in the employ of the County of participating municipalities (if any) is directly interested in the contract bid or in the supplies, equipment or works to which it relates, or in any part of the profits resulting there-from.

3. The undersigned does hereby offer and agree to furnish all materials, to fully and faithfully construct, perform and execute all work under the contract in accordance with the plans, profiles, other drawings and specifications relating thereto, and to furnish all labor, tools, implements, machinery, forms, transportation and materials necessary and proper for said purpose at the following indicated lump sum price for the total work and/or the following indicated unit prices for the various items of the work.

4. The undersigned does hereby declare that the indicated price(s) cover all expenses of every kind incidental to the completion of the contract work, including all claims affecting the work, labor and materials, which may arise through any cause whatsoever, excepting as provided for in Article "Disputed Work-Notice Of Claims For Damages: of the General Clauses.

5. The undersigned hereby agrees that in the event that the quantities of contract work actually performed by the undersigned are less than the approximate quantities indicated in the specifications it will make no claim(s) for loss of anticipated profits.

6. The undersigned does hereby agree that it will execute a contract containing all the terms, conditions, provisions and covenants necessary to complete the work according to the appropriate plans and specifications, within ten working days after receipt by the undersigned of the contract from the County, and that if it fails to execute said contract within said period of time the County may rescind the contract award and may retain as liquidated damages and not as a penalty, any amounts submitted as the bid security accompanying the undersigned's proposal, and/or demand from the Bidder's Surety Company that executed the required Bid Bond and Consent of Surety to pay to the County the difference between the amount bid and the amount for which such contract is thereafter awarded, together with the cost to the County of reletting said contract up to the maximum aggregate amount of 25% of the amount bid.

7. The undersigned does hereby agree to commence the work encompassed under the contract within ten days after notification in writing from the Commissioner of Public Works or his authorized designee, unless a definite earlier or later start has been specified, and will complete the work fully and in every respect on or before the specified completion date; and further agrees that the County has the right to employ such combination of labor, equipment

and materials as may be required for the proper completion of the contract work and to deduct all costs from such monies as may be due the undersigned, in the event the contract work is not completed by the specified completion date.

8. The undersigned does hereby agree to comply with all relevant provisions of the Labor Laws of the State of New York, and agrees to adhere to the provisions relating to the eight-hour day and five-day week, the payments of minimum rates for labor, and the latest laws relative to payments for wages for labor on public contracts.

9. The undersigned does hereby agree to insure all persons connected with the contract work against accident, at its own expense, as prescribed by the Workmen's Compensation Law of the State of New York; and that it will be responsible for payments by itself, its subcontractors and vendors of all taxes applicable to the work, and all other payments as may be required by various laws and rules and regulations of the Federal Government, the State of New York and its political subdivisions and agencies, such payments including but not limited to the following:

   A. Federal Social Security Taxes on employees' wages.

   B. Applicable Federal Excise Taxes.

   C. New York State Unemployment Insurance and Disability Payments, based on employees' wages.

10. The undersigned does hereby agree to accept their indicated lump sum price for the total work and/or their indicated unit prices for the various items of the work as the sole basis in the determination of the value of addition to, or deletions from the specified scope of the contract work.

11. ADDENDUM RECEIPT - CONTRACT NO._____

    (The undersigned shall fill in contract number above, and the required information below.)

    The undersigned does hereby acknowledge receipt of the below listed addenda to the contract specifications:

    Addendum No._____ Dated_____

    Addendum No._____ Dated_____

    Addendum No._____ Dated_____

    Addendum No._____ Dated_____

    Addendum No._____ Dated_____

COMPLETE THIS FORM USING BLACK ONLY

PROPOSAL REQUIREMENTS

12. Bidders should not submit the entire Bid document with its bid submission. Instead, Bidders must submit ALL of the Proposal Pages. Proposal Pages are denoted by a border and are titled on the bottom as "Proposal Page __".

    Be sure that, where required, the forms have been completed and signed by a notary public.

    Proposal Page 12 must be completed by a surety company and submitted with the bid if a Performance and Payment Bond is required in accordance with the "Notice to Contractors".

13. NON-COLLUSIVE BIDDING CERTIFICATION

Made pursuant to Section 103-d of the General Municipal Law of the State of New York as amended by the Laws of 1966.

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

   1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;

   2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and

   3) No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

B. A bid shall not be considered for award nor shall any award be made where a. (1), (2) and (3), above, have not been complied with; provided however, that if any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where a. (1), (2) and (3), above, have not been complied with, the bid shall not be considered for award nor shall any award be made unless the head of the purchasing unit of the political subdivision, public department, agency or official thereof to which the bid is made, or his designee, determines that such disclosure was not added for the purpose of restricting competition."

14. The undersigned and each person signing in behalf of the undersigned hereby executes the foregoing Affirmative Action Questionnaire, Proposal, Addendum Receipt and Non-Collusive Bidding Certification.

15. The undersigned and each person signing on behalf of the undersigned hereby certifies that

the person, firm or corporation submitting this proposal as the bidder has not been found guilty of a willful violation of the New York State Labor Law for failure to pay prevailing wages and supplements, as those terms are defined by the New York State Labor Law, within the twelve (12) months immediately preceding the submission of this bid.

16. The undersigned, by submitting the Proposal Pages, acknowledges that it has read the complete bid package including any and all addenda thereto and its bid includes all of the terms and conditions set forth in the bid documents, including, but not limited to, the Notice to Contractors, General Requirements and Proposals, Contract plans/drawings (if any), Proposal Forms, Information for Bidders, General Clauses, Sample Forms and Attachments, Sample Contract and Bond, Schedule of Hourly Rates and Supplements, Technical Specifications, any Special Notices and all applicable laws, rules and regulations. The undersigned further acknowledges that by submitting this bid the above denoted items are incorporated by reference and constitute an integral part of its bid.

17. The undersigned agrees that, if it is not the Successful bidder, the Sealed List of Subcontractors submitted with its bid can be destroyed by the County. **Please check the following box if you want the Sealed List of Subcontractors returned to you.** ☐

Dated_____, 20___

_____
Legal Name of Person, Firm or Corporation

(Seal of Corporation)

_____

_____
Business Address of Person, Firm or Corporation

By_____ _____
Signature Title

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
202.19	36	CY	REMOVAL OF SUBSTRUCTURES	$ _____	_____	$ _____	_____
202.2202	1070	SF	REMOVAL OF STEEL SUPPORTED STRUCTURAL SLABS (WITH SHEARCONNECTORS) - TYPE B	$ _____	_____	$ _____	_____
202.2302	9600	SF	REMOVAL OF STEEL SUPPORTED STRUCTURAL SLABS (WITHOUT SHEARCONNECTORS) - TYPE B	$ _____	_____	$ _____	_____
203.02	200	CY	UNCLASSIFIED EXCAVATION AND DISPOSAL	$ _____	_____	$ _____	_____
203.03	1600	CY	EMBANKMENT IN PLACE	$ _____	_____	$ _____	_____
204.01	80	CY	CONTROLLED LOW STRENGTH MATERIAL (CLSM)	$ _____	_____	$ _____	_____
205.97200011	NEC	LS	TESTING, HANDLING AND DISPOSAL OF CONTAMINATED DEWATERING FLUIDS	LS		$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
206.0201	150	CY	TRENCH AND CULVERT EXCAVATION	$ _____	_____	$ _____	_____
207.22	400	SY	GEOTEXTILE DRAINAGE	$ _____	_____	$ _____	_____
209.100101	2500	SY	MULCH - TEMPORARY	$ _____	_____	$ _____	_____
209.1003	2500	SY	SEED AND MULCH - TEMPORARY	$ _____	_____	$ _____	_____
209.13	150	LF	SILT FENCE-TEMPORARY	$ _____	_____	$ _____	_____
209.1501	2000	LF	TURBIDITY CURTAIN - TEMPORARY	$ _____	_____	$ _____	_____
209.1703	80	LF	DRAINAGE STRUCTURE INLET PROTECTION, PREFABRICATED-TEMPORARY	$ _____	_____	$ _____	_____
209.20120009	500	LF	Biodegradable Bio-Fiber Rolls 12 Inches	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
209.22	300	SY	CONSTRUCTION ENTRANCE	$ _____	_____	$ _____	_____
304.10119917	120	CY	SUBBASE COURSE, TYPE 1011-2	$ _____	_____	$ _____	_____
404.098101	350	TON	9.5 F1 TOP COURSE ASPHALT, 80 SERIES COMPACTION	$ _____	_____	$ _____	_____
404.198901	5	TON	19 F9 BINDER COURSE ASPHALT, 80 SERIES COMPACTION	$ _____	_____	$ _____	_____
404.378901	70	TON	37.5 F9 BASE COURSE ASPHALT, 80 SERIES COMPACTION	$ _____	_____	$ _____	_____
404.418901	140	TON	9.5 F9 TEMPORARY TOP COURSE ASPHALT, 80 SERIES COMPACTION	$ _____	_____	$ _____	_____
404.438901	280	TON	19 F9 TEMPORARY BINDER COURSE ASPHALT, 80 SERIES COMPACTION	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
407.0102	350	GAL	DILUTED TACK COAT	$ _____	_____	$ _____	_____
490.30	3100	SY	MISCELLANEOUS COLD MILLING OF BITUMINOUS CONCRETE	$ _____	_____	$ _____	_____
502.9310	1200	LF	Sealing Longitudinal Joints - Highway Joint Sealer	$ _____	_____	$ _____	_____
520.09000010	1300	LF	SAW CUTTING ASPHALT CONCRETE	$ _____	_____	$ _____	_____
552.13	2800	SF	TEMPORARY STEEL SHEETING	$ _____	_____	$ _____	_____
555.0105	20	CY	CONCRETE FOR STRUCTURES, CLASS A	$ _____	_____	$ _____	_____
555.80020001	150	LF	CRACK REPAIR BY EPOXY INJECTION (RESTORATION)	$ _____	_____	$ _____	_____
555.81980011	500	LF	CRACK REPAIR (.125 IN/WIDER) BY INJECTION OF PORTLAND CEMENTGROUT	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
556.0202	50000	LB	EPOXY-COATED BAR REINFORCEMENT FOR STRUCTURES	$ _____	_____	$ _____	_____
557.0109	625	SY	SUPERSTRUCTURE SLAB WITH INTEGRAL WEARING SURFACE - BOTTOMFORMWORK REQUIRED - TYPE 9 FRICTION	$ _____	_____	$ _____	_____
557.30	620	SY	SIDEWALKS AND SAFETY WALKS	$ _____	_____	$ _____	_____
557.32000018	700	SF	LIGHTWEIGHT HIGH-PERFORMANCE CONCRETE FOR THIN STRUCTURAL APPLICATIONS	$ _____	_____	$ _____	_____
560.09	11300	SF	TUCK POINTING	$ _____	_____	$ _____	_____
560.10070008	11300	SF	CLEANING OF STONE MASONRY AND CONCRETE SURFACES	$ _____	_____	$ _____	_____
560.11200007	40	LF	CONSTRUCT DRY STONE WALL	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
560.13200007	100	LF	REMOVE AND RESET STONE WALL	$ _____	_____	$ _____	_____
560.40000008	3000	SF	REPAIR STONE MASONRY	$ _____	_____	$ _____	_____
564.510001	400000	LB	STRUCTURAL STEEL	$ _____	_____	$ _____	_____
565.1521	2	EACH	TYPE M.R. EXPANSION BEARING (0 TO 225 KIPS)	$ _____	_____	$ _____	_____
565.1522	4	EACH	TYPE M.R. EXPANSION BEARING (226 TO 450 KIPS)	$ _____	_____	$ _____	_____
565.1721	2	EACH	TYPE M.R. FIXED BEARING (0 TO 225 KIPS)	$ _____	_____	$ _____	_____
565.1722	2	EACH	TYPE M.R. FIXED BEARING (226 TO 450 KIPS)	$ _____	_____	$ _____	_____
568.53	630	LF	STEEL BRIDGE RAILING (TWO RAIL) WITH HANDRAIL	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
568.70	100	LF	TRANSITION BRIDGE RAILING	$		$	
570.01	NEC	LS	LEAD EXPOSURE CONTROL PLAN	LS		$	
570.02	7000	DC	MEDICAL TESTING	DC		$ 7,000	00
570.03	6500	DC	PERSONAL EXPOSURE MONITORING SAMPLE ANALYSIS	DC		$ 6,500	00
570.04	26	CW	DECONTAMINATION FACILITIES	$		$	
570.150001	NEC	LS	CLASS A CONTAINMENT FOR PAINT REMOVAL	LS		$	
571.03	1000	LB	DISPOSAL OF HAZARDOUS PAINT WASTE CONTAINING LEAD	$		$	
571.04	50	LB	DISPOSAL OF NON-HAZARDOUS INDUSTRIAL SOLID PAINT WASTE	$		$	

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
572.010001	33600	SF	STRUCTURAL STEEL PAINT SYSTEM: SHOP APPLIED	$ _____	_____	$ _____	_____
573.010001	NEC	LS	STRUCTURAL STEEL PAINTING FIELD APPLIED, TOTAL REMOVAL	LS		$ _____	_____
576.01	4	EACH	SCUPPERS (TYPE A)	$ _____	_____	$ _____	_____
581.01	11300	SF	REMOVAL OF BITUMINOUS CONCRETE OVERLAY (BRIDGE)	$ _____	_____	$ _____	_____
581.02	3500	SF	REMOVAL OF CEMENT CONCRETE OVERLAY (BRIDGE)	$ _____	_____	$ _____	_____
582.05	25	CY	REMOVAL OF STRUCTURAL CONCRETE-REPLACEMENT WITH CLASS ACONCRETE	$ _____	_____	$ _____	_____
582.06	100	SF	REMOVAL OF STRUCTURAL CONCRETE - REPLACEMENT WITH CLASSD CONCRETE	$ _____	_____	$ _____	_____

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ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
582.07	50	SF	REMOVAL OF STRUCTURAL CONCRETE - REPLACEMENT WITH VERTICALAND OVERHEAD PATCHING MATERIAL	$ _____	_____	$ _____	_____
584.310908	240	SY	OVERLAY CONCRETE - CLASS DP - TYPE 9 FRICTION	$ _____	_____	$ _____	_____
585.01	10	EACH	STRUCTURAL LIFTING OPERATIONS - TYPE A	$ _____	_____	$ _____	_____
586.05	4400	EACH	REMOVAL OF RIVETS - REPLACEMENT WITH HIGH STRENGTH BOLTS	$ _____	_____	$ _____	_____
586.10	600	EACH	FIELD DRILL HOLES IN EXISTING STRUCTURAL STEEL	$ _____	_____	$ _____	_____
589.010001	267000	LB	REMOVAL OF EXISTING STEEL	$ _____	_____	$ _____	_____
589.520001	10	EACH	REMOVAL OF EXISTING STEEL	$ _____	_____	$ _____	_____

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ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
594.11000010	140	LF	FIBERGLASS REINFORCED PLASTIC (FRP) COMPOSITE LUMBERFOR BRIDGE FENDER	$ _____	_____	$ _____	_____
595.98200018	16600	SF	SPRAY-APPLIED, WATERPROOFING MEMBRANE	$ _____	_____	$ _____	_____
596.01	100	SF	OPEN STEEL FLOOR	$ _____	_____	$ _____	_____
596.122010WE	1600	SF	STEEL GRID DECK	$ _____	_____	$ _____	_____
599.061001WE	NEC	LS	REHABILITATE BUILDING INTERIOR	LS		$ _____	_____
599.061201WE	NEC	LS	REHABILITATE SPAN DRIVE MANCHINERY	LS		$ _____	_____
599.061202WE	NEC	LS	REFURBISH TRUNIONS	LS		$ _____	_____
599.061203WE	NEC	LS	MACHINERY FIELD PAINTING	LS		$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
599.061204WE	NEC	LS	SERVICE REDUCERS	LS		$	
599.061205WE	NEC	LS	REPLACE SPAN LOCKS AND MISCELLANEOUS REPAIRS	LS		$	
599.061301WE	NEC	LS	BRIDGE BALANCE	LS		$	
599.061701WE	NEC	LS	CONTROL HOUSE HVAC	LS		$	
599.061801WE	NEC	LS	CONTROL HOUSE PLUMBING	LS		$	
599.061802WE	NEC	LS	COUNTERWEIGHT PIT DEWATERING	LS		$	
599.063000WE	NEC	LS	BRIDGE ELECTRICAL AND CONTROL SYSTEM	LS		$	
599.064000WE	NEC	LS	MOVABLE BRIDGE ELECTRICAL TESTING	LS		$	

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
599.142500WE	NEC	LS	MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS	LS		$ _____	_____
599.142600WE	NEC	LS	MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS INSTALLATION	LS		$ _____	_____
599.20200010	NEC	LS	REMOVAL OF EXISTING WARNING GATES AND BIKEWAY GATES	LS		$ _____	_____
604.07210110	8	EACH	RESETTING EXISTING DRAINAGE FRAMES ON EXISTING DRAINAGE STRUCTURES	$ _____	_____	$ _____	_____
605.16010008	100	LF	NON-PERFORATED PVC PIPE, 4" DIAMETER PIPE	$ _____	_____	$ _____	_____
607.0512	200	LF	VINYL COATED STEEL CHAIN-LINK FENCE ON PLASTIC COATED FRAMEWITH TOP RAIL 6 FEET HIGH	$ _____	_____	$ _____	_____
607.99870011	200	LF	REMOVE EXISTING CHAIN-LINK FENCE	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
608.0101	10	CY	CONCRETE SIDEWALKS AND DRIVEWAYS	$ _____	_____	$ _____	_____
608.01050109	1	EACH	CURB RAMP CONFIGURATION TYPE 1	$ _____	_____	$ _____	_____
608.01050209	2	EACH	CURB RAMP CONFIGURATION TYPE 2	$ _____	_____	$ _____	_____
608.01050309	5	EACH	CURB RAMP CONFIGURATION TYPE 3	$ _____	_____	$ _____	_____
608.01051409	1	EACH	CURB RAMP CONFIGURATION TYPE 14	$ _____	_____	$ _____	_____
608.020102	220	TON	ASPHALT SIDEWALKS, DRIVEWAYS AND BICYCLE PATHS,AND VEGETATION CONTROL STRIPS	$ _____	_____	$ _____	_____
609.0401	750	LF	CAST-IN-PLACE CONCRETE CURB TYPE VF6	$ _____	_____	$ _____	_____
609.06000008	1400	LF	CURB REMOVAL	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
609.40000015	20	EACH	REINFORCED PRECAST CONCRETE PARKING BLOCKS	$ _____	_____	$ _____	_____
610.1402	350	CY	TOPSOIL - ROADSIDE	$ _____	_____	$ _____	_____
610.1601	250	SY	TURF ESTABLISHMENT - ROADSIDE	$ _____	_____	$ _____	_____
610.1602	2500	SY	TURF ESTABLISHMENT - LAWNS	$ _____	_____	$ _____	_____
610.18	2500	SY	SODDING	$ _____	_____	$ _____	_____
611.0161	3	EACH	PLANTING - MAJOR DECIDUOUS TREES - 2 1/2 INCH CALIPER BALL& BURLAP, FIELD POTTED OR FIELD BOXED	$ _____	_____	$ _____	_____
611.0171	3	EACH	PLANTING - MAJOR DECIDUOUS TREES - 3 INCH CALIPER BALL& BURLAP, FIELD POTTED OR FIELD BOXED	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
619.01	NEC	LS	BASIC WORK ZONE TRAFFIC CONTROL	LS		$ _____	_____
619.04	6	EACH	TYPE III CONSTRUCTION BARRICADE	$ _____	_____	$ _____	_____
619.0501	NEC	LS	TEMPORARY STRUCTURES AND APPROACHES NO 1	LS		$ _____	_____
619.07010001	20	EACH	PLASTIC CONSTRUCTION DRUMS (EACH)	$ _____	_____	$ _____	_____
619.0901	3400	LF	TEMPORARY PAVEMENT MARKINGS STRIPES (TRAFFIC PAINT)	$ _____	_____	$ _____	_____
619.1714	100	LF	Temporary Positive Barrier - Category 4 (Pinning Permitted)	$ _____	_____	$ _____	_____
619.1716	400	LF	Temporary Positive Barrier - Category 6 (Pinning Required)	$ _____	_____	$ _____	_____
620.05	250	CY	STONE FILLING (HEAVY)	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
620.0801	120	CY	BEDDING MATERIAL, TYPE 1	$ _____	_____	$ _____	_____
621.04	8	EACH	CLEANING DRAINAGE STRUCTURES	$ _____	_____	$ _____	_____
623.11	300	CY	CRUSHED GRAVEL (IN-PLACE MEASURE)	$ _____	_____	$ _____	_____
634.80210001	650	LF	REFURBISH ORNAMENTAL RAILING SYSTEM	$ _____	_____	$ _____	_____
634.99020017	NEC	LS	VIBRATION MONITORING (NONBLASTING)	LS		$ _____	_____
639.22010011	NEC	LS	CPM PROGRESS SCHEDULE - TYPE 2B	LS		$ _____	_____
645.52020110	40	SF	Ground-Mount Sign Panel 30 SF or Less High Visb Sh Non-Retroreflect Sheet, Powder Coat Stiffener, Bracket, Misc Hrdware	$ _____	_____	$ _____	_____
645.81	8	EACH	TYPE A SIGN POSTS	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
647.51	7	EACH	REMOVE AND DISPOSE SIGN PANEL, SIGN PANEL ASSEMBLY SIZE I(UNDER 30 SQUARE FEET)	$ _____	_____	$ _____	_____
648.06	500	LF	DRILL HOLE, 4 INCH DIAMETER 0 TO 50 FOOT DEPTH RANGE	$ _____	_____	$ _____	_____
648.15	200	LF	ROCK CORE DRILLING NX	$ _____	_____	$ _____	_____
648.17	3	EACH	FURNISHING EQUIPMENT FOR MAKING BORINGS	$ _____	_____	$ _____	_____
648.19	6	EACH	FURNISHING EQUIPMENT FOR MAKING BORINGS ON WATER USINGSTATIONARY PLATFORM	$ _____	_____	$ _____	_____
655.05020008	1	EACH	WATERTIGHT SANITARY MANHOLE FRAMES AND COVERS (CASTINGS)	$ _____	_____	$ _____	_____
660.93000008	2	EACH	FURNISH AND INSTALL SANITARY SEWER	$ _____	_____	$ _____	_____
660.97020011	NEC	LS	SANITARY SEWER CLEANOUTS	LS		$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
660.97100010	1	LF	PRECAST SANITARY SEWER MANHOLE	$ _____	_____	$ _____	_____
663.0604	10	LF	COPPER WATER SERVICE PIPE 1"	$ _____	_____	$ _____	_____
663.2504	1	EACH	WATER SERVICE CONNECTION, 1"	$ _____	_____	$ _____	_____
663.2604	1	EACH	CURB STOP & CURB BOX, 1"	$ _____	_____	$ _____	_____
663.51000004	1	EACH	FURNISH AND INSTALL NEW WATER VALVE BOX	$ _____	_____	$ _____	_____
664.01060004	320	LF	DUCTILE IRON SEWER PIPE & FITTINGS, 6"	$ _____	_____	$ _____	_____
664.40480006	10	LF	PRECAST SANITARY SEWER MANHOLE (48 INCH DIA.)	$ _____	_____	$ _____	_____
670.60	1	EACH	PHOTOELECTRIC CONTROLS	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
670.81	20	EACH	REMOVE AND DISPOSE OF LAMPPOST ASSEMBLY	$ _____	_____	$ _____	_____
680.01040015	NEC	LS	TRAFFIC SIGNAL SYSTEM	LS		$ _____	_____
680.10000007	3	EACH	INSTALL TRAFFIC SIGNAL POLE ALL SIZES	$ _____	_____	$ _____	_____
680.621630	1	EACH	TRAFFIC SIGNAL POLE, MAST ARM, 16 FEET MOUNTING HEIGHT,30 FEET ARM LENGTH	$ _____	_____	$ _____	_____
680.6712	2	EACH	TRAFFIC SIGNAL POLE-POST TOP MOUNT 12 FEET MOUNTING HEIGHT	$ _____	_____	$ _____	_____
680.79300010	4	EACH	REMOVE TRAFFIC SIGNAL HEAD OR PEDESTRIAN SIGNAL HEAD	$ _____	_____	$ _____	_____
680.810101	4	EACH	TRAFFIC SIGNAL MODULE - 12 INCH, RED BALL, LED	$ _____	_____	$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
680.810103	4	EACH	TRAFFIC SIGNAL MODULE - 12 INCH, YELLOW BALL, LED	$ _____	_____	$ _____	_____
680.810105	4	EACH	TRAFFIC SIGNAL MODULE - 12 INCH, GREEN BALL, LED	$ _____	_____	$ _____	_____
680.810107	4	EACH	TRAFFIC SIGNAL SECTION - TYPE I, 12 INCH	$ _____	_____	$ _____	_____
680.810308	4	EACH	INSTALL BALL/ARROW LED TRAFFIC SIGNAL MODULE	$ _____	_____	$ _____	_____
680.8111	2	EACH	TRAFFIC SIGNAL BRACKET ASSEMBLY - 1 WAY	$ _____	_____	$ _____	_____
680.8220	2	EACH	FLASHING BEACON SIGN ASSEMBLY	$ _____	_____	$ _____	_____
680.82250301	4	EACH	REMOVE STEEL EMBEDDED TRAFFIC SIGNAL POLE	$ _____	_____	$ _____	_____
683.090700WE	NEC	LS	MOVABLE BRIDGE STANDBY GENERATOR	LS		$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
685.07200110	1200	LF	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS(WET NIGHT VISIBILITY SPHERES)	$ _____	_____	$ _____	_____
685.07200410	350	LF	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES (CROSS HATCHING)20 MILS THICK (WET NIGHT VISIBILITY SPHERES)	$ _____	_____	$ _____	_____
685.07200510	300	LF	WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES (SPECIAL MARKINGS) 20 MILS THICK (WET NIGHT VISIBILITY SPHERES)	$ _____	_____	$ _____	_____
685.07200610	1700	LF	YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS(WET NIGHT VISIBILITY SPHERES)	$ _____	_____	$ _____	_____
			Subtotal of All Items Above:			$ _____	_____
699.020001WE	NEC	LS	MOBILIZATION (Must not exceed 2.00% of Subtotal Shown Above)			$ _____	_____

CONTRACT NO. **20-517**

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
699.040002WE	NEC	LS	CONTRACT BONDS AND INSURANCE (Must not exceed 3.00% of Subtotal Shown Above/Previous Page)			$	
800.000000WE	8000000	DC	MISCELLANEOUS ADDITIONAL WORK			$ 8,000,000	00
851.000000WE	250000	DC	TESTING OF MATERIALS AND FIELD TESTING EQUIPMENT			$ 250,000	00

	DOLLARS	CTS.
Gross Sum of Total Bid Written in Figures:	$	

CONTRACTOR: _____

ADDRESS: _____

_____

SIGNED BY AND DATE: _____

CONTRACTOR'S ACKNOWLEDGMENT

(If Corporate)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____ day of _____, 20___, before me personally came _____ _____to me known and known to me to be the_____ _____of_____the corporation described in and which executed the within instrument, who being by me duly sworn did depose and say that he the said_ _____resides at_____ _____and that he is_____of said corporation and knows the corporate seal of the said corporation; that the seal affixed to the within instrument is such corporate seal and 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

CONTRACTOR'S ACKNOWLEDGMENT

(If Individual)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____day of _____, 20___, before me personally came _____ _____to me known, and known to me to be the same person described in and who executed the within instrument and he duly acknowledged to me that he executed the same for the purpose herein mentioned and, if operating under the trade name, that the certificate required by the New York State General Business Law Section 130 has been filed with the County Clerk of Westchester County.

_____
Notary Public

CONTRACTOR'S ACKNOWLEDGMENT

(If Co-Partnership)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____day of _____, 20___, before me personally came _____ _____ to me known, and known to me to be a member of the firm of _____ and the person described in, and who executed the within instrument in behalf of said firm, and he acknowledged to me that he executed the same in behalf of, and as the act of said firm for the purposes herein mentioned and that the certificate required by the New York State General Business Law Section 130 has been filed with the County Clerk of Westchester County.

_____
Notary Public

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACTOR'S ACKNOWLEDGMENT

(If Corporation/Sole Officer)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 20__, before me

personally came _____ to me known and
(Name)

known to me to be the _____
(Title)

of _____, the corporation described in and which
(Name of Corporation)

executed the within instrument, who being by me duly sworn did depose and say that he/she,

resides at _____

and that he/she signed the within instrument, on behalf of said corporation, in his/her capacity

as the _____ and sole officer and director of said corporation
(Title)

and that he/she owns all the issued and outstanding capital stock of said corporation.

_____
Notary Public

COMPLETE THIS FORM USING BLACK INK ONLY

LIMITED LIABILITY COMPANY ACKNOWLEDGMENT

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 20__, before me

personally came _____ to me known to be the individual
(Name of individual who signed agreement)

who executed the foregoing instrument, and who, being duly sworn by me, did depose and say that

(s)he is (the)(a) _____ of_____,
(member)(manager) *(name of limited liability company)*

a _____ limited liability company, and that (s)he has authority
(name of state)

to sign the same, and acknowledged that (s)he executed the same as the act and deed of said limited liability company.

Sworn to before me this ____ day
of _____, 20__

_____
Notary Public

My Commission Expires on: _____

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF AUTHORITY

I, _____

(*Officer other than officer executing proposed documents*)

certify that I am _____ of the

(*Title*)

_____

(*Name of Contractor*)

(the "Contractor"), a corporation duly organized and in good standing under the

_____

(*Law under which organized, e.g., the New York Business Corporation Law*)

named in the foregoing agreement; that _____

(*Person executing proposal documents*)

who signed said agreement on behalf of the Contractor was, at the time of execution the

_____ of the Contractor; that said agreement was

(*Title of such person*)

duly signed for and in behalf of said Contractor by authority of its Board of Directors, thereunto duly organized, and that such authority is in full force and effect at the date hereof.

_____

(*Signature*)

(SEAL)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of, _____, 20___, before me personally came _____ to me known, and known to me to be the _____ of _____, the Corporation described in and which executed the above certificate, who being by me duly sworn did depose and say that he, the said _____ resides at _____ and that he is _____ _____ of said Corporation and knows the Corporate Seal of the said Corporation; that the seal affixed to the above certificate is such Corporate Seal and 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

COMPLETE THIS FORM IN BLACK INK ONLY

CERTIFICATE OF AUTHORITY-LIMITED LIABILITY COMPANY

I, _____,
(member or manager other than person executing the agreement)

certify that I am a _____ of _____
(member/manager) *(Name of Limited Liability Company)*

(the "LLC") duly organized under the Laws of the State of _____; that
(Name of State)

_____who signed said agreement on behalf of the LLC.
(Person Executing Agreement)

was, at the time of execution, a manager of the LLC; that said Contract was duly signed for and on behalf of said LLC and as the act of said LLC for the purposes herein mentioned.

_____
(Signature)

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

On this _____ day of _____, 20___, before me personally came _____, to me known, and known to me to be the _____
(name of member/manager) *(member/manager)*
described in and who executed the above certificate, who being be me duly sworn did depose and say that he resides at _____, and he is a (member/manager) of said LLC; that he is duly authorized to execute said certificate on behalf of said LLC, and that he signed his name thereto pursuant to such authority.

_____
Notary Public *County*

My Commission Expires on:_____

COMPLETE THIS FORM USING BLACK INK ONLY

Required for all Bids over $100,000 where a Performance & Payment Bond is Required in accordance with the "Notice to Contractors"

CONTRACT NO. _____

BID BOND AND CONSENT OF SURETY

KNOW ALL PERSONS BY THESE PRESENTS, That _____
(Name of Contractor)

_____
(Address)

(hereinafter called the "Principal") and the _____ a corporation created and existing under the laws of the State of _____, having its principal office at_____ (hereinafter called the "Surety"),
(PRINT FULL ADDRESS OF SURETY)

are held and firmly bound unto the County of Westchester (hereinafter called the "Obligee"), in the full just sum of *Twenty-Five (25%) Percent of the Attached Bid*, 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 themselves (himself/herself, itself), their (his/her, its) heirs, executors and administrators, successors and assigns, and the said Surety binds itself, its successors and assigns jointly and severally, firmly by these presents:

WHEREAS, the said Principal has submitted to the County of Westchester, New York, a proposal/bid for Contract Number: _____
Project Title: _____
_____ and

WHEREAS, under the terms of the Laws of the State of New York as above indicated, the said Principal has filed or intends to file this bond to guarantee that the Principal will execute all required contract documents, furnish all required insurance and furnish such Performance and Payment Bonds or other bonds as may be required in accordance with the terms of the Principal's said proposal/bid.

NOW, THEREFORE, the Surety agrees:

(i) if the Contract for which the preceding estimate and proposal is made, is awarded to the Bidder by the County, the Surety shall become bound as Surety and guarantor for the faithful performance of the Contract and shall execute and deliver a Performance & Payment Bond, in a form acceptable to the County, in the amount of 100% of the total Contract price, or such other amount as may be specified in the Bid documents, and shall execute the Contract as party of the third part when required to do so by the Board of Acquisition and Contract of the County; and

(ii) if the Bidder shall, upon award of the Contract to the Bidder, fail or refuse to execute the Contract and furnish the necessary bonds and insurance certificates, the Surety shall, on demand by the County, pay to the County the difference between the amount bid and the amount for which such contract is thereafter awarded, together with the cost to the County of reletting said Contract, up to the maximum aggregate amount of this bond.

(iii) the condition of the foregoing obligation is such, that if the said Principal shall promptly execute and submit, and the County shall accept, all required contract documents including insurance and such Performance and Payment Bond or other bonds, all as may be required in accordance with the terms of the Principal's said bid/proposal, then this obligation shall be null and void, otherwise to remain in full force and virtue.

The Surety, for value received, the receipt of which is hereby acknowledged by the Surety, hereby stipulates and agrees that the obligation of the Surety and of its bond shall remain absolute and shall be in no way impaired, affected or discharged by an extension of time, mutually agreed to by the County and the Bidder, within which the County may award said Contract, and the Surety hereby waives notice of any such extension.

IN TESTIMONY WHEREOF, the said Principal has hereunto set his/her (their, its) hand and the said Surety has caused this instrument to be signed by its duly authorized officer this_____ day of _____ 200__.

Signed and delivered this ____ day of _____ 20____ in the presence of:

_____
(Print Name of Contractor)

_____ Principal
(Signature)

_____
(Title of Authorized Officer)

_____
(Print Name of Surety)

By _____ Surety
(Signature)

_____
(Title of Authorized Officer)

(The Surety Company shall append a single copy of a statement of its financial condition, a copy of the resolution authorizing the execution of Bonds by officers of the Surety Company, Power of Attorney, Surety Acknowledgment.)

AFFIRMATIVE ACTION PROGRAM REQUIREMENT

Affirmative Action Program

An approved Affirmative Action Plan shall be required in all contracts for public work where the awarded contract amount exceeds $50,000 or more than fourteen (14) persons are employed by the Contractor and/or his subcontractors.

Does the Contractor participate in an approved Affirmative Action Program? Yes [ ] No [ ]

If Yes, give name of Program: _____

_____

If No, how many employees (total) does the Contractor employ. Please also include in your count the number of employees the Contractor and its Subcontractors expect to use on this project: _____

An approved Affirmative Action Program shall mean a plan approved or adopted by Westchester County including but not limited to, the Home-Town Plan, the Recruitment Training Program or any other program approved or meeting the requirements of the State or Federal government.

The "Monthly Employment Utilization Report" of the Sample Forms, shall be filled out by the Contractor and/or Subcontractor(s) who are required to have an Affirmative Action Program, prior to the start of the work.

Before any subcontractor is approved for use on this contract it will have to complete and submit the "Affirmative Action Program Requirement- Subcontractors" form of the Sample Forms.

COMPLETE THIS FORM USING BLACK INK ONLY

APPRENTICESHIP TRAINING PROGRAM REQUIREMENT

Apprenticeship Training Program

An approved Apprenticeship Training Program shall be required in all contracts for public work where the awarded contract amount exceeds $50,000. and more than fourteen (14) persons are employed by the Contractor or Subcontractor(s).

Will the Contractor utilize apprentices for this Contract? Yes [ ] No [ ]

If Contractor Yes, do the apprentices participate in an approved Apprenticeship Training Program? Yes [ ] No [ ]

If Contractor Yes, give the name of the Program: _____

_____

Will the Subcontractor(s) utilize apprentices for this Contract? Yes [ ] No [ ]

If Subcontractor(s) Yes, do the apprentices participate in an approved Apprenticeship Training Program? Yes [ ] No [ ]

If Subcontractor(s) Yes, give the name of the Program: _____

_____

AN APPROVED APPRENTICESHIP TRAINING PROGRAM SHALL MEAN A NEW YORK STATE REGISTERED APPRENTICESHIP TRAINING PROGRAM AS DEFINED UNDER THE NEW YORK STATE LABOR LAW.

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE

(TO BE COMPLETED BY AN ELECTRICAL BIDDER ONLY)

_____, being duly sworn
(Name)

deposes and says that the following statements are true:

(1) I am the _____ of the
(Title)

_____, the bidder named on the
(Name of Contractor)

bid proposal, and I have read and am familiar with: a) the electrical license requirements contained in the Information for Bidders of the bid, b) Chapter 277 Article XVII of the Laws of Westchester County entitled Electrical Licensing Board and the Licensing of Master Electricians, and c) the Westchester County Electrical Licensing Board Rules and Regulations.

(2) I am familiar with, and this bid is being submitted in compliance with, the Westchester County Electrical Licensing Board Rules and Regulations, in particular No. 11, which states as follows:

> No individual holding a Master Electrician's License shall lend such License to any person or allow any other person to carry on, engage in, or labor at the business as defined herein of installing, removing, altering, testing, replacing, or repairing electrical systems. A violation of this section by any person holding a License shall be sufficient cause for revocation of such License.
>
> However, nothing herein shall be construed to prohibit the use of a License by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that fifty-one (51) percent or more of the control of the voting capital stock of such partnership, corporation, or other business association is owned by one (1) or more holders of a Westchester County Master Electrical License and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such License holder or holders.

(3) That, as of this date, the bidder submitting the bid possesses the applicable valid Master/"Special" Electrician's license issued by the Westchester County Electrical Licensing Board; that this License is being used in compliance with the Laws of Westchester County and Westchester County Electrical Licensing Board Rules and Regulations; and **I have provided a copy of such license with the sealed bid proposal**.

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE (Continued)

(TO BE COMPLETED BY AN ELECTRICAL BIDDER ONLY)

(4) That all electrical work shall be performed in accordance with the requirements of Chapter 277 Article XVII of the Laws of Westchester County entitled Electrical Licensing Board and the Licensing of Master Electricians and the Westchester County Electrical Licensing Board Rules and Regulations.

(5) That I make this statement in connection with the submission of the bid as proof of the required electrical license, knowing that this statement will be relied upon by the County in the evaluation of that bid.

_____

Signature

Sworn to before me
this _____ day of _____

_____

License No.

_____
Notary Public - State of New York

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE

(TO BE COMPLETED BY A PLUMBING BIDDER ONLY)

_____, being duly sworn
(Name)

deposes and says that the following statements are true:

(1) I am the _____ of the
(Title)

_____, the bidder named on the
(Name of Contractor)

bid proposal, and I have read and am familiar with: a) the plumbing license requirements contained in the Information for Bidders of the bid, b) Chapter 277 Article XV of the Laws of Westchester County entitled Westchester County Board of Plumbing Examiners and County-wide Plumbing License, and c) the Westchester County Board of Plumbing Examiners Rules and Regulations.

(2) I am familiar with, and this bid is being submitted in compliance with, Section 277.509A of Article XV of Chapter 277 of the Laws of Westchester County, which states as follows:

> A. No holder of a license or certification issued under this article shall authorize, consent to or permit the use of his or her license or certification by or on behalf of any other person. No person who has not qualified or obtained a license or certification under this article shall represent himself or herself to the public as holder of a license or certification issued under this article, either directly, by means of signs, sign cards metal plates or stationery, or indirectly in any other manner whatsoever. However, nothing herein shall be construed to prohibit the use of a license by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that 51 percent or more of the control of the voting capital stock of such partnership, corporation or other business association is owned by one or more holders of a Westchester County master plumbing license and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such license holder or holders.

(3) That, as of this date, the bidder submitting the bid possesses a valid Master Plumber's license issued by the Westchester County Board of Plumbing Examiners; that this License is being used in compliance with the Laws of Westchester County and the Westchester County Board of Plumbing Examiners Rules and Regulations; and **I have provided a copy of such license with the sealed bid proposal**.

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE (Continued)

(TO BE COMPLETED BY A PLUMBING BIDDER ONLY)

(4) That all plumbing work shall be performed in accordance with the requirements of Chapter 277, Article XV of the Laws of Westchester County entitled Westchester County Board of Plumbing Examiners and County-wide Plumbing License, and the Westchester County Board of Plumbing Examiners Rules and Regulations.

(5) That I make this statement in connection with the submission of the bid as proof of the required plumbing license, knowing that this statement will be relied upon by the County in the evaluation of that bid.

_____

Signature

Sworn to before me
this _____ day of _____

_____

License No.

_____
Notary Public - State of New York

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE

(TO BE COMPLETED BY A HAULING BIDDER OR SUBCONTRACTOR ONLY)

_____, being duly sworn
(Name)

deposes and says that the following statements are true:

(1) I am the _____ of the
(Title)

_____, the bidder/subcontractor (circle one)
(Name of Contractor)

named on the foregoing bid proposal, and I have read and am familiar with the hauling license requirements contained in the Information for Bidders of the foregoing bid.

(2) That, as of this date, the bidder submitting the foregoing bid/subcontractor of the bidder submitting the foregoing bid (circle one) possesses a valid _____ license
(License type, i.e. Class "A")
issued by the Westchester County Solid Waste Commission.

(3) That all hauling work shall be performed in accordance with the requirements of Chapter 826-a of the Laws of Westchester County.

(4) That I make this statement in connection with the submission of the foregoing bid as proof of the required hauling license, knowing that this statement will be relied upon by the County in the evaluation of that bid.

_____

Signature

Sworn to before me
this _____ day of _____

_____

License No.

_____
Notary Public - State of New York

COMPLETE THIS FORM USING BLACK INK ONLY

STORMWATER POLLUTION PREVENTION CERTIFICATION

I certify under penalty of law that I understand and agree to comply with the terms and conditions of the Stormwater Pollution Prevention Plan ("SPPP") for the construction site identified in such SPPP as a condition of authorization to discharge stormwater. I also understand the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and it is unlawful for any person to contribute to a violation of water quality standards.

_____

Signature

Sworn to before me
This _____day of _____, 200_.

_____

Notary Public – State of New York, County of _____
My Commission Expires on _____.

This Certification will also have to be signed by your subcontractors. *Additional copies of this form can be acquired from the Department of Public Works.*

COMPLETE THIS FORM USING BLACK INK ONLY

PREVAILING WAGE RATES AND SUPPLEMENTS

Compliance with the New York State Construction (Article 1, Section 17) and the New York State Labor Law (Section 220)

Is your firm in full compliance with the New York State Labor Law?
(Please check one)

Yes _____ No _____

Are the wage supplements paid into a Federally approved program?
(Please check one)

Yes _____ No _____

If Yes, please indicate which program:

_____

_____

_____

If No, please indicate how the supplements are being paid:

_____

_____

_____

Yes, I have read and understand the terms of this Contract and the laws of this Agreement:

_____ Date: _____
Signature

_____ Date: _____
Notary Public

COMPLETE THIS FORM USING BLACK INK ONLY

MINORITY/WOMEN BUSINESS ENTERPRISE PROGRAM QUESTIONNAIRE
QUESTIONNAIRE REGARDING BUSINESS ENTERPRISES
OWNED AND CONTROLLED BY WOMEN OR PERSONS OF COLOR

As part of the County's program to encourage the meaningful and significant participation of business enterprises owned and controlled by persons of color or women in County contracts, and in furtherance of Section 308.01 of the Laws of Westchester County, completion of this form is required.

A "business enterprise owned and controlled by women or persons of color" means a business enterprise, including a sole proprietorship, limited liability partnership, partnership, limited liability corporation, or corporation, that either:

1.) meets the following requirements:
   a. is at least 51% owned by one or more persons of color or women;
   b. is an enterprise in which such ownership by persons of color or women is real, substantial and continuing;
   c. is an enterprise in which such ownership interest by persons of color or women has and exercises the authority to control and operate, independently, the day-to-day business decisions of the enterprise; and
   d. is an enterprise authorized to do business in this state which is independently owned and operated.

2.) is a business enterprise certified as a minority business enterprise ("MBE") or women business enterprise ("WBE") pursuant to Article 15-a of the New York State Executive Law and the implementing regulations, 9 New York Code of Rules and Regulations subtitle N Part 540 et seq., **OR**

3.) is a business enterprise certified as a small disadvantaged business concern pursuant to the Small Business Act, 15 U.S.C. 631 et seq., and the relevant provisions of the Code of Federal Regulations as amended.

Please note that the term "persons of color," as used in this form, means a United States citizen or permanent resident alien who is and can demonstrate membership of one of the following groups:

(a) Black persons having origins in any of the Black African racial groups;
(b) Hispanic persons of Mexican, Puerto Rican, Dominican, Cuban, Central or South American descent of either Indian or Hispanic origin regardless of race;
(c) Native American or Alaskan native persons having origins in any of the original peoples of North America; or
(d) Asian or Pacific Islander persons having origins in any of the Far East countries, South East Asia, the Indian subcontinent or the Pacific Islands.

1. Are you a business enterprise owned and controlled by women or persons of color in accordance with the standards listed above?

_____ No

_____ Yes

Please note: If you answered "yes" based upon certification by New York State and/or the Federal government, official documentation of the certification must be attached.

2. If you answered "Yes" above, please check off below whether your business enterprise is owned and controlled by women, persons of color, or both.

_____ Women

_____ Persons of Color (*please check off below all that apply)*

_____ Black persons having origins in any of the Black African racial groups
_____ Hispanic persons of Mexican, Puerto Rican, Dominican, Cuban, Central or South American descent of either Indian or Hispanic origin regardless of race
_____ Native American or Alaskan native persons having origins in any of the original peoples of North America
_____ Asian or Pacific Islander persons having origins in any of the Far East countries, South East Asia, the Indian sub-continent or the Pacific Islands

Name of Business Enterprise: _____

Address: _____

_____

Name and Title of person completing questionnaire: _____

_____

Signature: _____

_____ _____

Notary Public Date

CONTRACTOR'S DISCLOSURE STATEMENT

Instructions:

The County of Westchester, in order to insure that it employs responsible contractors for its major construction projects, requires all bidders for construction contracts (which includes reconstruction and repair) with an estimated value of One Hundred Thousand ($100,000.00) or more Dollars to answer completely and swear to the questions below. If a Contractor Disclosure Statement has been included with this bid specification, then the County has determined that it is applicable to this bid. All subcontractors whose contract has a value of One Hundred Thousand ($100,000.00) or more Dollars must also submit a Contractor Disclosure Statement.

Please read the questions carefully and answer them completely. Before you answer these questions, please read the definitions of terms used in these questions. While you may contact the Department of Public Works if you have questions about this form, the County cannot provide you with any legal advice for which you must contact your own lawyer. **FAILURE TO COMPLETE THIS CONTRACTOR DISCLOSURE STATEMENT IN GOOD FAITH MAY RESULT IN THE REJECTION OF YOUR BID**.

If you have previously filled out a Contractor Disclosure Statement for another County bid and only some but not all of your responses have changed, attach a copy of the prior Contractor Disclosure Statement and check #2 below indicating changes only and only answer those questions which have changed since you last filled out the Contractor Disclosure Statement.

If you have previously completed a Contractor Disclosure Statement for another County bid and nothing has changed in your responses to the questions, then check #3 and fill out the attached No Change Affidavit. Attach a copy of the prior Contractor Disclosure Statement to the No Change Affidavit.

NOTE IF THE SPACES PROVIDED FOR ANSWERS ARE NOT SUFFICIENT FOR YOU TO COMPLETE YOUR ANSWER TO A PARTICULAR QUESTION, THEN ATTACH ADDITIONAL PAGES TO THIS CONTRACTOR DISCLOSURE STATEMENT WHICH INDICATE THE NUMBER OF THE QUESTION THAT YOU ARE COMPLETING THE ANSWER FOR.

ALSO DO NOT LEAVE ANY ANSWERS BLANK. IF A QUESTION IS NOT APPLICABLE, ANSWER - N/A – AND OFFER A BRIEF EXPLANATION AS TO WHY THE QUESTION DOES NOT APPLY.

Definitions:

Affiliate – is another Business Entity in which the Contractor or one or more of the Principals of the Contractor has an ownership interest of more than fifty (50%) percent. An Affiliate is also another Business Entity in which the Parent of the Contractor owns more than fifty (50%) percent of that other Business Entity.

Agency or Government Agency – is any Federal, State, City or other local agency including, but not limited to, departments, offices, quasi-public agencies, public authorities and

corporations, boards of education and higher education, public development corporations and local development corporations.

Assignee – is a person or Business Entity to whom an assignment (e.g., a transfer to another of any property, real or personal, including a transfer of any rights in such property) is made.

Business Address – is the location of principal executive offices and is also the primary place of business in Westchester County, if different.

Business Entity – is any profit-seeking business including, but not limited to, corporations, limited and general partnerships, joint ventures and individual (sole) proprietorships.

Contract – is any binding agreement with any Government Agency or other Business Entity for the provision of goods, or services including, but not limited to, construction.

Contractor – is the Business Entity submitting this Contractor Disclosure Statement.

Contractor Disclosure Statement – is this document.

Control – A Business Entity controls another Business Entity when:

- The controlling Business Entity owns more than fifty (50%) percent of the controlled Business Entity, or
- The controlling Business Entity directs or has the right to direct daily operations of the controlled Business Entity, or
- The same person is a Principal in both businesses and directs the daily operations of the controlled Business Entity.

Investigations – is any official inquiry by any Government Agency, with the exception of background investigations for employment.

Officer – is any individual who serves in the function of chief executive officer, chief financial officer or chief operating officer of the Business Entity by whatever titles known.

Parent – is a Business Entity which owns more than fifty (50%) percent of another Business Entity.

Principal – is an individual, partnership, joint venture or corporation which holds ten (10%) percent or more ownership interest in the Business Entity.

Partner – shall mean a person or Business Entity that has a joint ownership in a particular business, but the ownership interest is not as a shareholder of a corporation.

Successor – is a person or Business Entity that takes the place that another has left. With reference to a corporation, a successor shall mean another corporation which, through amalgamation, consolidation, or other legal succession, becomes invested with the rights and assumes the burdens of the first corporation.

CONTRACTOR'S DISCLOSURE STATEMENT

CONTRACT NO.:_____

☐ Check if Subcontractor

Type Of Submission

(*Put a X or √next to the applicable type of submission*)

1. **Fully Completed Contractor Disclosure Statement** _____
(*Sign Oath on last page of Disclosure Statement*)

2. **Changes Only Contractor Disclosure Statement** _____
(*Attach copy of previously filed Contractor Disclosure Statement that you are amending. Denote any changes on the following Contractor Disclosure Statement. Sign Oath on last page of this Disclosure Statement*)

3. **No Change** _____
(*Fill out "No Change Affidavit" [below] and attach copy of previously filed Contractor Disclosure Statement*)

NO CHANGE AFFIDAVIT

I swear that the attached Contractor Disclosure Statement was submitted to the County of Westchester on _____ and was true as signed, and that
(*Date*)
since the above date nothing has occurred which changes in any way the responses made to the questions contained in the attached Contractor Disclosure Statement.

Submitted by: _____
(Signature)
Name (Print): _____
Title (Print): _____

Sworn to before me this ____ day of _____, 200_

_____
NOTARY PUBLIC

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACTOR'S DISCLOSURE STATEMENT

Questions:

1. The Business Address and taxpayer identification number of Contractor and primary telephone number for such location.

2. List the Business Addresses and primary telephone numbers for such locations, if different from answer to #1 above, where Contractor has been located over the last five (5) years.

3. List all other names and taxpayer identification numbers under which the Contractor, or the Principals and Officers of Contractor, have conducted business within the prior five (5) years.

4. For any response to #3 above, list any and all Westchester County contracts that were awarded to such "other name" Business Entity.

5. List the type of Business Entity that the Contractor is presently organized as (for example - sole proprietorship, partnership, joint venture or corporation).

COMPLETE THIS FORM USING BLACK INK ONLY

6. If Contractor is a corporation, list the date that the Contractor was incorporated. Also list the name of the Government Agency and location of said Agency in which a certificate of incorporation, certificate of doing business or equivalent, has been filed and the date of any amendments thereto. If, however, the Contractor is a partnership, list the date that the partnership was formed and the name of the Government Agency and location of said Agency in which a business certificate for partnership or equivalent has been filed.

7. List all the names, current Business Addresses and business telephone numbers of the Principals and Officers of the Contractor. If the Contractor is a partnership, list all partners and their business telephone numbers.

8. List the names, current Business Addresses, telephone numbers and taxpayer identification numbers of all Affiliates of the Contractor.

9. List all the names, Business Addresses and telephone numbers of the Principals and Officers of the Affiliates listed in response to #7 above. If the Affiliate is a partnership, list the Business Addresses and business telephone numbers of all partners.

COMPLETE THIS FORM USING BLACK INK ONLY

10. Is the Contractor Controlled by another Business Entity? ____Yes ____No. If you answered yes, please identify the name, Business Address and telephone number of that Controlling Business Entity and list any contracts that the Controlling Business Entity has had with Westchester County in the past five (5) years?

    _____
    _____
    _____
    _____
    _____

11. If the Contractor has Control of any other Business Entity that has had a Contract with the County of Westchester in the past five (5) years, please identify the name, Business Address and telephone number of that Controlled Business Entity.

    _____
    _____
    _____
    _____
    _____

12. List any and all contract sanctions imposed on the Contractor or on a Business Entity listed in response to #3 above that was imposed by a Government Agency during the prior five (5) years, including, but not limited to, all cautions, suspensions, debarments, cancellations of a contract based on business conduct, declarations of default, determinations of ineligibility to bid or whether any proceedings to determine eligibility to bid are pending.

    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____

13. List the contract sanction history for the past five (5) years, as defined in #12 above, for any Affiliate of the Contractor.

    _____
    _____
    _____
    _____
    _____
    _____
    _____

COMPLETE THIS FORM USING BLACK INK ONLY

14. If you answered yes to #10 above, list the contract sanction history as defined in #12 above for the Controlling Business Entity during the past five (5) years.

15. List any and all prevailing wage or supplement payment violations; state labor law violations deemed willful and any other federal or state citations, notices, violation orders, pending administrative hearings or proceedings or determinations of a violation of any labor law or regulation regarding the Contractor.

16. List all Investigations of the Contractor, its Principals and Officers or, if a partnership, of the Contractor's Partners. Also list all investigations of Affiliates, their Principals and Officers or, if a partnership, of their Partners.

COMPLETE THIS FORM USING BLACK INK ONLY

17. Have all Federal and State income tax returns, if required, been filed by Contractor during the last five (5) years? ____Yes ____No If you answered no, please explain why such returns were not filed.

_____
_____
_____
_____
_____

18. Are there any criminal proceedings pending against the Contractor or any Principal or Officer of the Contractor or partner, if Contractor is a partnership? ____Yes _____No If you answered yes, please provide details of the pending criminal proceedings.

_____
_____
_____
_____
_____
_____

19. List the record of all criminal convictions of the Contractor, any Principal or Officer or partner, if Contractor is a partnership, and of any former Principal or Officer, of the Contractor or former partner, if Contractor is a partnership, for any crime related to truthfulness or business conduct and for any felony committed within the prior ten (10) years.

_____
_____
_____
_____
_____
_____
_____
_____

20. List all bankruptcy proceedings that the Contractor or its Affiliates have been the subject of within the past seven (7) years, whether pending or completed.

_____
_____
_____
_____
_____
_____
_____
_____

COMPLETE THIS FORM USING BLACK INK ONLY

21. Is the Contractor a successor, assignee or Affiliate of a Business Entity that has ever been denied a Contract or deemed ineligible to bid on a Government Agency contract?
____Yes No ____ If you answered yes, explain below.

_____
_____
_____
_____
_____
_____
_____
_____

OATH

I swear that all of the above answers are true based on my knowledge of the facts, or are believed by me to be true, based upon a review of records containing the facts or based upon information I obtained from someone who has knowledge of the facts; and that I have authority to sign this document; and that the answers given above have not been made in a manner intended to deceive or to defeat the purpose of the Contractor Disclosure Statement, which is to assist the County of Westchester in determining if the Contractor is a responsible bidder.

Submitted by: _____
(Signature)

Name (Print): _____

Title (Print): _____

Sworn to before me this ____ day of

_____, 20__

_____
NOTARY PUBLIC

COMPLETE THIS FORM USING BLACK INK ONLY

REQUIRED DISCLOSURE OF RELATIONSHIPS TO COUNTY

(Prior to execution of a contract by the County, a potential County contractor must complete, sign and return this form to the County)

Contract Name and/or ID No.:
(To be filled in by County)
Name of Contractor:
(To be filled in by Contractor)

A potential County contractor must complete this form as part of the proposed County contract.

1.) Are any of the employees that the Contractor will use to carry out this contract also a County officer or employee, or the spouse, child, or dependent of a County officer or employee?

Yes _____ No _____

If yes, please provide details (attach extra pages, if necessary): _____
_____

2.) Are any of the owners of the Contractor or their spouses a County officer or employee?

Yes _____ No _____

If yes, please provide details (attach extra pages, if necessary): _____
_____

3.) Do any County officers or employees have an **interest**[1] in the Contractor or in any approved subcontractor that will be used for this contract?

Yes _____ No _____

If yes, please provide details (attach extra pages, if necessary): _____
_____

By signing below, I hereby certify that I am authorized to complete this form for the Contractor.

_____

Name: _____
Title: _____
Date: _____

[1] "Interest" means a direct or indirect pecuniary or material benefit accruing to a County officer or employee, his/her spouse, child or dependent, whether as the result of a contract with the County or otherwise. For the purpose of this form, a County officer or employee shall be deemed to have an "interest" in the contract of:

1.) His/her spouse, children and dependents, except a contract of employment with the County;
2.) A firm, partnership or association of which such officer or employee is a member or employee;
3.) A corporation of which such officer or employee is an officer, director or employee; and
4.) A corporation of which more than five (5) percent of the outstanding capital stock is owned by any of the aforesaid parties.

QUESTIONNAIRE REGARDING BUSINESS ENTERPRISES OWNED AND CONTROLLED BY SERVICE-DISABLED VETERANS

The County believes it is a laudable goal to provide business opportunities to veterans who were disabled while serving our country, and wants to encourage the participation in County contracts of certified business enterprises owned and controlled by service-disabled veterans. As part of the County's program to encourage the participation of such business enterprises in County contracts, and in furtherance of Article 17-B of the New York State Executive Law, we request that you answer the questions listed below.

The term "Certified Service-Disabled Veteran-Owned Business" shall mean a business that is a certified service-disabled veteran-owned business enterprise under the New York State Service-Disabled Veteran-Owned Business Act (Article 17-B of the Executive Law).

1. Are you a business enterprise that is owned and controlled by a service-disabled veteran in accordance with the standards listed above?

_____ No
_____ Yes

2. Are you certified with the State of New York as a Certified Service-Disabled Veteran-Owned Business?

_____ No
_____ Yes

3. If you are certified with the State of New York as a Certified Service-Disabled Veteran-Owned Business, please attach a copy of the certification.

Name of Firm/Business Enterprise: _____
Address: _____
Name/Title of Person completing Questionnaire: _____
Signature: _____

STATE OF NEW YORK)
) ss.:
COUNTY OF)

_____

Notary Public

Date:

SCHEDULE "F"
CRIMINAL BACKGROUND DISCLOSURE
INSTRUCTIONS

Pursuant to Executive Order 1-2008, the County is required to maintain a record of criminal background disclosure from all persons providing work or services in connection with any County contract, including leases of County-owned real property and licenses:

a.) If any of the persons providing work or services to the County in relation to a County contract are not subject to constant monitoring by County staff while performing tasks and/or while such persons are present on County property pursuant to the County contract; and
b.) If any of the persons providing work or services to the County in relation to a County contract may, in the course of providing those services, have access to sensitive data (for example SSNs and other personal/secure data); facilities (secure facilities and/or communication equipment); and/or vulnerable populations (for example, children, seniors, and the infirm).

In those situations, the persons who must provide a criminal background disclosure ("Persons Subject to Disclosure") include the following:

a.) Consultants, Contractors, Licensees, Lessees of County-owned real property, their principals, agents, employees, volunteers or any other person acting on behalf of said Contractor, Consultant, Licensee, or Lessee who is at least sixteen (16) years old, including but not limited to Subconsultants, subcontractors, Sublessess, or Sublicensees who are providing services to the County, and
b.) Any family member or other person, who is at least sixteen (16) years old, residing in the household of a County employee who lives in housing provided by the County located on County property.

Under Executive Order 1-2008, it is the duty of every County Consultant, Contractor, Licensee, or Lessee to inquire of each and every Person Subject to Disclosure and disclose whether they have been convicted of a crime or whether they are subject to pending criminal charges, and to submit this form with that information.[1] Accordingly, you are required to complete the attached Criminal Background Disclosure Form and Certification.

Please note that under no circumstances shall the existence of a language barrier serve as a basis for the waiver of or an exception from the disclosure requirements of Executive Order 1-2008. If translation services are required by the Consultant, Contractor, Licensee, or Lessee to fulfill this obligation, it shall be at the sole cost and expense of the Consultant, Contractor, Licensee, or Lessee.

Please also note that the conviction of a crime(s) and/or being subject to a pending criminal charge(s) will not automatically result in a denial of a person's right to work on a County contract, right to be on County property, or license, but may, if the County determines that the prior conviction(s) or pending criminal charge(s) create an unacceptable risk. However, if a person fails to list or falsifies any part of his/her conviction history or any pending criminal charge(s) for any reason, he/she may be prohibited from working or being on County property without any risk assessment. If it is later determined that a Person Subject to Disclosure failed to disclose a criminal conviction or pending criminal charge for any reason, his/her right to work on a County contract, be on County property, or license may be terminated at any time.

Please further note that, pursuant to Executive Order 1-2008, and subject to the applicable provisions of New York Correction Law §§ 752 and 753, the County has the right to bar a Person Subject to Disclosure from providing work or services to the County or from being on County property if any such person has:

a.) A conviction of a crime(s);
b.) A pending criminal proceeding for a crime(s); or
c.) Refused to answer questions concerning his/her criminal background

[1] For these disclosures, a "crime" or "pending criminal charge" includes all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State.

Please finally note that any failure by a County Consultant, Contractor, Licensee, or Lessee to comply with the disclosure requirements of Executive Order 1–2008 may be considered by the County to be a material breach and shall be grounds for immediate termination by the County of the related County contract.

Exemptions

Executive Order 1-2008 exempts from the aforementioned disclosure requirements Persons Subject to Disclosure:

a.) for whom the County has already conducted a background check and issued a security clearance that is in full force and effect; and

b.) for whom another state or federal agency having appropriate jurisdiction has conducted a security and/or background clearance or has implemented other protocols or criteria for this purpose that apply to the subject matter of a County contract that is in full force and effect.

If you are claiming an exemption for one or more Persons Subject to Disclosure, you must notify the Procuring Officer[2]. The Procuring Officer will then determine whether the Person(s) Subject to Disclosure are actually exempt, and provide written notification of his/her determination. If the Procuring Officer determines that a Person Subject to Disclosure is not exempt, the Procuring Officer will notify you of that determination, and you will have to include disclosures for that person on your Criminal Background Disclosure Form and Certification.

[2] Procuring Officer" shall mean the head of the department or the individual or individuals authorized by the head(s) of the department(s) undertaking the procurement and with respect to those matters delegated to the Bureau of Purchase and Supply pursuant to Section 161.11(a) of the Laws of Westchester County, the Purchasing Agent.

Subconsultants, Subcontractors, Sublessees, or Sublicensees

Under Executive Order 1-2008, it is your duty to ensure that any and all approved subconsultants, subcontractors, sublessees, or sublicensees complete and submit the attached Criminal Background Disclosure Form and Certification for all of their respective Persons Subject to Disclosure. This must be done before such a subconsultant, subcontractor, sublessees, or sublicensees can be approved to perform work on a contract.

New Persons Subject to Disclosure

Under Executive Order 1-2008, you have a **CONTINUING OBLIGATION** to maintain the accuracy of the Criminal Background Disclosure Form and Certification (and any accompanying documentation) for the duration of this contract, including any amendments or extensions thereto. Accordingly, it is your duty to complete and submit an updated Criminal Background Disclosure Form and Certification whenever there is a new Person Subject to Disclosure for this contract. **NO NEW PERSON SUBJECT TO DISCLOSURE SHALL PERFORM WORK OR SERVICES OR ENTER ONTO COUNTY PREMISES UNTIL THE UPDATED CRIMINAL BACKGROUND DISCLOSURE FORM AND CERTIFICATION IS FILED WITH THE PROCURING OFFICER.** You shall also provide the County with any other updates that may be necessary to comply with the disclosures required by Executive Order 1-2008.

PLEASE CONTINUE TO THE

Criminal Background Disclosure Form and Certification

BEGINNING ON THE NEXT PAGE

CONTRACT #:_____

Name of Consultant, Contractor, Lessee, or Licensee: _____

CRIMINAL BACKGROUND DISCLOSURE FORM AND CERTIFICATION

If this form is being completed by a subconsultant, subcontractor, sublessee, or sublicensee, please consider all references in this form to "consultant, contractor, lessee, or licensee" to mean "subconsultant, subcontractor, sublessee, or sublicensee" and check here: _____

I, _____, certify that I am a principal or a
(Name of Person Signing Below)

representative of the Consultant, Contractor, Lessee, or Licensee and I am authorized to complete and execute this Criminal Background Disclosure Form and Certification. I certify that I have asked each Person Subject to Disclosure the following questions:

- **Have you or your company ever been convicted of a crime (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State) including, but not limited to, conviction for commission of fraud, embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property?**

- **Are you or your company subject to any pending criminal charges (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State)?**

I certify that the names and titles of Persons Subject to Disclosure who refused to answer **either** of the questions above are:

1. _____
2. _____
3. _____
4. _____
5. _____

(If more space is needed, please attach separate pages labeled "REFUSED to Answer - Continued.")

I certify that the names and titles of Persons Subject to Disclosure who answered "Yes" to **either of the** questions above are:

1. _____

2. _____

3. _____

4. _____

5. _____

(If more space is needed, please attach separate pages labeled "YES Answers - Continued.")

Each Person Subject to Disclosure listed above who has either **been convicted of a crime(s)** and/or **is subject to a pending criminal charge(s)** must answer additional questions. Those questions are below.

A Person Subject to Disclosure who has **been convicted of a crime(s)** must respond to the following (please attach separate pages with responses for each person, with their name and title):

1.) Describe the reason for being on County property if applicable, identify the specific duties and responsibilities on this project which you intend to perform for the County, including but not limited to, access to sensitive data and facilities and access to vulnerable populations.
2.) Please list all criminal convictions along with a brief description of the crime(s) (including all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State).
3.) Please provide the date and place of each conviction.
4.) Please provide your age at the time of each crime for which you were convicted.
5.) Please provide the legal disposition of each case.
6.) Please provide any information either produced by yourself or someone on your behalf in regards to your rehabilitation and good conduct.

A Person Subject to Disclosure who **is subject to a pending criminal charge(s)** must respond to the following (please attach separate pages with responses for each person, with their name and title):

1.) Describe the reason for being on County property and if applicable, identify the specific duties and responsibilities on this project which you intend to perform for the County, including but not limited to, access to sensitive data and facilities and access to vulnerable populations.
2.) Please identify all pending criminal charges (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State).
3.) Please briefly describe the nature of the pending charges and the date upon which it is alleged that a crime was committed.

I hereby certify that all of the information provided herein (and in any and all attachments) is true and accurate and that all disclosures required by Executive Order 1-2008 and this Criminal Background Disclosure Form and Certification have been completed. By my signature below, I hereby affirm that all of the facts, statements and answers contained herein (and in any and all attachments) are true and correct. I understand that providing false or incomplete information or withholding by omission or intention pertinent information will be cause for refusing further consideration of my being utilized under this contract.

It is understood and agreed that no Person Subject to Disclosure shall perform work or services or enter onto County property until this required Criminal Background Disclosure Form and Certification is filed with the Procuring Officer.

It is understood and agreed that to the extent that new Persons Subject to Disclosure are proposed to perform work or provide services under this contract after filing of this Criminal Background Disclosure Form and Certification with the Procuring Officer, such new Persons Subject to Disclosure shall not perform work or provide services or enter into County property until an updated Criminal Background Disclosure Form and Certification has been filed with the Procuring Officer.

It is further understood and agreed that the consultant, contractor, lessee, or licensee has a continuing obligation to maintain the accuracy of the Criminal Background Disclosure Form and Certification for the duration of this contract, including any amendments or extensions thereto, and shall provide any updates to the information to the County as necessary to comply with the requirements of Executive Order 1-2008.

_____

Name: _____
Title: _____
Date: _____

_____ _____
Notary Public Date

SUBCONTRACTOR'S SEALED BID SUBMISSION

Westchester County Contract No.:_____

Name of Subcontractor:_____

Address:_____

Phone #:_____ **Fax #:**_____

E-mail address:_____

Name of Contractor to whom this bid is submitted:_____

Scope of Work to be performed by Subcontractor (e.g., electrical, plumbing, HVAC):

_____

_____

The price agreed upon by and between Contractor and Subcontractor for the full performance of the Subcontractor's work:

$:_____

In words (e.g, one hundred thousand dollars and xx/100):

_____

_____

Subcontractor	**Contractor**
_____	_____
Signature	Signature
By_____	**By**_____
(print name & title)	**(print name & title)**

THE SUCCESSFUL LOW BIDDER, BEFORE AWARD OF THE CONTRACT, MUST PROCURE AND PROVIDE TO THE COUNTY, FROM EACH OF THE ABOVE DENOTED SUBCONTRACTORS, A CONTRACT DISCLOSURE STATEMENT (PROPOSAL PAGES 24-32) AND THE REQUIRED DISCLOSURE OF RELATIONSHIPS TO COUNTY (PROPOSAL PAGES 33-34)

COMPLETE THIS FORM USING BLACK INK ONLY

2. INFORMATION FOR BIDDERS

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

INFORMATION FOR BIDDERS

1. ADDENDA AND INTERPRETATION

No interpretation of the meaning of the plans, specifications or other contract documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to the Westchester County Department of Public Works, Division of Engineering, Room 512, Michaelian Office Building, White Plains, New York, and to be given consideration must be received at least five (5) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be posted on the internet not later than three (3) days prior to the date fixed for the opening of bids. Revisions to plans or drawings requiring the issuance of additional or revised drawings will be noted on the internet with instructions how to acquire copies of such revised plans or drawings. Failure of any bidder to receive any such addendum or interpretation or any other form, instrument or document shall not relieve any bidder from any obligation under its bid as submitted. All addenda so issued shall become part of the contract documents.

A bidder's failure to request a clarification, interpretation, etc. of any portion of the plans, specifications, or contract or to point out any inconsistency therein will preclude such bidder from thereafter claiming any ambiguity, inconsistency, or error which should have been discovered by a reasonably prudent bidder and from asserting any claim for damages arising directly or indirectly therefrom.

2. VOIDED CLAUSES

Wherever in this booklet any page is stamped "VOID", only the section(s) or paragraph(s) so stamped are void. All other sections(s) and paragraph(s) remain in full force and effect.

3. PRE-BID SITE INSPECTION

Unless otherwise stated, on building construction work, bidders are free and encouraged to examine the work site during normal work hours preceding the date on which bids are to be opened. For those bidders requesting further clarification of the conditions, an appointment with the County's representative, on the eighth day (Tuesday) prior to the bid opening date, can be requested, by contacting the, Department of Public Works, Division of Engineering at (914) 995-2553.

Each bidder must inform itself fully of the conditions relating to the work to be performed. Failure to do so will not relieve a successful bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the contract documents and to complete the contemplated work for the consideration set forth in its Bid.

At the time of the opening of bids each bidder will be presumed to have inspected the sites and to have read and to be thoroughly familiar with the Plans and Contract Documents (including all addenda).

4. BID SECURITY

Bid Security shall be provided in accordance with the "Notice to Contractors." Where

a Performance and Payment bond is required in the Notice to Contractors, the executed "Bid Bond and Consent of Surety" of the Proposal Pages must be submitted with the Bid when the bid is more than $100,000. The successful bidder, no matter the size of its bid, will be required to furnish a Performance and Payment Bond.

Where a Performance and Payment Bond is not specified in the Notice to Contractors, then the required Security may be furnished in the form of a Certified Check; drawn to the order of "County of Westchester, clipped to the top of the front cover and submitted with the Bid.

Certified checks submitted will be returned to all bidders submitting certified checks within three (3) days after the opening of bids unless the bidder or bidders submitting certified checks are among the two lowest bidders. At any time after the opening of bids, the second lowest bidder, if the second lowest bidder has submitted a certified check, may substitute a bid bond for the certified check by presenting the bond to the Secretary of the Board of Acquisition and Contract. This bond shall be in the form and coverage required by the County and shall be in an amount not less than the amount of the bidder's certified check. After receipt, approval and acceptance of the bond by the County, the County will forward to the bidder a County check in an amount equal to the bidder's certified check.

All certified checks submitted will be returned to the two lowest bidders within 48 hours after the successful bidder executes the required contract and furnishes the County with all necessary bonds and insurance certificates.

In the event that the successful bidder has not executed the required contract and furnished the required bonds and insurance certificates within forty-five (45) days after the opening of bids, the County, upon demand from a bidder (except for the successful bidder), will send a County check to the bidder in the amount of the bidder's certified check.

Failure of the successful bidder to execute the contract and furnish the necessary bonds and insurance certificates shall result in forfeiture of the bid security, such sum to be retained by the County as liquidated damages.

5. PERFORMANCE AND PAYMENT BOND

If required pursuant to "Notice to Contractors."

If a Performance and Payment bond is required in accordance with the "Notice to Contractors", the "Bid Bond and Consent of Surety" of the Proposal Pages must be executed by the Contractor's Surety Company and submitted with the Bid for all bids over $100,000.

Simultaneously with its delivery of the executed contract, the successful bidder shall deliver to the County an executed bond in the amount of one hundred percent of the accepted bid as security for the faithful performance of its contract and in the amount of one hundred percent for the payment of all persons performing labor or furnishing materials in connection therewith, prepared in satisfactory form and having as surety thereon such bond underwriter or surety that appears on the U.S. Treasury's listing of approved sureties (Department Circular 570), and is licensed to transact business in New York State. In the event such Surety ceases to appear on the U.S. Treasury's listing of approved sureties (Department Circular 570) or ceases to be licensed to transact business in New York State or becomes insolvent or enters liquidation proceedings, the Contractor, at its sole cost, shall furnish a replacement bond from a surety satisfactory to the County.

The form of contract and Performance and Payment Bond to be used in connection with this Contract and to become a part of the contract documents is attached in the section entitled "Sample Contract and Bond for Construction".

6. INDEMNIFICATION AGREEMENT

The Contractor agrees:

A. that except for the amount, if any, of damage contributed to, caused by or resulting from the negligence of the County, the Contractor agrees to indemnify and hold harmless the County of Westchester, its officers, employees, elected officials, and agents from and against any and all liability, damage, claims, demands, costs, judgments, fees, attorneys' fees or loss arising directly or indirectly out of the performance or failure to perform hereunder by the Contractor or third parties under the direction or control of the Contractor; and

B. to provide defense for and defend, at its sole expense, any and all claims, demands or causes of action directly or indirectly arising out of the Agreement and to bear all other costs and expenses related thereto.

7. INSURANCE REQUIREMENTS

The Contractor, upon award of the contract and throughout the term of the Agreement, shall obtain at its own cost and expense the required insurance as delineated below from insurance companies licensed in the State of New York, carrying a Best's financial rating of A or better. Contractor shall provide evidence of such insurance to the County of Westchester ("County"), either by providing a copy of policies and/or certificates as may be required and approved by the Director of Risk Management of the County ("Director"). The policies or certificates thereof shall provide that ten (10) days prior to cancellation or material change in the policy, notices of same shall be given to the Board of Acquisition and Contract of the County of Westchester by registered mail, return receipt requested, for all of the following stated insurance policies, with a copy also sent to the Director of Risk Management of the County. All notices shall name the Contractor and identify the Contract Number.

If at any time any of the policies required herein shall be or become unsatisfactory to the Director, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Director, the Contractor shall upon notice to that effect from the County, promptly obtain a new policy, and submit the policy or the certificate as requested by the Director to the Office of Risk Management of the County for approval by the Director. Upon failure of the Contractor to furnish, deliver and maintain such insurance, the Agreement, at the election of the County, may be declared suspended, discontinued or terminated.

Failure of the Contractor to take out, maintain, or the taking out or maintenance of any required insurance, shall not relieve the Contractor from any liability under the Agreement, nor shall the insurance requirements be construed to conflict with or otherwise limit the contractual obligations of the Contractor concerning indemnification.

All property losses shall be made payable to the "County of Westchester" and adjusted with the appropriate County personnel.

In the event that claims, for which the County may be liable, in excess of the insured amounts provided herein are filed by reason of Contractor's negligent acts or omissions under the

agreement or by virtue of the provisions of the labor law or other statute or any other reason, the amount of excess of such claims or any portion thereof, may be withheld from payment due or to become due the Contractor until such time as the Contractor shall furnish such additional security covering such claims in form satisfactory to the Director.

In the event of any loss, if the Contractor maintains broader coverage and/or higher limits than the minimums identified herein, the County shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the County.

The Contractor shall provide proof of the following coverage. (Other coverage may be required by the County of Westchester based on specific needs. If such other coverages are required for a specific contract, those coverages will be described in the "Special Clauses" of the contract specifications):

a) Workers' Compensation and Employer's Liability. Certificate form C-105.2 or State Fund Insurance Company form U-26.3 is required for proof of compliance with the New York State Workers' Compensation Law. State Workers' Compensation Board form DB-120.1 is required for proof of compliance with the New York State Disability Benefits Law. Location of operation shall be "All locations in Westchester County, New York."

Where an applicant claims to not be required to carry either a Workers' Compensation Policy or Disability Benefits Policy, or both, the employer must complete NYS form CE-200, available to download at: http://www.wcb.ny.gov.

If the employer is self-insured for Workers' Compensation, he/she should present a certificate from the New York State Worker's Compensation Board evidencing that fact (Either SI-12, Certificate of Workers' Compensation Self-Insurance, or GSI-105.2, Certificate of Participation in Workers' Compensation Group Self-Insurance).

b) Commercial General Liability Insurance with a combined single limit of $1,000,000 (c.s.1) per occurrence and a $2,000,000 aggregate limit naming the "County of Westchester" as an additional insured on a primary and non-contributory basis. This insurance shall include the following coverages:
   i. Premises - Operations.
   ii. Broad Form Contractual.
   iii. Independent Contractor and Sub-Contractor.
   iv. Products and Completed Operations.

NOTE: Additional insured status shall be provided by standard or other endorsement that extends coverage to the County of Westchester for both on-going and completed operations.

All Contracts involving the use of explosives, demolition and/or underground work shall provide proof that XCU is covered.

c) Commercial Umbrella/Excess Insurance: $2,000,000 each Occurrence and Aggregate naming the "County of Westchester" as additional insured, written on a "follow the form" basis.

d) Owners Protective Liability Policy naming the County as insured, with a minimum limit of liability per occurrence of $3,000,000 (where applicable, or as determined by the Director, Risk Management)

e) Automobile Liability Insurance with a minimum limit of liability per occurrence of $1,000,000 for bodily injury and a minimum limit of $100,000 per occurrence for property damage or a

combined single limit of $1,000,000 unless otherwise indicated in the contract specifications. This insurance shall include for bodily injury and property damage the following coverages and name the "County of Westchester" as additional insured:

i. Owned automobiles.
ii. Hired automobiles.
iii. Non-owned automobiles.

f) Construction Insurance: For the construction, renovation or repair of bridges, viaducts or similar structures, the Contractor at its own cost and expense shall provide and maintain a "Bridge Builder's Risk Form, All Risk Insurance Contract," with flat premium endorsement, until the construction contract is accepted by the Board of Acquisition and Contract of the County of Westchester. The coverage shall be written for 100% of the completed value, covering the Contractor and County of Westchester as the insureds. The Contractor shall provide the original and duplicate policy to the County (unless the County shall accept, in lieu thereof, all contained endorsements including all applicable provisions and coverages).

For the construction of (a) new buildings and (b) for additions or repairs of existing buildings or structures, the Contractor at its own cost and expense shall provide and maintain a "Builder's Risk Form, All Risk Insurance Contract," with flat premium endorsement, until the construction contract is accepted by the Board of Acquisition and Contract of the County of Westchester. The coverage shall be written for 100% of the completed value, covering the Contractor and County of Westchester as the insureds. The Contractor shall provide the original and duplicate policy to the County (unless the County shall accept, in lieu thereof, all contained endorsements including all applicable provisions and coverages).

All policies of the Contractor shall be endorsed to contain the following clauses:

(a) Insurers shall have no right to recovery or subrogation against the County (including its employees and other agents and agencies), it being the intention of the parties that the insurance policies so effected shall protect both parties and be primary coverage for any and all losses covered by the above-described insurance.

(b) The clause "other insurance provisions" in a policy in which the County is named as an insured, shall not apply to the County.

(c) The insurance companies issuing the policy or policies shall have no recourse against the County (including its agents and agencies as aforesaid) for payment of any premiums or for assessments under any form of policy.

(d) Any and all deductibles in the above described insurance policies shall be assumed by and be for the account of, and at the sole risk of, the Contractor.

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8. PREVAILING WAGE RATES AND SUPPLEMENTS

A. Wages to be Paid and Supplements to be Provided

Each laborer, workman or mechanic employed by the Contractor(s), Sub-contractor(s) or other person(s) doing or contracting to do the whole or part of the work contemplated by this Contract, shall be paid the prevailing wages and provide the supplements (including but not limited to health, welfare and pension benefits) as required by Article 8 (Section 220-223) and Article 9 (230-239) of the New York State Labor Law.

B. Schedule of Hourly Rates/Supplements

The "Schedule of Hourly Rates and Supplements" shows the prevailing hourly rates of wages to be paid and supplements to be provided. It is the County's preference that such supplements shall be paid to a Federally qualified Pension, Health and Welfare program and New York State Registered Apprentice Training Program.

Classifications not appearing on the rate sheet can be used only with the consent of the Commissioner of Public Works and then the rate to be paid will be given by the Commissioner of Public Works after advising with the State Department of Labor.

C. Grounds for Cancellation of Contract

In the event of a failure, to pay the prevailing wages and provide the supplements in accordance with the New York State Labor Law, and as described in this Contract, it shall be considered a material breach. For the breach or violation of this provision, without limiting any other rights or remedies to which the County or any individual may be entitled or any civil or criminal penalty for which any violator may be liable, the County shall have the right, in its discretion, to terminate this agreement immediately upon notice. In such event, the Contractor(s), Sub-Contractor(s), et al shall be liable to the County for any additional costs incurred by the County in the completion of the project.

In addition to any other remedies available to the County and irrespective of any applicable penalties pursuant to law, the County may deduct from the amount payable to the Contractor under this contract five hundred ($500.00) dollars as reimbursement for the costs it incurs in investigating any violation of Section 220 of the Labor Law.

D. Records to be kept on Site

The Contractor(s), Sub-contractor(s), et al. shall certify their payrolls and keep them on site and available, in addition to the following informative records:

1) Record of hours worked by each workman, laborer and mechanic on each day;

2) Record of days worked each week by each workman, laborer and mechanic;

3) Schedule of occupation or occupations at which each workman, laborer and mechanic on the project is employed during each work day and week;

4) Schedule of hourly wage rates paid to each workman, laborer and mechanic for each occupation.

5) A statement or declaration signed by each workman, laborer and mechanic attesting that they have been provided with a written notice, informing them of the prevailing wage rates and supplements requirement for this contract.

E. Responsibility of the Contractor, Sub-Contractor, et al.

The Contractor(s), Sub-Contractor(s), et al. will display the posters in a conspicuous location at the site and distribute the wallet cards to the employees. These posters and wallet cards will inform the employees that they are entitled to receive the prevailing wages and supplements as determined by the Department of Labor and will list the

Department of Labor's Public Work field offices, with phone numbers for individuals to call if they believe their rights are being violated.

F. Pay for a Legal Day's Work & Use of Apprentices

The wages to be paid for a legal day's work, as hereinbefore defined, to laborers, workmen or mechanics upon such public works, shall be not less than the prevailing rate of wages as hereinafter defined. Serving laborers, helpers, assistants and apprentices shall not be classified as common labor and shall be paid not less than the prevailing rate of wages as hereinafter defined. No employee shall be deemed to be an apprentice unless he is individually registered in an apprenticeship program which is duly registered with the Industrial Commissioner in conformity with the provision of Article 23 of the Labor Law. The wages to be paid for a legal day's work, as hereinbefore defined, to laborers, workmen or mechanics upon any material to be used upon or in connection therewith shall be not less than the prevailing rate for a day's work in the same trade or occupation in the locality within the state where such public work on, about or in connection with which such labor is performed in its final or completed form is to be situated, erected or used and shall be paid in cash; provided, however, that an employer may pay his employees by check upon a Certificate of the Industrial Commissioner to be issued only after a hearing upon the application to pay by check, which hearing shall be with notice of at least five days to be served personally or by mail on all interested persons, or if not served as aforesaid, then to be published in a manner directed by the Industrial Commissioner, which shall afford interested persons the opportunity to appear and to be heard at such hearing, and after proof has been furnished satisfactorily to the Industrial Commissioner of the employer's financial responsibility and the employer gives assurance that such checks may be cashed by employees without difficulty and for the full amount for which they are drawn. Such Contracts shall contain a provision that each laborer, workman or mechanic, employed by such Contractor, Subcontractor or other person about or upon such public works, shall be paid the wages herein provided.

G. Fiscal Officer's Duty to Determine Schedule of Wages

It shall be the duty of the fiscal officer (the "New York State Commissioner of Labor"), to ascertain and determine the schedule of wages to be paid workmen, laborers and mechanics on each such public work, prior to the time of the advertisement for bids, and such schedule of wages shall be annexed to and form a part of the specifications for the work. Such fiscal officer shall file with the department having jurisdiction such schedule of wages to the time of the commencement of the advertisement for bids on all public works proposed to be constructed. The term "Contract" as used in this subdivision also shall include reconstruction and repair of any such public work.

Where Contracts are not awarded within ninety days of the date of the establishment of the prevailing rate of wages by the fiscal officer, the department of jurisdiction shall request of the fiscal officer a redetermination of a schedule of wages.

H. Penalty for Payment of Less than Prevailing Wages

Any person or corporation that willfully pays after entering into such Contract, less than such stipulated wage scale as established by the fiscal officer shall be guilty of a

misdemeanor and upon conviction shall be punished for such first offense by a fine of five hundred dollars or by imprisonment for not more than thirty days, or both fine and imprisonment; for a second offense by a fine of one thousand dollars, and in addition thereto the Contract on which the violation has occurred shall be forfeited and no such person or corporation shall be entitled to receive any sum nor shall any officer, agent, or employee of the state, municipal corporation or commission or board appointed pursuant to law pay the same or authorize its payment from the funds under his charge or control to any person or corporation for work done upon any Contract, on which the Contractor has been convicted for a second offense in violation of the provisions of this section.

9. LABOR AND COMPLIANCE WITH LABOR LAW

A. Preference for Westchester Residents

The Contractor agrees that in the performance of the work under this Contract he will give preference, and so far as legally possible, to employ citizens and residents of Westchester County.

B. Certifications To Be Filed

It is agreed that, in accordance with Section 220-d of the Labor Law as amended before final payment by or on behalf of the County for any sum due on account of a Contract for a public improvement, the Contractor and each and every Subcontractor of the Contractor or a Subcontractor is required to file a statement in writing in form satisfactory to the Commissioner of Finance certifying to the amounts then due and owing from such Contractor or Subcontractor filing such statement to or on behalf of any and all laborers for daily or weekly wages or supplements on account of labor performed upon the work under the Contract, setting forth therein the names of the persons whose wages or supplements are unpaid and the amount due to each or on behalf of each respectively, which statement so to be filed shall be verified by the oath of the Contractor or Subcontractor as the case may be that he has read such statement subscribed by him and knows the contents thereof, and that the same is true to his own knowledge.

C. Retention of Funds

It is further agreed that in accordance with Section 220b of the Labor Law, as amended:

1) In case any interested person shall have previously filed a protest in writing objecting to the payment to any Contractor or Subcontractor to the extent of the amount or amounts due or become due to him/her for daily or weekly wages or supplements for labor performed on the public improvement for which such Contract was entered into, or if for any other reason it may be deemed advisable, the Commissioner of Finance may deduct from the whole amount of any payment on account thereof the sum or sums admitted by any Contractor or Subcontractor in such statement or statements so filed to be due and owing by him on account of labor performed on such public improvement before making payment of the amount certified for payment in any estimate or voucher, and may withhold the amount so deducted for the benefit of the laborers, workmen or mechanics whose

wages or supplements are unpaid or not provided, as the case may be, as shown by the verified statements filed by any Contractor or Subcontractor, and may pay directly to any person the amount or amounts shown to be due to him or his duly authorized collective bargaining labor organization, as the case may be, for such wages or supplements by the statements filed as hereinbefore required, thereby discharging the obligation of the Contractor or Subcontractor to the person or his duly authorized collective bargaining labor organization receiving such payment to the extent of the amount thereof, or

2) When any interested person shall file a written complaint with the fiscal officer as defined in section 220-b of the Labor Law, alleging unpaid wages or supplements due for labor performed on a public improvement for which a Contract has been entered into, and said labor is alleged to have been performed within the two year period immediately preceding the date of the filing of said complaint, or if, on the fiscal officer's own initiative, unpaid wages or supplements appear to be due, the fiscal officer shall immediately so notify the financial officer of the civil division interested, or, if there are insufficient moneys still due to the Contractor or Subcontractor to satisfy said wages and supplements, including interest and penalty, the financial officer of another civil division which has entered or subsequently enters into a public improvement contract with the Contractor or Subcontractor, who shall withhold from any payment due or earned by the Contractor or Subcontractor executing said public improvement, sufficient moneys to satisfy said wages and supplements, including interest at the rate provided herein, and any civil penalty that may be assessed as provided herein, pending a final determination. The Commissioner of Finance shall immediately confirm in writing to the fiscal officer the amount of money withheld.

3) Moneys withheld pursuant to this section shall be held by the Commissioner of Finance for the sole and exclusive benefit of the workers employed on said public improvement and for payment of any civil penalty that may be assessed as provided herein and shall not be used for any other purpose except upon court order. Any person, partnership, association, corporation or governmental body who files a lien or commences a judicial proceeding with respect to any moneys withheld pursuant to this section shall notify the fiscal officer in writing of the lien or claim on or before the date of filing of the lien or commencement of the judicial proceeding. In any proceeding to obtain moneys withheld pursuant to this section by any person, partnership, association, corporation or governmental body, the Commissioner of Labor shall have the right to appear and be heard.

4) The fiscal officer shall then cause an investigation to be made to determine whether any amounts are due to the laborers, workmen or mechanics, or on their respective behalves, on such public improvement, for labor performed after the commencement of the three-year period immediately preceding the filing of the complaint or the commencement of the investigation on his own initiative, as the case may be, and shall order a hearing therein at a time and place to be specified and shall give notice thereof, together with a copy of such complaint, or a statement of the facts disclosed upon such investigation, which notice shall be served personally or by mail on all interested persons, including the person complained

against and upon the financial officer of the civil division; such person complained against shall have an opportunity to be heard in respect to the matters complained of, at the time and place specified in such notice, which time shall be not less than five days from the service of said notice. The fiscal officer in such an investigation shall be deemed to be acting in a judicial capacity and shall have the rights to issue subpoenas, administer oaths and examine witnesses. The enforcement of a subpoena issued under this section shall be regulated by the Civil Practice Law and Rules. Such investigation and hearing shall be expeditiously conducted, and upon such hearing and investigation, the fiscal officer shall determine the issues raised thereon and shall make and file an order in his office stating such determination and forthwith serve a copy of such order, either personally or by mail, together with notice of filing, upon the parties to such proceedings, and if the fiscal officer be the Comptroller, upon the Commissioner of the Department of Labor. Such order shall direct payment of wages or supplements found to be due, including interest at the rate of interest then in effect as prescribed by the Superintendent of Banks pursuant to Section fourteen (a) of the Banking law per annum from the date of the underpayment to the date of payment.

5) In addition to directing payment of wages or supplements, including interest found to be due, the order of the fiscal officer may direct payment of a further sum as a civil penalty in an amount not exceeding twenty-five percent of the total amount found to be due. In assessing the amount of the penalty, due consideration shall be given to the size of the employer's business, the good faith of the employer, the gravity of the violation, the history of previous violations of the employer or any successor or substantially-owned affiliated entity or any of the partners if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, as determined by the fiscal officer, and any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article, and the failure to comply with record keeping or other non-wage requirements. Upon the fiscal officer's determination of the penalty, where the fiscal officer is the Commissioner of the Department of Labor, the penalty shall be paid to said Commissioner for deposit in the State Treasury.

6) Upon the entry and service of such order, the Commissioner of Finance shall pay to the claimant, from the moneys due to the Contractor or Subcontractor, the amount of the claim as determined by the fiscal officer and the amount of the civil penalty, if any, shall be paid as provided herein, provided that no proceeding pursuant to Article Seventy-Eight of the Civil Practice Law and Rules for review of said order is commenced by any party aggrieved thereby within thirty days from the date of said order was filed in the office of the fiscal officer. Said proceeding shall be directly in the appellate division of the Supreme Court. Where the fiscal officer is the Commissioner of the Department of Labor, the civil penalty shall be paid to said Commissioner for deposit in the State Treasury. In the event that such a proceeding for review is instituted, moneys sufficient to satisfy the claim and civil penalty shall be set aside by the Commissioner of Finance, subject to the order of the Court.

7) When final determination has been made and such determination is in favor of the complainant, said complainant may in addition to any other remedy provided by this article, institute an action in any Court of appropriate jurisdiction against the person or corporation found violating this article, any substantially-owned affiliated entity or any successor of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article, and any of the partners if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, as determined by the fiscal officer, for the recovery of the difference between the sum, if any, actually paid to him by the Commissioner of Finance pursuant to said order and the amount found to be due him as determined by said order. Such action must be commenced, within three years from the date of the filing of said order, or if the said order is reviewed in a proceeding pursuant to Article Seventy-eight of the Civil Practice Law and Rules, within three years after the termination of such review proceeding.

8) When two final determinations have been rendered against a Contractor, Subcontractor, successor, or any substantially owned affiliated entity of the Contractor or Subcontractor, any of the partners if the Contractor or Subcontractor is a partnership, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article, any of the five largest shareholders of the Contractor or Subcontractor or any successor within any consecutive six-year period determining that such Contractor, Subcontractor, successor, or any substantially-owned affiliated entity of the Contractor or Subcontractor, any of the partners or any of the five largest shareholders of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article has willfully failed to pay the prevailing rate of wages or to provide supplements in accordance with this article, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public work projects are rendered simultaneously, such Contractor, Subcontractor, successor, or any substantially-owned affiliated entity of the Contractor or Subcontractor, any of the partners if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with the State, any municipal corporation or public body for a period of five years from the second final determination, provided, however, that where any such final determination involves the falsification of payroll records or the kickback of wages or supplements, the Contractor, Subcontractor, successor, or any substantially-owned affiliated entity of the Contractor or Subcontractor, any partner if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article shall be ineligible to submit a bid on or be awarded any public work contract with the State, any municipal corporation or public body for a period of five years from the first final determination.

9) Nothing in this subdivision shall be construed as affecting any provision of any other law or regulation relating to the awarding of public contracts.

Pursuant to Section 220-C of the Labor law, any Contractor or Subcontractor who shall upon his oath verify any statement required to be filed herein, which is known by him to be false, shall be guilty of perjury and punishable as provided by the Penal Law.

10. CONTRACTOR'S REPORT OF EMPLOYMENT AND WEEKLY AFFIDAVIT

Each week the Contractor shall furnish to the Commissioner of Public Works the "Contractor's Report Of Employment And Weekly Affidavit" of the Sample Forms.

11. LAWS/REGULATIONS AND APPROPRIATIONS

A. The Contractor shall, at its own cost and expense, comply with all provisions of the Labor Law (i.e. prevailing rate of wages and supplements), Lien Law, Workmen's Compensation Law and all other laws and ordinances affecting this contract or order, either Federal, State or local.

B. It is recognized and understood by the Parties that when this Agreement is subject to future appropriation by the Westchester County Board of Legislators for funds not presently appropriated to pay for this Agreement; the County shall have no liability under this agreement beyond the funds, if any, that are appropriated and available for payment of the amounts due under this Agreement. The Parties understand and intend that the obligation of the County to pay the amounts due hereunder shall constitute a current expense of the County and shall not in any way be construed to be a debt of the County in contravention of any applicable constitutional or statutory limitations or requirements concerning the creation of indebtedness by the County, nor shall anything contained in this Agreement constitute a pledge of the general tax revenues, funds or monies of the County. The County shall pay amounts due under this Agreement exclusively from legally available funds appropriated for this purpose. Notwithstanding the foregoing, the County will do all things lawfully within its power to obtain, maintain, and properly request and pursue funds from which payments under this Agreement may be made, including: (i) the County Executive making provisions for such payments to the extent necessary in the annual budget submitted to the Board of Legislators for the purpose of obtaining funding; and (ii) using its reasonable efforts to have such portion of the budget approved.

12. REFUSAL TO ANSWER QUESTIONS

It is understood and agreed by the Contractor that he/she bears an affirmative obligation to answer questions specifically or directly relating to this agreement before any official, board or agency authorized or empowered to inquire into such matters. This section shall not be construed as barring the Contractor, its directors, officers or employees from exercising their constitutional privilege against self-incrimination.

The foregoing, however, shall not be construed as limiting the rights and remedies of the County in the event of such refusal, and when such body or agency is wholly civil in nature,

failure or refusal to fully cooperate with and diligently answer the inquiries of such official, board or agency may constitute grounds for the termination of this agreement and/or the exercise of any and all other rights or remedies which the County may have by reason of such failure or refusal.

Any and all contracts made with the State, the County of Westchester, or any public department, agency or official thereof, since July 1, 1959 by such person and by any firm, partnership or corporation of which he is a member, partner, director or officer, may be canceled or terminated by the County of Westchester, without incurring any penalty or damages on account of such cancellation or termination, but any monies owing pursuant to said transaction or contract prior to the cancellation and termination, shall be paid.

The successful bidder will be required to make all books and records concerning this contract available during business hours, upon reasonable notice, to duly authorized County personnel for the purpose of ascertaining compliance and/or performance of all provisions of this contract. This provision shall survive the termination of this agreement and for a period of six (6) years thereafter.

13. BID REQUIREMENTS

The Bid must be made on the "Proposal Pages" included in this specification or as provided with an addendum. All blank spaces on said Proposal Pages must be filled in and no change shall be made in the phraseology or in the items as contained therein.

Any bid which fails to name a price per unit of measurement for each of the items for which quantities are given, may be held to be informal and rejected. Bids submitted on Proposal Pages that contain any omissions, alterations, additions or items not called for in the bid documents, or that are illegible, unbalanced, conditional, incomplete or contain irregularities of any kind, may be rejected as informal. If the various parts of the work have been divided into classes and/or items to enable the bidder to bid for different portions of the work in accordance with its estimate of their costs, in the event of any increase or decrease in the quantity will be paid for at the price bid for that particular item. The sum of the amounts for each class or item, obtained by multiplying the approximate quantity by the unit price, shall constitute the total sum bid.

In the event of a discrepancy between the written bid amount and the numerical bid amount, the written amount will take precedence and be controlling as to the amount of the Bid. Any such discrepancy shall be corrected as set forth in Article "Correction Of Errors" of the Information for Bidders.

14. MISCELLANEOUS ADDITIONAL WORK (ITEM W-800)

A. Description - Under this item each Contractor shall furnish all labor, material and equipment required to accomplish miscellaneous additional work:

1) Necessitated by encountering during the course of the work field conditions of a nature not determinable during design; or

2) For which no unit prices are applicable.

B. Method of Measurement - Only that miscellaneous additional work shall be performed by the Contractor and will be paid for by the County, which has been authorized by the Commissioner or the Construction Administrator in writing, prior to its commencement.

C. Article "Increase or Decrease of Quantities: Elimination of Items" of the Information for Bidders, will still apply relative to the percentage of the total awarded contract price that the work under the contract may be increased or decreased.

D. Payment - The total amount paid to the Contractor will be determined in strict accordance with the provisions of Article "Extra Work: Increased Compensation/ Decreased Work: Credit to the Owner" of the General Clauses, and such payment will include only that overhead and profit that is applicable to the work performed under this item.

E. Each Contractor shall include in its total bid the lump sum printed in the Proposal and any bid other than the specified amount will be considered informal.

15. CORRECTION OF ERRORS

Relative to dollar bid items and the required computations as submitted and performed by bidders on the proposal sheets, if there are any inconsistencies derived in multiplying unit bid prices by the stated quantities, the Commissioner reserves the right to reconcile the unit bid prices or the products of the unit bid prices and the stated quantities, when in the Commissioner's professional opinion such reconciliation(s) would concur with the apparent intent of a bidder and the Commissioner's estimated values of the respective bid items of the proposed contract work. In addition to the foregoing, the Commissioner reserves the right to correct all mathematical errors in additions or subtractions.

16. SHOWN QUANTITIES

All bids shall be submitted upon the following express conditions, which shall apply to and become a part of every bid received. The Bidders accept the quantities shown on the Proposal Pages opposite items of the work for which unit prices are to be bid as being approximate estimated quantities. Bidders shall satisfy themselves by personal examination of the location of the proposed work and surroundings thereof, and by such other means as they may prefer, as to the scope of the work and the accuracy of the approximate estimated quantities; and shall not at any time after submission of their bids dispute such approximate estimated quantities nor assert that there was any misrepresentation by the County or any misunderstanding by the Contractor in regard to the quantity or kind of materials to be furnished, or work to be done.

17. QUALIFICATION OF BIDDERS

The County may make such investigation as it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish all information and data for this purpose as may be requested. The County reserves the right to reject any bid if the evidence submitted by, or the investigation of such bidder fails to satisfy the County, in the County's sole discretion, that it is properly qualified to carry out the obligations of the contract and to complete the contemplated work.

18. REQUIRED EXPERIENCE

The County requires that each contractor possess not less than five (5) year's experience in performing work substantially similar in scope and size to the work for which it is bidding. The contractor agrees that upon request of the County the contractor will furnish a detailed statement of each project that it has performed during the most recent five (5) years (including but not limited to the name and address of the project, the name of the awarding entity/owner, the name of the awarding entity's/owner's representative, a current telephone number where that representative can be reached, the description of the project, general scope of the contractor's work, contract price, dates of performance, whether the contract was terminated for cause or convenience, whether the contract was completed and whether liquidated damages were assessed against the contractor [and if so, provide a written explanation]). The County reserves the right to require additional information as it deems appropriate concerning the history of the contractor's performance of each such contract. The final determination of whether the contractor possesses the requisite experience rests in the sole discretion of the County.

19. INCREASE OR DECREASE OF QUANTITIES: ELIMINATION OF ITEMS

In entering into this contract, the Contractor agrees that quantities shown on the Proposal Pages opposite items of the work for which unit prices have been requested are approximate estimated quantities, and that during the progress of the work the County may find it advisable and shall have the right to omit portions of the work, and to increase or decrease the shown approximate estimated quantities, or the scope of the whole work; and that the County reserves the right to add to or take from the total amount of the work up to a limit of thirty percent of the total amount of the contract based upon the executed contract price for all the specified work.

The Contractor shall make no claim for anticipated profits or loss of profits, because of any difference between the quantities of the various classes of work actually done, or of the materials actually furnished, and the original specified scope of work and the shown approximate estimated quantities.

The aforesaid thirty- percent pertains to the total amount of the contract and not to any individual item. Individual items may be increased or decreased any amount or may be eliminated entirely if so ordered by the Commissioner, excepting that the total amount of the contract as adjusted shall not result in a net increase or decrease of more than thirty percent except by mutual agreement between both parties thereto.

The Contractor waives all claims of any nature due to a misunderstanding of the location, character, or other conditions surrounding the work or of the shown approximate estimated quantities of items of the work.

20. BREAKDOWN COST OF LUMP SUM ITEMS AND CONTRACTS

After award of the contract and prior to actual start of the work, the successful bidder shall submit an itemized schedule of its estimated costs of lump sum items and or lump sum total contract work, for approval by the County. The schedule shall be submitted as an outline series with minor subdivisions, in accordance with the directives of the County. As part of

this Schedule, the Contractor will be required to include a sum sufficient, as determined in the County's sole discretion, for the preparation and submission of approved final "As-builts", record drawings, guarantees, warranties, and operations and maintenance manuals.

21. ENGINEERING CHARGES

In addition to any and all other remedies available to the County when the work embraced in the contract is not completed on or before the date specified herein, engineering and inspection expenses incurred by the County of Westchester upon the work from the completion date originally fixed in the contract to the final date of completion of the work may be charged to the Contractor and be deducted from monies due the Contractor. Consideration of any extra work or supplemental contract work added to the original contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the County before assessing engineering and inspection charges against the Contractor. Such charges will be assessed, however, in cases where in the opinion of the Commissioner, the Contractor has delayed the work.

22. ESTIMATES AND PAYMENTS

As the work progresses but not more often than once a month and then on such days as the Construction Administrator may fix, the Contractor will submit a requisition in writing of the amount and value of the work performed and the materials and equipment provided to the date of the requisition, less any amount previously paid to the Contractor. The Contractor must complete at least ten (10%) percent of the work before submitting any claims for mobilization. From each requisition, the County will retain five percent (5%) plus one hundred fifty percent (150%) of the amount necessary to satisfy any claims, liens or judgments against the Contractor that have not been suitably discharged. The Commissioner will thereupon cause the balance of the requisition therein to be paid to the Contractor. In lieu of all or part of the cash retainage the County shall only accept bonds or notes of United States of America, New York State or political subdivisions thereof. As a condition to the making of any progress payment as set forth in this paragraph, the County, in its sole discretion may require the Contractor to submit such document as may be reasonably required to establish that the Contractor (and its subcontractor(s)) have timely and properly paid their respective subcontractor(s) and materialmen of whatever tier.

VENDOR DIRECT PAYMENT: All payments made by the County to the Contractor will be made by electronic funds transfer ("EFT") pursuant to the County's Vendor Direct program. The Contractor is required to complete the Vendor Direct Payment Authorization Form, which is located in the Forms Section on page 11 and 12. Payments will be automatically credited to the Contractor's designated bank account at the Contractor's financial institution. Payments are anticipated to be deposited two business days after the voucher/invoice is processed for payment. Saturdays, Sundays, and legal holidays are not considered business days. Under the Vendor Direct program you will receive an e-mail notification two days prior to the day the payment will be credited to your designated account. The e-mail notification will come in the form of a remittance advice with the same information that currently appears on County check stubs and will contain the date that the funds will be credited to your account. If there is a discrepancy in the amount received please contact

your Westchester County representative as you would have in the past if there were a discrepancy in a check.

In the unlikely event that you do not receive the money in your designated bank account on the date indicated in the e-mail, please contact the Westchester County Accounts Payable Department at 914-995-3748. Whenever you change your bank or change or close your account a new Vendor Direct Payment Authorization Form must be submitted. Please contact the Westchester County Accounts Payable Department at 914-995-3748 and a new form will be e-mailed to you. When completing the payment authorization form you must either supply a voided check or have it signed by a bank official to ensure the authenticity of the account being set up to receive your payments. Failure to return the completed authorization form prior to award of the contract may result in the bid being considered non-responsive and the bid may be rejected.

When the work or major portion thereof, as contemplated by the terms of the contract (see Substantial Completion Payment and Final Payment later in this article), are substantially completed in the judgment of the Commissioner, the Contractor shall submit a requisition for the remainder of the contract balance. An amount equal to two (2) times the value of the remaining items to be completed plus one hundred fifty percent (150%) of the amount that the Commissioner deems necessary to satisfy to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged shall be deducted from the requisition. As the remaining items of work are satisfactorily completed or corrected, the County will, upon receipt of a requisition, pay for these items less one hundred fifty percent (150%) of the amount necessary to satisfy any claims, liens or judgments.

Contractor agrees, in the event of any withdrawal by the contractor of amounts retained from payments to the contractor pursuant to the terms hereof, that notwithstanding any contrary interpretation of Section 106 of the New York General Municipal Law, the contractor will be obliged to maintain the market value of securities deposited in an amount equal to the amount withdrawn pursuant to said Section 106. The Contractor will, within five (5) days of demand therefore by the fiscal officer of the County, deposit with such fiscal officer cash, or securities of the kind provided in Section 106, of a market value sufficient to maintain the market value of all securities on deposit at a level equal (as of the date such notice of the fiscal officer is given to the contractor) to the amount which the County shall be entitled to retain from payments to the contractor pursuant to the terms of the contract.

All estimates will be made for actual quantities for work performed and materials and equipment incorporated in the work as determined by the measurements of the Engineer, and this determination shall be accepted as final, conclusive and binding upon the Contractor. All estimates will be subject to correction in any succeeding estimate.

Payment will be made for materials pertinent to the project which have been delivered to the site or off-site by the Contractor and/or Subcontractor and suitably stored and secured in first-class condition as required by the Construction Administrator. Payment may be limited to materials in short and/or critical supply and materials specially fabricated for the project, as defined by the contract. Payment will be made only upon the written request of the contractor. The Contractor must submit certified copies of the manufacturer's or vendor's invoices or statements establishing the true purchase value of the material or equipment; freight bills, release of liens and certificate of insurance covering all equipment and materials. Then the County will include in the following monthly payment an amount not to

exceed the lesser of the bid breakdown or the total purchase price of the stored equipment and materials less retainage provided that such equipment and materials are suitable for their intended use.

The Contractor shall be responsible for safeguarding stored equipment and materials against loss or damage of any nature whatsoever, shall retain title until incorporated into the work and acceptance by the County and in case of loss or damage, the Contractor shall replace such lost or damaged equipment and materials at no cost to the County.

After receipt of payment, the Contractor shall not remove from the site equipment and materials for which such payment was made without written authorization from the Commissioner.

No major equipment item shall be brought to the site until the following conditions are met:

1) The County must have received the manufacture's recommendations for on-site storage in writing.

2) The structure in which the equipment is to be installed is roofed (roofing must be watertight) and has such protection of doorways, windows, and other openings that will provide reasonable protection from the weather.

3) Prior to the County making a Partial Payment on a major equipment item the following conditions must be met:
   a. The Contractor must certify to the County, in writing, that the equipment has been properly stored.
   b. The Shop Drawings must be approved and the draft Operation and Maintenance Manuals must have been submitted.

The Contractor shall furnish to the Construction Administrator, prior to the making up of any Partial or Final Estimate, a copy of its and its Subcontractors' weekly payrolls for each and every preceding payroll period. The payroll submitted shall be a certified true copy and shall contain full information including but not limited to the number of hours worked, rate, classification and total sum paid each employee charged to or working on the job. With all except the first estimate, the Contractor shall furnish to the Construction Administrator a sworn statement listing all unpaid bills and liabilities incurred under the Contract.

A. Substantial Completion Payment

1) Within thirty (30) days after receiving written notice from the Contractor of substantial completion of the work under this Agreement, the Commissioner will cause an inspection to be made of the work done under this contract. If, upon such inspection, the Engineer determines that the work is substantially complete, a Substantial Completion Payment to the Contractor for the work done under this Contract, less any and all deductions authorized to be made by the Commissioner under this contract or by law, will be issued.

2) Such a Payment shall be considered a Partial and not a Final Payment.

3) As a condition precedent to receiving payment therefore, the Contractor must have received County approval of all Shop Drawing submittals, the Operation and Maintenance Manuals, and As-Built Drawing(s). Together with its application for substantial completion payment the Contractor shall also deliver to the

Construction Administrator a verified statement certifying that all claims or liabilities arising from the completed work, including all charges for Extra Work, Change Orders, additional time, damages or credits (collectively referred to as "claims") have been presented to the County. All such claims shall be described in sufficient detail so as to be easily identified. The Contractor's failure to submit the verified statement shall constitute a full and final waiver of all claims against the County from the beginning of the project through the date of substantial completion as established by the County. The presentation of the verified statement to the County shall not constitute an acknowledgement by the County that any such claim is valid. The County expressly reserves its right to assert that any such claim(s) is waived or precluded by reason of other provisions of the contract documents. Only claims particularly identified on the Contractor's verified statement shall be preserved; all other claims whatever nature shall be deemed waived and released. It shall also submit proof of title of the materials and equipment covered by the contract. The Contractor shall also, prior to the issuance of said Substantial Completion Payment, supply to the County affidavits and certificates for labor, material and equipment (where applicable).

B. Final Payment

1) Within ten (10) days after receiving written notice from the Contractor of completion of all the work, the Engineer will make a final inspection. If upon inspection the Engineer determines that no further work is needed, the Commissioner will request that the Board of Acquisition and Contract approve the completion of the project and authorize payment of the Final Estimate. Also required prior to the Board of Acquisition and Contract approval is a Condition Report by the Contractor that any damage of public or privately owned properties resulting from the Contractor's work has been satisfactorily repaired.

2) As a condition precedent to receiving Final Payment therefore the Contractor shall submit a supplementary verified statement similar to that required under, "A. Substantial Completion Payment", hereof. This verified statement must include only those charges for Extra Work, Change Orders, additional time, damages or credits (collectively referred to as "claims") that accrued between substantial completion and final completion. The Contractor's failure to submit the verified statement shall constitute a full and final waiver of all claims against the County from the beginning of the project through the date of substantial completion as established by the County. The presentation of the verified statement to the County shall not constitute an acknowledgement by the County that any such claim is valid. The County expressly reserves its right to assert that any such claim is waived or precluded by reason of other provisions of the contract documents. Only claims particularly identified on the Contractor's supplementary verified statement shall be preserved; all other claims of whatever nature shall be deemed waived and released.

3) The Contractor shall also, prior to the issuance of Final Payment, supply to the County affidavits and certificates for labor, material and equipment (where applicable).

4) The County will, not less than thirty (30) days after the Final Acceptance of the work under this contract, by the Board of Acquisition and Contract, pay the Contractor upon the receipt of all required documentation the balance of funds due thereunder after deduction of all previous payments, liens and all percentages and amounts to be kept and retained under provision of this contract.

   All prior Partial Payments, being merely estimates made to enable the Contractor to prosecute the work more advantageously, shall be subject to correction in the Final Estimate and Payment

5) The acceptance by the Contractor or by anyone claiming by or through him of the Final Payment shall operate as and shall be a release to the County and every officer and agent thereof, from any and all claims of the Contractor for anything done or furnished in connection with this work or project and for any act or omission of the County or of any others relating to or affecting the work. No payment, however, final or otherwise, shall operate to release the Contractor or its Sureties from any obligation under this contract or the Performance and Payment Bond. Should the Contractor refuse to accept the final payment as tendered by the County, it shall constitute a waiver of any rights to interest thereon. Nor shall refusal to accept final payment extend any applicable statute of limitation.

23. PAYMENTS TO SUBCONTRACTORS AND MATERIALMEN BY CONTRACTOR

Within fifteen calendar days of the receipt of any payment from the County, the contractor shall pay each of its sub-contractors and materialmen the proceeds from the payment representing the value of the work performed and/or materials furnished by the subcontractor and/or materialmen as reflected in the payment from the owner less an amount necessary to satisfy any claims, liens or judgment against the subcontractor or materialman which have not been suitably discharged and less any retained amount as hereafter described. The contractor shall retain not more than five per centum of each payment to the subcontractor and/or materialman except that the contractor may retain in excess of five per centum but not more than ten per centum of each payment to the subcontractor provided that prior to entering into a subcontract with the contractor, the sub-contractor is unable or unwilling to provide a performance bond and a labor and material bond both in the full amount of the sub-contract at the request of the contractor. However, the contractor shall retain nothing from those payments representing proceeds owed the subcontractor and/or materialman from the County's payments to the contractor for the remaining amounts of the contract balance as provided in Article “Estimates and Payments” of the Information For Bidders. Within fifteen calendar days of the receipts of payment from the contractor, the subcontractor and/or materialman shall pay each of its subcontractors and materialmen in the same manner as the contractor has paid the subcontractor.

Nothing provided herein shall create any obligation on the part of the County to pay or to see the payment of any moneys to any subcontractor or materialman from any contractor nor shall anything provided herein serve to create any relationship in contract or otherwise, implied or expressed between the subcontractor or materialman and the County. Notwithstanding anything to the foregoing, the County may tender payments to the Contractor in the form of joint or dual payee checks.

NOTICE: No direct payment will be made for work done or materials furnished under the General Clauses, Information for Bidders, General Clauses and Special Clauses, except where expressly stated elsewhere, but compensation shall be deemed to be included in the contract lump sum price for the total work and/or the contract unit prices for the various items of the work.

24. TIME OF STARTING

Time being of the essence, all bidders shall take notice that the timely completion of the work called for under this contract is of the greatest importance. The contractor shall commence its work within ten (10) days after "notice to proceed" has been given it by the Commissioner (unless a definite starting date is stated). Prior to commencing its work, the Contractor shall notify the Director of Project Management, Division of Engineering and Department of Public Works, at least forty-eight (48) hours prior to the planned date of its "start", so that a Construction Administrator can be assigned to the work.

25. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION AND DEMOLITION WORK

At all times the Contractor shall use all required and necessary precautions for the safety and protection of the public, County personnel, construction employees, and private and public property on or adjacent to the work.

The Contractor shall comply fully with all the applicable provisions of the following listed governmental regulations and standards, noting that in case of conflict, the Contractor shall comply with the most stringent rule or regulation:

1) State of New York, Department of Labor, Bureau of Standards and Appeals, Industrial Code Rule 23 "Protection of Persons Employed in Construction and Demolition Work."

2) United States Department of Labor, Bureau of Labor Standards, "Safety and Health Regulations for Construction," as promulgated in accordance with the Occupational Safety and Health Act of 1970, Public Law 91-596; 84 Stat. 1590, Laws of 91st Congress - 2nd Session.

It shall be the sole responsibility of the Contractor to ascertain which of the regulations and standards contained in the foregoing listed publications effect its construction activities, and it shall be solely responsible for the penalties resulting from its failure to comply with such applicable rules and regulations. Copies of the listed publications are available for reference purposes only, in the Westchester County Department of Public Works, Division of Engineering, Design Section, Room 500, Michaelian Office Building, White Plains, New York.

The West Nile Mosquito control program:

1) Routinely, the work site should be inspected for potential habitats (i.e. stagnant/standing water) for mosquitoes.

2) Conditions that would require remediation include: improper site grading, ruts/other depressions, water in debris (i.e. containers, tires, etc.), stored or

discarded materials, and excavations, and those cited by the Construction Administrator.

3) Under the direction of the Construction Administrator, the Contractor shall take all necessary preventive and/or corrective action to eliminate the potential breeding grounds.

26. ACCIDENT PREVENTION AND FIRST AID FACILITIES

In addition to conforming to the applicable governmental regulations and standards referred to in Article “Fire Prevention And Control” of the Information For Bidders, the Contractor shall conduct its work in accordance with the recommendations contained in the latest edition of the "Manual of Accident Prevention in Construction," as published by the Associated General Contractors of America, Inc. and the most recent safety codes approved by the American Standards Association. In case of the conflict with the referenced governmental regulations and standards, the most stringent regulation, standard or recommendation shall govern.

Further, and without in any way limiting the Contractor’s obligations hereunder, and in accordance with the instructions of the Construction Administrator, the Contractor shall provide barricades, warning lights, danger and caution signs and other safeguards at all places where the work in any way is a hazard to the public.

The Contractor shall also provide and maintain upon the site at each location where major work is in progress, a completely equipped first aid kit that shall be readily accessible when construction activities are in progress. Posted on each first aid kit shall be the name, location and telephone number of the nearest hospital or doctor with whom the Contractor has previously made arrangements for emergency treatment in case of accident.

27. FIRE PREVENTION AND CONTROL

The Contractor shall abide by such rules and instructions as to fire prevention and control as the municipality having jurisdiction may prescribe. It shall take all necessary steps to prevent its employees from setting fires not required in the construction of the facility and shall be responsible for preventing the escape of fires set in connection with the construction.

It shall at all times provide the proper housekeeping to minimize potential fire hazards, and shall provide approved spark arresters on all steam engines, internal combustion engines and fuels.

Free access to fire hydrants and standpipe connections shall be maintained at all times during construction operations, and portable fire extinguishers shall be provided by the Contractor and made conveniently available throughout the construction site. The Contractor shall also notify its employees of the location of the nearest fire alarm box at all locations where work is in progress.

28. STATE AND LOCAL SALES TAX EXEMPTION

The Contractor's attention is directed to Section 1115 of the Tax Law of New York State, Chapters 513 and 514 of the Laws of 1974. In connection with capital improvement contracts entered into on or after September 1, 1974, all tangible personal property which will become an integral component of a structure, building or real property of New York State, or any of its political sub-divisions, including the County of Westchester, is exempt from State and local retail sales tax and compensating use tax.

Bidders' proposals shall exclude dollar amounts for the payment of State and Local retail sales tax and compensating use tax, for tangible personal property defined above.

The successful bidder shall be obliged to file the required Contractor Exempt Purchase Certificates, which may be obtained from the New York State Department of Taxation and Finance (1-800-462-8100), in order to utilize such exemption.

29. APPRENTICES

The attention of all bidders is directed to Section 220(3-e) of the New York State Labor Law, which is hereby incorporated herein by reference, which requires, among other things, that "Apprentices who are registered under a Bona Fide New York State Registered Apprentice Training Program shall be permitted to work."

30. AFFIRMATIVE ACTION PROVISION

During the performance of this Contract, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age or handicap. Contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, national origin, age or handicap. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoffs or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to include, or require the inclusion of the above provision in any subcontract made pursuant to its contract with the County.

31. AFFIRMATIVE ACTION PROGRAM REQUIREMENT

Relative to the award of this Contract, it is required that all bidders completely answer all questions contained in the questionnaire entitled "Affirmative Action Program Requirement" of the Proposal Pages, and properly attest to same.

It is also required that all subcontractors completely answer all questions contained in the questionnaire entitled " Affirmative Action Program Requirement-Subcontractors" of the Sample Forms, and properly attest to same. This form is to be submitted with the request to utilize subcontractor(s).

32. AUTHORITY TO DO BUSINESS IN NEW YORK

Any corporation not incorporated under the Laws of New York State, must furnish a copy of its certificate of authority, from the New York State Secretary of State, to do business in the State of New York, in accordance with Article 13 of the New York State Business Corporation Law.

33. LICENSE REQUIREMENTS (ELECTRICAL)

A. In accordance with the requirements of Local Law No. 20-1997 of Westchester County, no person shall perform work under any contract with the County of Westchester except (i) a licensed Master Electrician; (ii) a licensed "Special Electrician"; or (iii) a Journeyman Electrician working under the direct supervision and control of a Master Electrician.

In no event shall the County incur any liability to pay for any electrical work performed in violation of the licensing requirements of Local Law No. 20-1997 of Westchester County.

B. Contract with separate bids:

If the project is one where separate bid specifications are required pursuant to the provisions of the New York General Municipal Law, then any person, partnership, corporation, business organization or other business entity submitting a bid for the electrical portion of the project must possess, at the time of submission of the Bid, a valid Master/"Special" Electrician's license issued by the Westchester County Electrical Licensing Board in accordance with Chapter 277 Article XVII of the Laws of Westchester County and the Westchester County Electrical Licensing Board Rules & Regulations, in particular No. 11, which states as follows:

> No individual holding a Master Electrician's License shall lend such License to any person or allow any other person to carry on, engage in, or labor at the business as defined herein of installing, removing, altering, testing, replacing, or repairing electrical systems. A violation of this section by any person holding a License shall be sufficient cause for revocation of such License.
>
> However, nothing herein shall be construed to prohibit the use of a License by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that fifty-one (51) percent or more of the control of the voting capital stock of such partnership, corporation, or other business association is owned by one (1) or more holders of a Westchester County Master Electrical License and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such License holder or holders.

C. Contract with single bid:

Where the project does not involve separate bids pursuant to the New York General Municipal Law but where some electrical work is contemplated along with other work, the person, firm, partnership or corporation engaged to perform said electrical work

must possess a valid Master/"Special" Electrician's license issued by the Westchester County Electrical Licensing Board.

D. An electrical bidder must complete the "Certificate of License (Electrical)" of the Proposal Pages and will be required to furnish a copy of such license with the sealed Bid. Other bidders will be required to furnish a copy of such license for the applicable person engaged to perform the electrical work when request by the County, prior to awarding the contract.

E. The license must be maintained at all times during the performance of the work contemplated under the contract. The suspension, revocation or the failure to maintain or renew such license shall, in addition to any other right or remedy available to the County, be grounds for immediate termination of the contract, effective immediately upon notice from the Commissioner.

34. LICENSE REQUIREMENTS (PLUMBING)

A. In accordance with the requirements of Chapter 277, Article XV of the Laws of Westchester County, no person shall perform plumbing work under any contract with the County of Westchester except (i) a licensed Master Plumber; (ii) a certified Journey Level Plumber employed by and under the direction of a licensed Master Plumber; or (iii) an Apprentice Plumber working under the direct supervision and control of a Master Plumber or under the direct supervision and control of a certified Journey Level Plumber in the employ of a licensed Master Plumber.

In no event shall the County incur any liability to pay for any plumbing work performed in violation of the licensing requirements of Chapter 277, Article XV of the Laws of Westchester County.

B. Contract with separate bids:

If the project is one where separate bid specifications are required pursuant to the provisions of the New York General Municipal Law, then any person, partnership, corporation, business organization or other business entity submitting a bid for the plumbing portion of the project must possess, at the time of submission of the Bid, a valid Master Plumber's license issued by the Westchester County Board of Plumbing Examiners in accordance with the Westchester County Board of Plumbing Examiners Rules and Regulations and Chapter 277 Article XV of the Laws of Westchester County, in particular Section 277.509A, which states as follows:

> A. No holder of a license or certification issued under this article shall authorize, consent to or permit the use of his or her license or certification by or on behalf of any other person. No person who has not qualified or obtained a license or certification under this article shall represent himself or herself to the public as holder of a license or certification issued under this article, either directly, by means of signs, sign cards metal plates or stationery, or indirectly in any other manner whatsoever. However, nothing herein shall be construed to prohibit the use of a license by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that 51 percent or more of the control of the voting capital stock of such partnership, corporation or other business

association is owned by one or more holders of a Westchester County master plumbing license and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such license holder or holders.

C. Contract with single bid:

Where the project does not involve separate bids pursuant to the New York General Municipal Law but where some plumbing work is contemplated along with other work, the person, firm, partnership or corporation engaged to perform said plumbing work must possess a valid Master Plumber's license issued by the Westchester County Board of Plumbing Examiners.

D. A plumbing bidder must complete the "Certificate of License (Plumbing)" of the Proposal Pages and will be required to furnish a copy of such license and the County issued identity badge with the sealed Bid. Other bidders will be required to furnish a copy of such license and the County issued identity badge for the applicable person engaged to perform the plumbing work when request by the County, prior to awarding the contract.

E. A restricted Master Plumber's license issued by the Westchester County Board of Plumbing Examiners shall satisfy the requirements of this section provided such restricted license authorizes the Master Plumber to engage in the business of plumbing within the local municipality in which the work under the contract is to be performed.

F. The license must be maintained at all times during the performance of the work contemplated under the contract. The suspension, revocation or the failure to maintain or renew such license shall, in addition to any other right or remedy available to the County, be grounds for immediate termination of the contract, effective immediately upon notice from the Commissioner.

35. LICENSE REQUIREMENTS (HAULERS)

(Haulers Of Solid Waste; Recyclables; Construction And Demolition Debris; Garden And Yard Waste And/Or Scrap Metal)

A. DEFINITIONS:

1) "Class A" refers to all haulers except those whose hauling business is limited solely to Class C, Class D or Class E activities or whose recycling business is limited to Class B activities. Class A Licensees may also conduct Class B, Class C, Class D and Class E activities.

2) "Class B" refers to Recyclable brokers. Class B Licensees may also conduct Class C, Class D and Class E activities.

3) "Class C" refers to haulers who exclusively handle construction and demolition debris. Class C Licensees may also conduct Class D and Class E activities. With respect to Class C haulers, the following shall apply: a. Class "C-1" shall refer to a business or subsidiary which generates construction and demolition debris, as defined herein, and which, incidental to such business, transports, stores, processes, transfers or disposes of the construction and demolition debris generated by the

operations of such business or subsidiary. Class "C-1" Licensees may also conduct Class E activities; b. Class "C-2" shall refer to all other businesses which otherwise transport, collect, store, transfer, process, or dispose of construction and demolition debris. Class "C-2" haulers may also conduct Class "C-1", Class D and Class E activities.

4) "Class D" refers to (i) haulers who collect, store, transport, transfer, process or dispose of garden and yard waste generated, originated or brought within the County where such garden and yard waste was previously generated by a person or entity other than the Licensees and/or (ii) haulers who collect, store, transport, transfer, process or dispose of garden and yard waste and which own, lease, or control one or more vehicles having three (3) or more axles which vehicles will be used in the collection, storage, transfer, transportation, processing or disposal of garden and yard waste generated, originated or brought within the County.

5) "Class E" refers to haulers who exclusively conduct a scrap peddler business.

6) "Construction and Demolition Debris" means uncontaminated Solid Waste resulting from the construction, remodeling, repair and demolition of structures and roads, and uncontaminated Solid Waste consisting of vegetation resulting from land clearing and grubbing, utility line maintenance and seasonal and storm-related cleanup. Such waste includes, but is not limited to, bricks, concrete and other masonry materials, soil, rock, wood, wall coverings, plaster, drywall, plumbing fixtures, non-asbestos insulation, roofing shingles, asphaltic pavement, glass, plastics that are not sealed in a manner that conceals other waste, electrical wiring and components containing no hazardous liquids, metals, and trees or tree limbs that are incidental to any of the above.

7) "Hauler" means any person excluding municipalities, the County and any County district including, but not limited to, Refuse Disposal District No. 1 and all County sewer and water districts, who, for a fee or other consideration, collects, stores, processes, transfers, transports or disposes of Solid Waste, Recyclables or construction and demolition debris that is generated or originated within the County or brought within the boundaries of the County for disposal, storage, transfer or processing.

8) "Recyclables" means those materials defined as "Recyclables" under Section 825.30 (8) of the Westchester County Source Separation Law.

9) "Scrap Peddler" shall mean any person who collects scrap materials for sale to a Recyclable broker using no more than one vehicle for collection and transportation of such materials.

10) "Solid Waste" means all putrescible and non-putrescible materials or substances, except as described in Paragraph 4 of 6 NYCRR Part 360-1.2(a), and/or regulated under 6 NYCRR Part 364, that are discarded or rejected as being spent, useless, worthless or in excess to the owners at the time of such discard or rejection including, but not limited to, garbage, refuse, commercial waste, rubbish, ashes, incinerator residue and construction and demolition debris. "Solid Waste" shall not be understood to include Recyclables as defined above.

B. **PLEASE TAKE NOTICE -** In accordance with the requirements of Chapter 826-a, Article III of the Laws of Westchester County, it is unlawful for any person to collect, store, transfer, transport or dispose of solid waste; recyclables; construction and demolition debris; garden and yard waste and/or scrap metal, as defined herein, that is generated or originated within the County or brought within the boundaries of the County for disposal, storage, transfer or processing, or to conduct any activities defined as Class A, Class B, Class C, Class D or Class E activities under Chapter 826-a of the Laws of Westchester County, in Westchester County (hereinafter collectively referred to as "hauling") without having first obtained a license therefore from the Westchester County Solid Waste Commission.

In no event shall the County incur any liability with respect to any hauling activities conducted by the bidder or any subcontractor of the bidder in violation of Chapter 826-a of the Laws of Westchester County.

C. Where the project necessitates that hauling be performed, either the bidder or the person, partnership, corporation, business organization or other business entity engaged to perform such hauling work on behalf of the bidder (hereinafter the "subcontractor") must possess a valid license issued by the Westchester County Solid Waste Commission at the time of submission of the bid and throughout the duration of any contract issued pursuant thereto.

D. A hauler bidder must complete the “Certificate of License (Hauler)” of the Proposal Pages and will be required to furnish a copy of such license with the sealed bid. Other bidders will be required to furnish a copy of such license for the applicable person engaged to perform the hauling work when requested by the County, prior to awarding the contract.

E. The suspension, revocation, or the failure to maintain or renew such license may, in addition to any other right or remedy available to the County, be grounds for termination of the contract, effective immediately upon notice from the Commissioner. The bidder which is awarded the contract hereunder shall have a continuing obligation to notify the Commissioner, within (2) business days, of any suspension, revocation or other action taken with respect to any license issued by the Westchester County Solid Waste Commission which may limit or impair the bidder's ability, or the ability of any authorized subcontractor, to perform such hauling work in the County of Westchester.

It shall be the bidder's responsibility to ensure that any subcontractor who will perform the hauling services required under any contract issued pursuant to this bid specification has a valid license for the duration of the term of any contract awarded hereunder.

F. In the event that a license held by the bidder or its subcontractor is revoked, suspended or otherwise discontinued by the Westchester County Solid Waste Commission, or in the event that the bidder is otherwise required to obtain the services of a new or alternate subcontractor for the hauling work, the bidder shall immediately notify the Commissioner and seek the Commissioner's approval for the use of such subcontractor to provide the hauling services which are required under the contract, and shall provide the Commissioner with a copy of the license issued by the Westchester County Solid Waste Commission to such subcontractor. No bidder or subcontractor shall provide

hauling services under the contract until a copy of its license has been provided to the Commissioner and the Commissioner has approved of such bidder or subcontractor.

36. MINORITY PARTICIPATION POLICY

A. Pursuant to Chapter 308 of the Laws of the County of Westchester, the County encourages the meaningful and significant participation of business enterprises owned by persons of color and women - Minority Business Enterprise (MBE) and Women Business Enterprise(WBE); on County of Westchester contracts.

B. It is the goal of the County of Westchester to use its best efforts to encourage, promote and increase participation of business enterprises owned and controlled by persons of color or women (MBE/WBE) in contracts and projects funded by all departments of the County and to develop a policy to efficiently and effectively monitor such participation.

C. In recognition of the need to promote the development of business enterprises owned and controlled by persons of color and women to achieve a goal of equal opportunity, and overcome the existing under representation of these groups in the business community, the County of Westchester acting through its Office of Economic Development shall as a lawful public and County purpose provide technical and informational assistance to such business enterprises with a particular emphasis on education programs to encourage participation in the contract procurement process.

D. For the purposes of this Local Law, a business enterprise owned and controlled by women or persons of color shall be construed to mean a business enterprise including a sole proprietorship, partnership or corporation that is: (a) at least 51% owned by one or more persons of color or women; (b) an enterprise in which such ownership by persons of color or women is real, substantial and continuing; (c) an enterprise in which such ownership interest by persons of color or women has and exercises the authority to control and operate, independently, the day-to-day business decisions of the enterprise; and (d) an enterprise authorized to do business in this state which is independently owned and operated. In addition, a business enterprise owned and controlled by persons of color or women shall be deemed to include any business enterprise certified as an MBE or WBE pursuant to Article 15-a of the New York State Executive Law and implementing regulations, 9 NYCRR Subtitle N Part 540 et seq., or as a small disadvantaged business concern pursuant to the Small Business Act, 15 U.S.C. 631 et seq., and the relevant provisions of the Code of Federal Regulations as amended.

E. The Contractor hereby acknowledges and agrees:

1) That in the hiring of employees for the performance of work under this contract or any subcontract hereunder, no contractor, subcontractor, nor any person acting on behalf of such contractor or subcontractor, shall be reason of race, creed, color, religion, gender, age, ethnicity, disability, sex, alienage or citizenship status, national origin, marital status, sexual orientation, familial status, genetic predisposition or carrier status discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates;

2) That no contractor, subcontractor, nor any person on its behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, color, religion, gender, age, ethnicity, disability, sex, alienage or citizenship status, national origin, marital status, sexual orientation, familial status, genetic predisposition or carrier status;

3) That there may be deducted from the amount payable to the contractor by the County under this contract a penalty of fifty (50) dollars for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the contract;

4) That this contract may be canceled or terminated by the County, and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this section of the contract; and

5) The aforesaid provisions of this section covering every contract for or on behalf of the County for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of New York.

6) Contractor agrees to include, or require the inclusion of the above provision in any subcontract made pursuant to its contract with the County.

F. In furtherance of the Contractor's obligation to make documented good faith efforts to utilize Minority Business Enterprises (MBE) and Women's Business Enterprises (WBE) for the Work required by this Contract, the Contractor shall provide the Minority/Women Business Enterprise Questionnaire signed by an officer of the Contractor, and any additional information requested by the County, including but not limited to the following, which shall be delivered to the Construction Administrator and , Program Manager of Minority- and Women-Owned Business Program, County of Westchester, Room 911, 148 Martine Avenue, White Plains, New York 10601 coincident with the Contractor's delivery to the County of its bid and shall be provided by the Contractor with any request for approval of subcontractors:

1 (a) The name, address, telephone number and contact person of each MBE and WBE solicited verbally by Contractor during the applicable period for the performance of any portion of the Contractor's Work and the date(s) that each such solicitation was made;

1 (b) A description of the portion of the Contractor's Work for which each such solicitation is made.

1 (c) A listing of the project documents, if any, furnished to each such MBE and WBE.

2. A copy of each written solicitation sent by the Contractor to each MBE and WBE and the name and address of each MBE and WBE to whom the solicitation was made.

3) The name and address of each MBE and WBE that performs any portion of the Contractor's Work, a description of such portion of the Work and the dollar

amount therefore.

4) A statement that the Contractor reviewed a list of MBE and WBE contractors in their outreach efforts. A list can be found at www.westchestergov.com/mwob.

5) Indicate those MBE and WBE contractors found on the list that provided the type of subcontractor services required for this project. If none were found, please indicate.

6) Describe other outreach efforts, including other MBE and/or WBE lists, organizations or individuals that were contacted.

The failure of the low bidder to comply with the provisions of this subparagraph F may result in the County NOT awarding this contract to your firm. Failure of the Contractor to comply with the provisions of this subparagraph F may constitute a material breach of this Contract. Failure to comply with the Minority Participation Policy may be considered by the County when awarding contracts.

37. SEXUAL HARASSMENT POLICY

A. As with discrimination involving race, color, religion, age, sexual orientation, disability, and national origin, Westchester County also prohibits sex discrimination, including sexual harassment of its employees in any form. The County will take all steps necessary to prevent and stop the occurrence of sexual harassment in the workplace.

1) **This policy applies to all County employees and all personnel in a contractual relationship with the County**. Depending on the extent of the County's exercise of control, this policy may be applied to the conduct of non-County employees with respect to sexual harassment of County employees in the workplace.

2) This sexual harassment policy includes, but is not limited to, inappropriate forms of behavior described by the Equal Employment Opportunity Commission.

B. Sexual advances that are not welcome, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitutes sexual harassment when:

1) Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment; -OR-

2) Submission to or rejection of such conduct by an individual is used as the basis for employment decisions, such as promotion, transfer, or termination, affecting such individuals; -OR-

3) Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile or offensive working environment.

C. Sexual harassment refers to behavior that is not welcome, that is personally offensive, that fails to respect the rights of others, that lowers morale and that, therefore, interferes

with an employee's work performance and effectiveness or creates an intimidating, hostile or offensive working environment.

38. SMOKE-FREE WORKPLACE POLICY

A. By way of Executive Order No. 5 of 1998 and Local Law 3 of 2003, it is now the policy of the County of Westchester to institute a smoke-free "workplace".

B. Every indoor County "workplace", shall become a smoke-free area. The smoking or carrying of lighted cigarettes, cigars, pipes, or any other tobacco-based products, or products that result in smoke, is hereby banned.

C. Every indoor County "workplace" shall be covered under this Executive Order, including the County Jail in Valhalla and the Westchester County Center in White Plains. This Executive Order shall not, however, apply to County-owned facilities that are not County "workplaces", such as employees housing or privately run restaurants on County property (e.g. at the County golf courses).

D. The Richard J. Daronco County Courthouse shall not, for purposes of this Executive Order, be considered a County "workplace", and therefore shall not be required to be smoke-free.

E. This Executive Order is intended to be consistent with, and not modify, any provisions of the New York State Public Health Law.

F. This Executive Order shall take effect immediately and remain in full force and effect until otherwise superseded or revoked.

39. COUNTY ENERGY EFFICIENT PURCHASING POLICY

A. By way of Executive Order No. 9 of 2002, it is now the policy of the County of Westchester to institute an Energy Efficient Purchasing Policy.

B. This policy shall apply to all purchases made by and for the County in accordance with applicable laws, rules and regulations.

C. Wherever the price is reasonably competitive and the quality adequate for the purpose intended, purchase and utilization of products that meet Energy Star requirements for energy efficiency as determined by the United States Environmental Protection Agency and the United States Department of Energy is hereby recommended.

D. If the Energy Star label is not available with respect to a particular product, than it is recommended that products in the upper twenty-five percent of energy efficiency as designated by the United States Federal Energy Management Program shall be purchased and utilized if the prices of those products are reasonably competitive and the quality adequate for the purpose intended.

40. RESTRICTION ON USE OF TROPICAL HARDWOODS

A. The bidder/proposer shall not use or propose to use any tropical hardwoods or tropical hardwood products in any form, except in accordance with State Finance Law § 165 (Use of Tropical Hardwoods), as may be amended from time to time. Pursuant to the

State Finance Law § 165, any bid/proposal which proposes or calls for the use of any tropical hardwood or wood product in the performance of the contract shall be deemed non-responsive.

41. DISCLOSURE OF RELATIONSHIPS TO COUNTY

A. The successful bidder is required to complete the form entitled "Required Disclosure of Relationships to County" on Proposal Pages 32-33 before award of the contract.

B. In the event that any information provided on the completed Proposal Pages entitled "Required Disclosure of Relationships to County" changes during the term of this agreement, the Contractor shall notify the Commissioner in writing within ten (10) days of such event by submitting a revised "Required Disclosure of Relationships to County" form.

42. CONTRACTOR DISCLOSURE STATEMENT

The Contractor and each Major Subcontractor represents that all information provided by the Contractor and Major Subcontractor in the form entitled "Contractor Disclosure Statement" on Proposal Pages 23-31 is in all respects true and correct. In the event the information provided on that document changes during the term of this agreement or for a period of three (3) years after the date that the Contractor and/or the Major Subcontractor receives final payment under this agreement, the Contractor and/or Major Subcontractor shall notify the Commissioner in writing within ten (10) days of such event by submitting a revised "Contractor/Major Subcontractor Disclosure Statement". Bidders must complete the Required Disclosure of Relationships to County form. The Required Disclosure of Relationships to County form is located on Proposal Pages 32-33.

43. CRIMINAL BACKGROUND INFORMATION

Pursuant to Executive Order 1-2008 and subject to the applicable provisions of New York Correction Law §§ 752 and 753, the County shall have the right to bar the following "Persons Subject to Disclosure" (Persons shall mean individuals or legal entities) from providing work or services to the County or from being on County property:

(a) Consultants, Contractors, Licensees, Lessees of County owned real property, their principals, agents, employees, volunteers or any other person acting on behalf of said Contractor, Consultant, Licensee, or Lessee who is at least sixteen (16) years old, including but not limited to Subconsultants, Subcontractors, Sublessees or Sublicensees who are providing services to the County; and

(b) Any family member or other person, who is at least sixteen (16) years old, residing in the household of a County employee who lives in housing provided by the County located on County property.

If any of the above mentioned Persons Subject to Disclosure has either one of the following:

(a) A conviction of a crime (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State);

(b) A pending criminal proceeding for a crime(s) as defined above; or

(c) A refusal to answer such questions.

Where the following criteria apply:

(a) If any of the Persons Subject to Disclosure providing work or services to the County in relation to a County Contract are not subject to constant monitoring by County staff while performing tasks and/or while such persons are present on County property pursuant to the County Contract; and

(b) If any of the Persons Subject to Disclosure providing work or services to the County, in relation to a County Contract may, in the course of providing those services, have access to sensitive data (for example, Social Security Numbers and other personal/secure data); facilities (secure facilities and/or communication equipment); and/or vulnerable populations (for example, children, seniors and the infirm).

Accordingly, the Contractor is required to review the Instructions found in the instructions and complete "Contractor and all persons subject to Disclosure Certification Forms" located at Forms Pages 11-13 as well as any other applicable criminal disclosure forms (i.e., Forms Pages 14 through 19," together with Forms Pages 11-13 collectively referred to as "Disclosure Forms").

However, the following Persons Subject to Disclosure are **exempt** from Executive Order 1-2008: (i) those persons for whom the County has already conducted a background check and issued a security clearance that is in full force and effect; or (ii) those persons for whom another state or federal agency having appropriate jurisdiction has conducted a security and/or background clearance or has implemented other protocols or criteria for this purpose that apply to the subject matter of this Contract that is in full force and effect.

If a Person Subject to Disclosure is exempt from the disclosure described in Executive Order 1-2008 because of either "i" or "ii" above, then the Contractor shall notify the Procuring Officer[1] in the respective Department of its claim of exemption and it shall be the responsibility of the Procuring Officer to verify each exemption. If the Procuring Officer determines that the Contractor is exempt under sections "i" or "ii" above, the Procuring Officer shall confirm same with the Contractor and maintain a written record including all supporting details of the verification of and acknowledgement of said exemption.

If the Procuring Officer determines that the Contractor is not exempt under sections "i" or "ii" above, the Procuring Officer shall notify the Contractor in writing, and the appropriate Disclosure Forms shall be required.

It shall be the Contractor's duty to disclose and to inquire of each and every Person Subject to Disclosure, whether they have been convicted of a crime or whether they are currently subject to pending criminal charges. It shall be the duty of the Contractor to submit a completed Certification Form "Forms Pages 11-13"annexed hereto as ," which certifies that the Contractor and every Person Subject to Disclosure has been asked whether they have been convicted of a crime or are currently subject to pending criminal charges.

Should the Contractor or any Person Subject to Disclosure (also referred to as "Person")

[1] "Procuring Officer" shall mean the head of the department or the individual(s) authorized by the head(s) of the department(s) undertaking the procurement and with respect to those matters delegated to the Bureau of Purchase and Supply pursuant to Section 161.11(a) of the Laws of Westchester County, the Purchasing Agent.

affirmatively advise that they have been convicted of a crime said Person shall be identified in Forms Page 14 entitled "Names And Titles Of Persons Subject To Disclosure That Answered Yes" to any questions on Forms Pages11-13 and shall complete Forms Pages 15-16 entitled, "Criminal Background Disclosure Form For Persons Who Have Been Convicted of A Crime."

Should the Contractor or any Person Subject to Disclosure advise that they are subject to pending criminal charges, said Person shall be identified in Forms Page 14 and shall complete the form annexed hereto as Forms Pages 17-18 entitled, "Criminal Background Disclosure Form For Persons Who Are Subject to Pending Criminal Charges."

Should the Contractor or any Person Subject to Disclosure refuse to answer whether they have been convicted of a crime or are currently subject to pending criminal charges, the name and title of said Person(s) shall be listed on Forms Page 19 entitled "Persons That refused To Answer".

It shall be the duty of the Contractor to submit to the Procuring Officer all of the attached applicable Disclosure Forms prior to the commencement of this Contract. It is the responsibility of each Contractor to assure that all of their proposed Subcontractors complete the criminal background and disclosure certification forms and submit the forms to the Procuring Officer before they will be approved to perform work on the contract.

Under no circumstances shall the existence of a language barrier serve as a basis for the waiver of or an exception to this obligation. If the Contractor needs to obtain translation services to fulfill this obligation, it shall be at the sole cost and expense of the Contractor.

The Contractor shall be required to make the same inquiry and forward updated Disclosure Forms to the Procuring Officer regarding additional Persons Subject to Disclosure in connection with this Contract during the term of this Contract. **NO NEW PERSON SUBJECT TO DISCLOSURE SHALL PERFORM WORK OR SERVICES OR ENTER ONTO COUNTY PREMISES UNTIL THE UPDATED DISCLOSURE FORMS ARE FILED WITH THE PROCURING OFFICER.**

THE CONTRACTOR HAS A CONTINUING OBLIGATION TO MAINTAIN THE ACCURACY OF THE DISCLOSURE FORMS FOR THE DURATION OF THIS CONTRACT, INCLUDING ANY AMENDMENTS OR EXTENSIONS THERETO AND SHALL PROVIDE ANY UPDATES TO THE PROCURING OFFICER AS NECESSARY TO COMPLY WITH THE DISCLOSURE REQUIREMENTS BY EXECUTIVE ORDER 1-2008.

Any failure by the Contractor to comply with the disclosure requirements of Executive Order 1–2008, absent proof of exemption deemed satisfactory by the County Procuring Officer, may be considered by the County, a material breach by the Contractor and may be grounds for immediate termination of this Agreement by the County.

44. MANDATORY OSHA CONSTRUCTION SAFETY AND HEALTH TRAINING

Pursuant to NYS Labor Law §220-h – On all public work projects of at least $250,000 all laborers, workers and mechanics employed, in the performance of the contract on the public work site, either by the contractor, sub-contractor or other person doing or contracting to do the

whole or a part of the work contemplated by the contract, are required to be certified as having successfully completed an OSHA construction safety and health course of at least 10 hours prior to performing any work on the project.

3. GENERAL CLAUSES

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

1. MATERIAL AND WORKMANSHIP

It is the intent of these specifications to require first-class work and new and best quality materials. For any unexpected features arising during the progress of the work and not fully covered herein the specifications shall be interpreted to require first-class work and materials, and such interpretations shall be binding upon the Contractor.

1) Upon award of the Contract, the Contractor shall furnish in writing to the Construction Administrator the sources of supply for concrete, and other materials that it proposes to use in the work, and material shall not be furnished from other sources of supply except after written approval by the Construction Administrator. The Contractor shall, before ordering equipment verify that Suppliers of equipment will provide the required warranties, guarantees, and maintenance services.

2. DEFINITIONS

COMMISSIONER - The head of the Department of Public Works of the County of Westchester.

CONSTRUCTION ADMINISTRATOR- The representative of the Commissioner of Public Works at the project site who, unless specifically designated otherwise in the Contract, shall in the first instance, make such determinations as are necessary for the expeditious completion of the Work, except for those determinations that are reserved to the Commissioner.

CONTRACT - Shall mean each of the various parts of these documents both as a whole or severally and except for titles, subtitles, headings and table of contents, shall include the Notice to Bidders, Information for Bidders, the Proposal, the Specifications, the Performance Bond, the Plans, the Contract Form, and all addenda and provisions required by law.

CONTRACTOR - Party of the second part to the Contract acting directly or through its agents, subcontractors, or employees, and who is responsible for all debts pertaining to and for the acceptable performance of the work for which it had contracted.

COUNTY - Party of the first part to the Contract as represented by the Board of Acquisition and Contract and the Commissioner of Public Works for the County of Westchester.

ENGINEER - An Engineer or Architect that designed the project and is serving as the duly authorized representative of the Commissioner of Public Works who, in addition to the duties set forth in the Contract, shall, in the first instance, make such determinations as are necessary to ensure the Contractor's compliance with its obligations for the preparation and submission of shop drawings and all other submittals required for the Work. If there is no Engineer the duties of the Engineer shall be performed by the Construction Administrator and all references in this

Agreement to the Engineer shall be deemed to mean the Construction Administrator.

MAJOR SUBCONTRACTOR- Subcontractors performing all or a portion of the work for Electrical; Heating, Ventilating and Air Conditioning; Fire Prevention; General Construction; and/or any Subcontractor whose subcontract price is equal to or greater than ten percent (10%) of the Contract Price.

OWNER - The County of Westchester.

PLANS - All official drawings or reproductions of drawings pertaining to the work or to any structure connected therewith.

SPECIFICATIONS - The body of directions, requirements, etc. contained in this present volume, together with all documents of any descriptions and agreements made (or to be made), pertaining to the methods(or manner) of performing the work or to the quantities and quality. Specifications shall also include the Notice to Contractors, Instructions to Bidders, Bond, Proposal and Contract Agreement.

SURETY - The corporate body, which is bound with and for the Contractor and which engages to be responsible for the faithful performance of the contract, and to indemnify the County against all claims for damages.

A.A.S.H.O. - American Association of State Highway Officials

A.R.E.A. - American Railway Engineering Association

A.S.T.M. - American Society for Testing Materials

A.W.W.A. - American Water Works Association

N.E.C. - National Electrical Code

N.E.M.A. - National Electric Manufacturers Association

3. BOUNDARIES OF WORK

The County will provide land or rights-of-way for the work specified in this Contract. Other contractors, employees or concessionaires of the county, may for all necessary purposes enter upon the work and premises used by the Contractor, and the Contractor shall give to other contractors and employees of the County all reasonable facilities and assistance for the completion of adjoining work.

4. OVERLAPPING WORK

The Contractor shall take notice that because of work on other contracts within and adjacent to the contract limits it may not have exclusive occupancy of the territory within or adjacent

to the contract limits, and that during the life of this contract the owners and operators of Public Utilities may make changes in their facilities.

The said changes may be made by utility employees or by contract within or adjacent to the contract limits and may be both temporary and permanent.

The Contractor shall cooperate with other Contractors and owners of various utilities and shall coordinate and arrange the sequence of its work to conform with the progressive operations of work already or to be put under contract. Cooperation with Contractors already or to be engaged upon the site is essential to properly coordinate the construction efforts of all Contractors, Utility Owners and Subcontractors engaged in work within and adjacent to the contract limits.

The Contractor shall coordinate the work of its various Subcontractors. Their respective operations shall be arranged and conducted so that delays are avoided. Where the work of the Contractor or Subcontractor overlaps or dovetails with that of other Contractors, materials shall be delivered and operations conducted so as to carry on the work continuously in an efficient and workmanlike manner. The Contractor shall coordinate its work to be done hereunder with the work of the other Contractor(s) and the Contractor shall fully cooperate with such other Contractor(s) and carefully fit its own work to that provided under other contracts as may be directed by the Construction Administrator. If the Construction Administrator shall determine that the Contractor is failing to coordinate its work with the work of the other Contractor(s) as the Construction Administrator has directed, then the Commissioner shall have the right, at its sole option, to withhold any payments otherwise due hereunder until the Construction Administrator's directions are complied with by the Contractor and/or deduct the costs incurred by the County due to the Contractor's failure or refusal to so cooperate. Delays or oversights on the part of the Contractor or Subcontractors or Utility Owners in performing their work in the proper manner thereby causing cutting, removing and replacing work already in place, shall not be the basis for a claim for extra compensation.

In the event of interference between operations of Utility Owners and other Contractors, or among the Contractors themselves, the Construction Administrator shall be the sole judge of the rights of each Contractor insofar as the sequence of work necessary to expedite the completion of the entire project, and in all cases its decision shall be final. The Contractor agrees that it has included in its unit prices bid for the various items of the contract the possible additional cost of performing the work under this contract because it may not have a clear site for its work and because of possible interference of roadway use, other Contractors and necessary utility work, and the necessity or desirability of opening certain sections of pavement to traffic before the entire work is completed. The County shall not be liable for any damages suffered by any Contractor by reason of another Contractor's failure to comply with the directions of the Construction Administrator, or by reason of another Contractor's default in performance or by any act or failure to act of any Utility Owner or anyone working on its behalf, it being understood that the County does not guarantee the responsibility or continued efficiency of any Contractor or Utility Owner and under no circumstances shall the County be liable to any Contractor or Utility Owner for any delays, interferences or any other impediment or hindrance to the Contractor's or Utility Owner's work .

Should the Contractor sustain any damage through any act or omission of any other contractor having a Contract with the County for the performance of work upon the site or of work which may be necessary to be performed for the proper prosecution of the work to be performed hereunder, or through any act or omission of a supplier or subcontractor of whatever tier of such contractor, the Contractor shall have no claim against the County for such damage, but shall have a right to recover such damage from the other contractor under the provision similar to the following provision that has been or will be inserted in the Contracts with such other contractors.

Should any other Contractor having or who shall hereafter have a Contract with the County for the performance of work upon the site sustain any damage through any act or omission of the Contractor hereunder or through the act or omission of any subcontractor of whatever tier of the Contractor, the Contractor agrees to reimburse such other Contractor for all such damages and to defend at his own expense any suit based upon such claim and if any judgment or claims against the County shall be allowed the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses, including attorney's fees, incurred by the County in connection therewith and to indemnify and hold the County harmless from all such claims.

The County's right to indemnification hereunder shall not be diminished or waived by its assessment against the Contractor of liquidated damages as may be provided elsewhere herein.

Delays in availability of any part of the site or any delays due to interference between the several Contractors and the Utility Owners shall be compensated for by the Construction Administrator solely through granting an extension of time in which to complete the work of the contract without assessment of Engineering charges. The Contractor in submitting its bid hereby agrees that it shall make no other claim against the County for any damages due to such delays or interference.

5. PROPER METHOD OF WORK AND PROPER MATERIALS

The Construction Administrator shall have the power in general to direct the order and sequence of the work, which will be such as to permit the entire work under this contract to be begun and to proceed as rapidly as possible, and such as to bring the several parts of the work to a successful completion at about the same time.

If at any time before the commencement or during the progress of the work the materials and appliances used or to be used appear to the Construction Administrator as insufficient or improper for securing the quality of work required, or the required rate of progress, he may order the Contractor to increase their efficiency or to improve their character, and the Contractor shall promptly conform to such order; but the failure of the Construction Administrator to demand any increase of such efficiency or improvement shall not release the Contractor from its obligation to secure the quality of work or the rate of progress specified.

6. CONTROL OF AREA

Unloading of materials and parking of equipment shall be subject to the orders of the Construction Administrator so far as he may find necessary for the protection and safety of the traveling public and the preservation of property.

7. PERMITS, FEES, ETC.

The County will obtain at its sole cost the necessary New York State Pollutant Discharge Elimination System ("SPDES") Permit and will sign the associated Notice of Intent ("NOI"). The Contractor and its subcontractors will sign the required Certification Statement (a copy of which is contained as Proposal Page) when it signs the contract.

All necessary permits from County, State or other concerned Public Authorities shall be secured at the cost and expense of the Contractor. It shall also give all notices required by law, ordinance, or the rules and regulations of the concerned Public Bureaus or Departments, and also as a part of the Contract, comply without extra charge or compensation with all State Laws and all other Ordinances or Regulations that may be applicable to this work. Contractor, however, shall first notify the Commissioner before proceeding with securing of all necessary permits and the giving of required notices.

8. TRAFFIC

The General Contractor shall be responsible for the Maintenance and Protection of traffic at all times until the date of completion and acceptance of its work.

During the whole course of the work the Contractor shall so conduct its work and operations so as to interfere with traffic passing the work as little as possible and effect by every reasonable means the safety and comfort of pedestrians, vehicles and vehicle passengers passing the work.

9. INSPECTION

The Contractor shall at all times provide convenient access and safe and proper facilities for the inspection of all parts of the work. No work, except such shop work as may be so permitted, shall be done except in the presence of the Construction Administrator or his/her assistants. No material of any kind shall be used upon the work until it has been inspected and accepted by the Construction Administrator. All materials rejected shall be immediately removed from the work and not again offered for inspection. Any materials or workmanship found at any time to be defective shall be remedied at once, regardless of previous inspection. The inspection and supervision of the work by the Construction Administrator is intended to aid the Contractor in supplying labor and materials in accordance with the specifications, but such inspection shall not operate to release the Contractor from any of its contract obligations.

10. STOPPING WORK

The Commissioner, Construction Administrator or Engineer may stop by written order any work or any part of the work under this contract if, in his/her opinion, the methods employed

or conditions are such that unsatisfactory work might result. When work is so stopped it shall not be resumed until the methods or conditions are revised to the satisfaction of the Commissioner, which must be signified in writing. The Contractor agrees to make no claim for increased costs arising from the issuance of any stop work order.

11. DIMENSIONS

Figured dimensions on the plans shall be given preference over scaled dimensions, but shall be checked by the Contractor before starting construction. Any errors, omissions or discrepancies shall be brought to the attention of the Engineer and his/her decision thereon shall be final.

12. PAYMENTS TO COUNTY

Wherever in the Contract Documents the Contractor is required to make a payment to the County, the Contractor agrees that the County has the option to withhold such sum(s) from payments otherwise due to the Contractor and that all such sums withheld shall be deemed not to be earned by the Contractor.

13. PROTECTION OF UTILITIES AND STRUCTURES

The Contractor shall be responsible for the preservation of all public and private underground and surface utilities/structures at or adjacent to the construction work; insofar as they may be endangered by the work. This shall hold true whether or not they are shown on the contract drawings. If they are shown on the drawings, the County does not guarantee their locations even though the information will be from the best available sources.

The Contractor shall give ample and reasonable notice to all private, corporate or municipal owners before work is done near their utility or structure; shall properly protect all utilities/structures encountered; shall at their expense repair/replace any items that are damaged; and shall proceed with caution to prevent undue interruptions to utility services.

Investigation and/or on-site mark-out, by the County, must be done prior to excavation work at the Valhalla Campus. This investigation/mark-out is to serve as a guide for the Contractor and does not absolve the Contractor from the responsibility to repair/replace identified or non-identified utilities/structures, at no cost to the County.

All excavation work performed at the Valhalla Campus requires the submission of a completed "Ground Penetration" form/sketch(es) will be distributed to the appropriate utility owners. Therefore, the Contractor should assume that no excavation work can be performed until approximately twenty (20) working days after submission of the form/sketch(es), but not prior to approval by the DPW-BO Superintendent of Buildings.

14. PROTECTION OF WATER RESOURCES & THE ENVIRONMENT

The Contractor is responsible to review the specifications and drawings as they relate to this Agreement to ascertain what procedures must be followed in order to comply with all applicable stormwater management, water quality control, erosion, and sediment control

laws, rules, regulations and permits. If the Contractor is of the opinion that any work required, necessitated, or contained in the specifications or otherwise ordered conflicts with the applicable stormwater management, water quality control, erosion, and sediment control laws, rules, regulations, procedures, and permits, including, without limitation, all applicable provisions of the New York State Stormwater Management Design Manual, and the New York Standards and Specifications for Erosion and Sediment Control as they may be amended from time to time, it must promptly notify the First Deputy Commissioner of the Department of Public Works in writing.

In addition to all other requirements contained in this Agreement, the Contractor recognizes and understands that it is an essential element of this Agreement that the Contractor complies with the County's policies to protect water resources and the environment. The Contractor must comply with all applicable stormwater management, water quality control, erosion, and sediment control laws, rules, regulations, permits, procedures and specifications, including, without limitation, all applicable provisions of the New York State Stormwater Management Design Manual,[1], the New York Standards and Specifications for Erosion and Sediment Control as they may be amended from time to time. All of these documents should be obtained from the New York State Department of Environmental Conservation to ensure that the Contractor has the latest version. It should be noted that the standards set forth in the New York State Stormwater Management Design Manual, and the New York Standards and Specifications for Erosion and Sediment Control apply to ALL work done for the County, regardless of the size of the project. In case of a conflict among the governmental regulations and standards, the most stringent regulation, standard or recommendation shall apply to the work done under this Agreement.

The Contractor and its subcontractors shall execute the required Stormwater Pollution Prevention Certification, which is located at Proposal Page 20. In addition, the Contractor acknowledges that if the work required under this Agreement requires that a State Pollutant Discharge Elimination System ("SPDES") permit be obtained from the New York State Department of Environmental Conservation, then the Contractor must comply with the terms and conditions of the SPDES permit for stormwater discharges from construction activities and the Contractor will not take any action or fail to take any necessary action that will result in the County being held to be in violation of said permit or any other permit. The Contractor shall cooperate with the County in obtaining the permit and comply with the SPDES permit and all other applicable laws, rules, regulations and permits.

The Contractor shall provide, as the Commissioner or his designee may request, proof of compliance with the County's policies to protect water resources and the environment, and all applicable stormwater management, water quality control, erosion and sediment control laws, rules, regulations, permits, procedures and specifications.

The Contractor is responsible to ascertain which of the laws, rules, regulations, permits and standards referenced above affect its construction activities, and the Contractor shall be solely responsible for all costs and expenses, including any penalties or fines, incurred by the County, due to the Contractor's failure to comply with such applicable laws, rules,

[1] available at http://www.dec.state.ny.us/website/dow/swmanual/swmanual.html - The location of this reference is provided to assist the Contractor; it does not relieve the Contractor from the obligation of obtaining and complying with the latest version of the document.

permits, regulations, standards and County policies. The Contractor shall be responsible to defend and indemnify the County from any and all claims resulting from the Contractor's failure to comply with the applicable laws, rules, regulations, permits, standards and County policies.

Failure of the Contractor to comply with the County's policies to protect water resources and the environment, and all applicable stormwater management, water quality control, erosion and sediment control laws, rules, regulations, permits, procedures and specifications may result in the withholding of progress payments to the Contractor by the County. Such withholding of progress payments shall not relieve the Contractor of any requirements of the Agreement including the completion of the work within the specified time, and any construction sequence requirement of the Agreement.

The Contractor acknowledges that its failure to comply with the County's policies to protect water resources and the environment, and all applicable stormwater management, water quality control, erosion and sediment control laws, rules, regulations, permits, procedures and specifications shall constitute a material breach under this contract. For the breach or violation of this provision, without limiting any other rights or remedies to which the County may be entitled, the County shall have the right, in its sole discretion to suspend, discontinue or terminate this Agreement immediately upon notice to the Contractor. In such event, the Contractor shall be liable to the County for any additional costs incurred by the County in the completion of the project.

The failure of the Contractor to comply with these requirements could lead to a determination that the Contractor is not a responsible bidder when the Contractor is bidding on other projects.

15. SANITARY REGULATIONS

The Contractor shall obey and enforce such sanitary regulations and orders and shall take such precautions against infectious diseases as may be deemed necessary. The building of shanties or other structures for housing the men, tools, machinery or supplies will be permitted only at approved places, and the sanitary condition of the grounds in and at such shanties or other structures must be at all times maintained in a satisfactory manner.

16. CLEANING UP

Upon completion of the work, the Contractor shall remove all equipment, rubbish, debris and surplus materials from the buildings, and grounds, and provide a suitable dumping place for such materials. The premises shall be left in a neat, clean and acceptable condition.

No litter, debris of any kind shall be allowed to accumulate for more than one day in any portion of the buildings or grounds, and must be removed from the area at the end of each workday.

17. PREVENTION OF DUST HAZARD

In accordance with the New York State Labor Law, Section 22a, in the event a silica or other harmful dust hazard is created due to construction operations under the contract, the Contractor shall install, maintain and keep in effective operation the appliances and methods

for the elimination of such silica dust or other harmful dust as have been recommended and approved by State and local authorities.

18. REPRESENTATIVE ALWAYS PRESENT

The Contractor in case of its absence from the work shall have a competent representative fluent in English or foreman present, who shall obey without delay, all instructions of the Construction Administrator in the prosecution and completion of the work in conformity with this contract, and shall have full authority to supply labor and material immediately.

19. WORK IN BAD WEATHER

During freezing, stormy or inclement weather, no work shall be done except such as can be done satisfactorily and in a manner to secure first-class construction throughout.

20. PROTECTION OF WORK UNTIL COMPLETION

The Contractor shall be responsible for the protection and maintenance of its work until the same has been accepted by the Owner and shall make good any damage to the work caused by floods, storms, settlements, accidents, or acts of negligence by its employees or others so that the complete work when turned over to the Owner will be in first-class condition and in accordance with the plans and specifications.

21. REMOVAL OF TEMPORARY STRUCTURES AND CLEANING UP

On or before the completion of the work the Contractor shall, without charge therefore, tear down and remove all buildings and other structures built by him for facilitating the carrying out of the work, shall remove all rubbish of all kinds from the grounds which he has occupied, shall do any small amount of additional trimming and grading and shall leave the entire work and premises clean, neat and in good condition. The Contractor shall provide at its own expense suitable dumping places for such material. When the necessity for protecting traffic ends, the Contractor shall remove all signs, lighting devices, barricades and temporary railings from the site of the work.

22. GROSS LOADS HAULED ON HIGHWAY

The Contractor shall at no time during the construction of this contract, haul gross loads exceeding the legal limit prescribed by the Highway Law over the highways of access to, or the highway included in this contract.

23. CONCRETE BATCH PROPORTIONS - YIELD

No Construction Administrator or Engineer is authorized to instruct or inform the Contractor, or any of its agents or employees, or its concrete supplier as to the weights of the ingredients to be used to produce a cubic yard of concrete or as to the yield to be used to produce a cubic yard of concrete or as to the yield to be expected from any batch. The Contractor shall make its own determination and give its own instructions to its agents, employees and concrete supplier as to the total quantity of ingredients to be purchased as a

cubic yard of concrete. The right is reserved to the Construction Administrator and Engineer, however, to verify yields after batch weights have been established by the Contractor and to order a reduction in total weight per load in the event his/her calculations show that the rated capacity of truck mixers, if approved for use, will be exceeded.

24. DAMAGE DUE TO CONTRACTOR'S OPERATIONS

In the event that damage is caused to structures, surfacing, pavement, shrubbery, trees or to grassed areas through trucking operations, delivery of materials, the actual performance of the work, or other causes, the Contractor shall fully restore the same to their original condition at its own expense. In the event that more than one contractor causes damages to any one area, the Director of Project Management will apportion the amount of repair work to be done by each contractor. The decision of the Director of Project Management shall be final and binding upon the Contractor(s) and may not be challenged except pursuant to a proceeding brought pursuant to Article 78 of the Civil Practice Law and Rules.

25. PROPERTY DAMAGE

The Contractor shall not enter upon nor make use of any private property along the line of work except when written permission is secured from the owner of that property. In case of any damage or injury done along the line of work in consequence of any act or omission on the part of the Contractor, or any one in its employ, in carrying out the contract, the Contractor shall at its own expense restore the same or make repairs as are necessary in consequence thereof in a manner satisfactory to the owner of the affected property; provided, however, that the obligation thus assumed by the Contractor shall not inure directly or indirectly to the benefit of any insurer of physical damage to property or loss of use, rents or profits of property regardless of whether the insurer has actually paid the claim or made only a loan to its insured, nor to the latter if it shall waive or abandon any claim against its insurer or insurers.

In case of failure on the part of the Contractor to restore or repair such property in a manner satisfactory to the owner of the affected property, the party of the first part may upon forty-eight hours notice to the Contractor proceed with such restoration or repair. The expense of such restoration or repair shall be deducted from any monies, which are due or may become due the Contractor under its contract. The Construction Administrator shall be the sole judge as to what constitutes failure to restore or repair as above stated and service of notice by mail addressed to the Contractor at the address stated in the proposal shall be sufficient.

26. CLAIMS FOR DAMAGES

The Contractor agrees that it will make no claim against the County or any of its representatives for damages for delay, interference or disruption of any kind in the performance of its Contract and further agrees that any such claim arising from acts or failure to act of the County or any of its representatives shall be fully and exclusively compensated for by an extension of time to complete the performance of the work as provided herein.

27. EXTENSIONS OF TIME

An extension or extensions of time may be granted only by the Commissioner and only upon a verified application therefore by the Contractor. Each application for an extension of time must set forth in detail the nature of each cause of delay in the completion of the work, the date upon which each such cause of delay began and ended, and the number of days attributable to each of such causes. If the schedule for this project is based upon the Critical Path Method, the Contractor must also demonstrate that the delay for which an extension of time is sought occurred on the critical path. A formal written notice of the Contractor's intent to apply for an extension of time must be submitted to the Commissioner within seven (7) calendar days of the start of the alleged delay. The formal application for the extension of time must be submitted to the Commissioner no later than ten (10) calendar days after the end of the delay, but in no event later than the Contractor's submittal of its application for its substantial completion payment. The failure of the Contractor to timely submit either its formal written notice of its intent to apply for an extension of time or the application thereof shall be deemed a waiver of any entitlement to any extension of time.

The Contractor shall be entitled to an extension of time for delay in completion of the work caused solely (1) by the acts or omissions of the County, its officers, agents or employees; or (2) by the acts or omissions of other Contractors on this project; or (3) by supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, Acts of God, excessive inclement weather, war, or any other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes not brought about by any act or omission of the Contractor).

The Contractor shall not be entitled to receive a separate extension of time for each of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the work as determined by the Engineer or Commissioner. If one of multiple causes of delay operating concurrently results from any act or omission of the Contractor or of its subcontractors of whatever tier, and would of itself (irrespective of concurrent causes) have delayed the work, no extension of time will be allowed for the period of delay resulting from such act or omission and the Contractor shall re-arrange his Progress Schedule and operations so as to complete the Work within the time set forth in the Contract and minimize the impact of the Work on the other Prime Contractors.

The determination made by the Commissioner or Engineer on an application for an extension of time shall be binding and conclusive on the Contractor and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules.

Permitting the Contractor to continue with the work after the time fixed for its completion has expired, or after the time to which such completion may have been extended has expired, or the making of any payment to the Contractor after such time, shall not operate as waiver on the part of the County of any of its rights or remedies under this contract nor shall it relieve the Contractor from his obligation under the Contract, including without limitations its liability to the County for liquidated damages, engineering costs, delays, damages, and/or costs incurred by the County.

If the Commissioner deems it advisable and expedient to have the Contractor complete and furnish the Work after the expiration of the time of Completion of Work (see "Required

Time For Completion Of The Work" of the General Requirements) and in order that the County's fiscal officers may be permitted to make payment to the Contractor for Work performed beyond that date, the Commissioner may extend the Contract solely for the purpose of enabling the Contractor to be paid for Work performed. This extension shall in no way relieve the Contractor from his obligation under the Contract, including without limitations its liability to the County for liquidated damages, engineering costs, delays, damages, attorney's fees and/or costs incurred by the County, nor shall such extension of time be asserted by the Contractor in any action or proceeding as evidence that it completed its work in a timely manner.

The time necessary for review by the Engineer of all submittals including vendors, shop drawings, substitutions, etc., and delays incurred by normal seasonal and weather conditions should be anticipated and is neither compensatory nor eligible for Extensions of Time.

When the Work embraced in the Contract is not completed on or before the date specified herein, engineering and inspection expenses incurred by the County of Westchester upon the Work from the completion date originally fixed in the Contract to the final date of completion of the Work may be charged to the Contract and be deducted from the final monies due the Contractor.

28. REQUEST FOR APPROVAL OF EQUAL

A. GENERAL REQUIREMENTS

Wherever in the Contract Documents an article, material, apparatus, product or process is called for by trade name or catalog reference, or by the name of the patentee, manufacturer or dealer, it is understood that it constitutes the standard requirement to meet the contract specifications. Where two or more articles, materials, apparatus, products or processes are listed as acceptable by reference to trade name or otherwise, the choice of these will be optional to the bidder.

Bidders may base their bid on one of the specified items, or they may base their bid on an "equal". However, the bidder should be aware that the County makes the final determination as to what constitutes an equal.

If the Engineer shall reject the proposed equal as not being the equal of that specifically named in the contract, the successful bidder (Contractor) shall immediately proceed to furnish the designated article, material, apparatus, product or process as specified or an approved equal without additional cost or time delay to the County.

B. REVIEW PROCESS

1) Within fifteen (15) days from the Notice to Proceed, requests for approval of equals must be proposed to the Commissioner on the "Request For Approval Of Equal" form of the Sample Forms. This Period for submitting requests will be strictly enforced. Such requests shall conform to the requirements of this Article.

2) Requests for approval of equals will be received and considered from Prime Contractors only and not from manufacturers, suppliers, Subcontractors, or other third parties.

3) If the materials and equipment submitted are offered as equals to the Contract

Documents the Contractor shall advise the County and the Engineer of the requested equal and comply with the requirements hereinafter specified in this Article.

4) Where the acceptability of an equal is conditioned upon a record of satisfactory operation and the proposed equal does not fulfill this requirement, the Engineer, at his/her sole discretion, may accept the equal if the Contractor provides a bond or cash deposit which guarantees replacement at no cost to the County for any failure occurring within the specified time. The equal item must meet all other technical requirements contained in the Specification.

5) The successful bidder shall furnish such information as required by the Engineer to demonstrate that the equal article, material, apparatus, product or process is the equal of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended. The Contractor shall set forth the reasons for desiring to utilize the proposed equal.

6) Contractor shall submit:

   a. For each proposed request for approved equal sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Engineer to determine if the proposed request for approved equal is equal, including manufacturer's brand or trade names, model numbers, description of specification of item, performance data, test reports, samples, history of service, and other data as applicable.

   b. Certified tests, where applicable, by an independent laboratory attesting that the proposed equal is equal.

   c. A list of installations where the proposed equal equipment or materials is performing under similar conditions as specified.

7) Requests for approval of equal after the period set forth in B. REVIEW PROCESS, Paragraph 1, above will not be accepted for evaluation except in case of strikes, discontinuance of manufacturer or other reason deemed valid by the Engineer whereby the specified products or those approved are unattainable. In such case the Contractor shall provide substantial proof that the acceptable products are unavailable.

8) Where the approval of an equal requires revision or redesign of any part of Work, including that of other Contracts, all such revision and redesign, and all new drawings and details required therefore, shall be provided by the Contractor at its own cost and expense, and shall be subject to the approval of the Commissioner.

9) In the event that the Engineer is required to provide additional engineering services, then the engineer's charges for such additional services shall be promptly paid by the Contractor to the County.

10) Any modifications in the Work required under other Contracts to accommodate the changed design will be incorporated in the appropriate Contracts and any resulting increases in Contract prices will be paid by the Contractor who initiated the

changed design to the County.

11) In all cases the Engineer shall be the judge as to whether a proposed equal is to be approved. The Contractor shall abide by his/her decision when proposed equal items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No equal items shall be used in the Work without written approval of the Engineer.

12) In making request for approval of equal, Contractor represents that:

    a. Contractor has investigated proposed equal, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified.

    b. Contractor will provide the same or better warranties or bonds for proposed equal as for product, manufacturer or method specified.

    c. Contractor waives all claims for additional costs or extension of time related to proposed equal that subsequently may become apparent.

    d. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering an equal proposed by the Contractor or by reason of refusal of the Engineer to approve an equal proposed by the Contractor. Any delays arising out of consideration, approval, or utilization of an equal shall be the sole responsibility of the Contractor requesting the equal and it shall arrange its operations to make up the time lost.

13) Proposed Equal Will Not Be Accepted If:

    a. Acceptance will require substantial revision of Contract Documents.

    b. They will change design concepts or Technical Specifications.

    c. They will delay completion of the Work, or the Work of other Contractors.

    d. They are indicated or implied on a Shop Drawing and are not accompanied by a formal request for approval of equal from Contractor.

14) Only those products originally specified and/or added by approved requests for equals submitted in accordance with the preceding paragraphs may be used in the Work. Whenever requests for equals are approved, it shall be understood that such approval is conditional upon strict conformance with all requirements of the Contract and further subject to the following:

    a. Any material or article submitted for approval in accordance with the above procedure must be equal, in the sole opinion of the Engineer, to the material or article specified. It must be readily available in sufficient quantity to prevent delay of any Work; it must be available in an equivalent color, texture, dimension, gauge, type and finish as to the item or article specified; it must be equal to the specified item in strength, durability, efficiency, serviceability, compatibility with existing systems, ease and cost of maintenance; it must be compatible with the design and not necessitate substantial design modifications; it must be equal in warranties and guarantees; its use must not impose substantial additional Work, or require substantial changes in the Work of any

other Contractor. Availability of spare parts shall be assured for the useful life of the Project.

b. The Engineer reserves the right to disapprove, for aesthetic reasons, any material or equipment on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.

c. All requests for approval of equals of materials or other changes from the contract requirements shall be accompanied by an itemized list of all other items affected. The Engineer shall have the right, if such is not done, to rescind any approvals for equals or changes and to order such Work removed and replaced with Work conforming to the specified requirements of the contract, all at the Contractor's expense, or to assess all additional costs resulting from the equal to the Contractor.

15) Approval of an equal will not relieve Contractor from the requirement to submit Shop Drawings or any of the provisions of the Contract Documents.

16) In the event that the Engineer is required to provide additional engineering services as a result of a request for approval of an equal of materials or equipment which are not "or equal" by the Contractor, or changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, or for evaluation of deviations from Contract Documents, then the Engineer's charges in connection with such additional services shall be paid by the Contractor to the County.

17) The Contractor shall respond to required submittals with complete information and with a degree of accuracy to achieve approvals within three (3) submissions. All costs to the Engineer involved with subsequent submissions requiring approval, will be paid by the Contractor to the County.

29. SUBSTITUTION

A. Should the Contractor desire to substitute other articles, materials, apparatus, products or processes than those specified or approved as equal, the Contractor shall apply to the Engineer in writing for approval of such substitution. It should be noted that the bid shall not be based on a substituted article, material, apparatus, product or process. With the application shall be furnished such information as required by the Engineer to demonstrate that the article, material, apparatus, product or process he wishes to use is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended. The Contractor shall set forth the reasons for desiring to make the substitution and shall further state what difference, if any, will be made in the construction schedule and the contract price for such substitution should it be accepted; it being the intent hereunder that any savings shall accrue to the benefit of the County.

B. If the Engineer shall reject any such desired substitution as not being the equivalent of that specifically named in the contract, or if it shall determine that the adjustment in price in favor of the County is insufficient, the Contractor shall immediately proceed to furnish the designated article, material, apparatus, product or process.

C. Request for substitutes must be proposed to the Commissioner on the "Request For Approval Of Substitution" form of the Sample Forms. Such requests shall conform to the requirements of this Article.

D. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the County.

E. Requests for utilization of substitutes will be reviewed during the course of the project. The impact on the project and the timeliness of submission will be of key consideration.

F. The approval of utilization of a substitute is subject to the sole and final discretion of the Engineer.

G. REVIEW PROCESS

1) Requests for approval of substitutions will be received and considered from Prime Contractors only and not from manufacturers, suppliers, Subcontractors, or other third parties.

2) If the materials and equipment submitted are offered as substitutions to the Contract Documents or approved equal the Contractor shall advise the County and the Engineer of the requested substitutions and comply with the requirements hereinafter specified in this Article.

3) Where the acceptability of substitution is conditioned upon a record of satisfactory operation and the proposed substitution does not fulfill this requirement, the Engineer, at his/her sole discretion, may accept the substitution if the Contractor provides a bond or cash deposit which guarantees replacement at no cost to the County for any failure occurring within the specified time. The substitution item must meet all other technical requirements contained in the Specification.

4) The Contractor shall furnish such information as required by the Engineer to demonstrate that the equal article, material, apparatus, product or process is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended and/or that it offers substantial benefits to the County in saving of time and/or cost. The Contractor shall set forth the reasons for desiring to make this substitution.

5) Contractor shall submit:

a. For each proposed request for approved substitute sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Engineer to determine if the proposed request for approval should be granted, including manufacturer's brand or trade names, model numbers, description of specification of item, performance data, test reports, samples, history of service, and other data as applicable.

b. Certified tests, where applicable, by an independent laboratory attesting to the performance of the substitute.

c. A list of installations where the proposed substitute equipment or materials is performing under similar conditions as specified.

6) Where the approval of a substitute requires revision or redesign of any part of Work, including that of other Contracts, all such revision and redesign, and all new drawings and details required therefore, shall be provided by the Contractor at its own cost and expense, and shall be subject to the approval of the Engineer.

7) In the event that the Engineer is required to provide additional engineering services, then the engineer's charges for such additional services shall be paid by the Contractor to the County.

8) Any modifications in the Work required under other contracts to accommodate the changed design will be incorporated in the appropriate contracts and any resulting increases in contract prices will be charged to the Contractor by the County who initiated the changed design.

9) In all cases the Engineer shall be the judge as to whether a proposed substitute is to be approved. The Contractor shall be bound by his/her decision. No substitute items shall be used in the Work without written approval of the Engineer.

10) In making request for approval of substitute, Contractor represents that:

a. Contractor has investigated proposed substitute, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified or offers other specified advantages to the County.

b. Contractor will provide the same or better warranties or bonds for proposed substitute as for product, manufacturer or method specified.

c. Contractor waives all claims for additional costs or extension of time related to proposed substitute that subsequently may become apparent.

d. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitute proposed by the Contractor or by reason of failure of the Engineer to approve a substitute proposed by the Contractor. Any delays arising out of consideration, approval, or utilization of a substitute shall be the sole responsibility of the Contractor requesting the substitute and it shall arrange its operations to make up the time lost.

11) Proposed substitute will not be accepted if:

a. Acceptance will require substantial revision of Contract Documents.

b. They will substantially change design concepts or Technical Specifications.

c. They will delay completion of the Work, or the Work of other Contractors.

d. They are indicated or implied on a Shop Drawing and are not accompanied by a formal request for approval of substitute from Contractor.

12) The Engineer reserves the right to disapprove, for aesthetic reasons, any material or

equipment on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.

13) All requests for approval of substitutes of materials or other changes from the contract requirements, shall be accompanied by an itemized list of all other items affected by such substitution or change. The Engineer shall have the right, if such is not done, to rescind any approvals for substitutions and to order such Work removed and replaced with Work conforming to the specified requirements of the contract, all at the Contractor's expense, or to assess all additional costs resulting from the substitution to the Contractor.

14) Approval of a substitute will not relieve Contractor from the requirement to submit Shop Drawings or any of the provisions of the Contract Documents.

15) In the event that the Engineer is required to provide additional engineering services as a result of a request for approval of a substitute results in changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, or for evaluation of deviations from Contract Documents, then the Engineer's charges in connection with such additional services shall be paid by the Contractor.

16) Structural design shown on the Drawing is based upon the configuration of and maximum loading for major items of equipment as indicated on the Drawings and as specified. If the substituted equipment furnished differs from said features, the Contractor shall pay to the County all costs of redesign and for any construction changes required to accommodate the equipment furnished, including the Engineer's charges in connection therewith.

17) The Contractor shall respond to required submittals with complete information and with a degree of accuracy to achieve approvals within two (2) submissions. All costs to the Engineer involved with subsequent submissions of Shop Drawings, Samples or other items requiring approval, will be paid by the Contractor to the County, by deducting such costs from payments due for Work completed. In the event an approved item is requested by the Contractor to be changed or substituted for, all costs involved in the reviewing and approval process will likewise be backcharged to the Contractor unless determined by the Engineer that the need for such substitution and/or deviation from Contract Documents is beyond the control of the Contractor.

30. EXTRA WORK: INCREASED COMPENSATION/DECREASED WORK: CREDIT TO THE OWNER

The Director of Project Management may, at any time, by a written order, and without notice to the sureties, require the performance of Extra Work or require or approve changes in the work, or Decreased Work ("work" to include but not be limited to specified methods of performing work) as he may deem necessary or desirable. The amount of compensation

to be paid to the Contractor for any Extra Work, as so ordered, or credit to the Owner for such decreased work, as so ordered or approved, shall be determined as follows:

1) **First**: By such applicable unit prices, if any, as set forth in the Contract; or

2) **Second**: If no such prices are so set forth, then by unit prices or by a lump sum, or sums, mutually agreed upon by the Director of Project Management and the Contractor; or

3) **Third**: If, in the opinion of the Director of Project Management, the aforesaid unit prices, under "First" above, are not applicable, or if the two parties hereto cannot reach agreement as to new unit prices or a lump sum, or sums, under "Second" above, then by the actual net cost in money to the Contractor of the materials and of the wages of applied labor (including cost of supplements provided and premiums for Workmen's Compensation Insurance, FICA, and Federal and State Unemployment Insurance) required for such Extra Work, plus twenty (20%) percent as compensation for all items of profit and costs or expenses including administration, overhead, superintendence, insurance (other than those specifically noted above) materials used in temporary structures, allowances made by the Contractor to subcontractors, including those made for overhead and profit, additional premiums upon the performance bond of the Contractor and the use of small tools and any and all other costs and expenses not enumerated above, plus such rental for plant and equipment (other than small tools) required and approved for such extra work. Where extra work is performed by a Subcontractor, the twenty percent stipulated above shall be divided between the Contractor and the Subcontractor as per their contractual agreement, or if not defined therein, then as the Contractor sees fit.

Rental rates for any power operated machinery, trucks or equipment, which it may be found necessary to use as in "Third" above, shall be reasonable and shall be based on those prevailing in the area of the County where such work is to be done, and they shall be agreed upon in writing before the work is begun.

In no case shall the rental rates submitted exceed the rates set up in the current edition of "Equipment Watch" plus the cost of fuel and lubricants.

These rates shall include all repairs, fuel, lubricants, applicable taxes, insurance, depreciation, storage and all attachments complete, ready to operate, but excluding operators. Operators shall be paid as stated here in above for labor.

For equipment, which is already on the project, the rental period shall start when ordered to work by the Construction Administrator, and shall continue until ordered to discontinue by him. The minimum payment for any one rental period shall be four hours, unless otherwise agreed upon between the Construction Administrator and the Contractor.

For equipment which has to be brought to the project, specifically for use as in "Third" above, the County will pay all loading and unloading costs, also all transportation costs will not be paid, if the equipment is used for work other than in "Third" above while on the project. The rental period shall begin at the time the equipment has been unloaded on the

project, and shall end on and include the day the order to discontinue the use of the equipment as in "Third" above is given to the Contractor by the Construction Administrator.

The daily rate shall apply for rental periods of four calendar days or less, the weekly rate shall apply for rental periods of more than four and not exceeding twenty-one calendar days, and the monthly rate shall apply for rental periods in excess of twenty-one calendar days. For fractional periods above the full unit rental period (day, week, month) reimbursement shall be proportioned on the basis of the applicable rental period. (Day-8 hrs.; Week-7 calendar days; Month-30 calendar days).

No percentage shall be added to the amounts of equipment rental prices agreed upon, but the price agreed upon shall be the total compensation allowed for the use of such equipment.

The provisions hereof shall not affect the power of the Contractor to act in case of emergency.

31. DISPUTED WORK - NOTICE OF CLAIMS FOR DAMAGES

If the Contractor is of the opinion that any work required, necessitated, or ordered violates or conflicts with or is not required by the terms and provisions of this Contract, it must promptly, within five (5) calendar days after being directed to perform such work, notify the Construction Administrator, in writing, of its contentions with respect thereto and request a final determination thereon. If the Construction Administrator determines that the work in question is contract and not extra work, or that the order complained of is proper, he will direct the Contractor in writing to proceed and the Contractor shall promptly comply. In order, however, to preserve its right to claim compensation for such work or damages resulting from such compliance, the Contractor must, within seven (7) calendar days after receiving notice of the Construction Administrator's determination and direction, notify the Construction Administrator, in writing that the work is being performed or that the determination and direction is being complied with, under protest. Failure of the Contractor to so notify shall be deemed as a waiver of claim for extra compensation or damages therefore.

While the Contractor is performing disputed work or complying with a determination or order under protest in accordance with this Article, in each such case the Contractor shall furnish the Construction Administrator daily with three copies of written statements signed by the Contractor’s representatives at the site showing:

1) the name of each worker employed on such work or engaged in complying with such determination or order, the number of hours employed thereon, and the character of the work each is doing; and

2) the nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such work or compliance with such order, and from whom purchased or rented.

It is expressly agreed that no dispute over the scope of the Contractor’s work or any portion thereof shall cause any delay or interruption to the Contractor’s work.

In addition to the foregoing statements, the Contractor shall, upon notice from the Board of Acquisition and Contract, produce for examination by the duly appointed representative of

the Board of Acquisition and Contract, all its books of accounts, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books and canceled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this contract, and submit itself, its agents, servants and employees for examination under oath by any duly appointed representative designated by the Board of Acquisition and Contract to investigate claims made against the County. Unless the aforesaid statements shall be made and filed within the time aforesaid and the aforesaid records submitted for examination and the Contractor, its agents, servants, and employees submit themselves for examination as aforesaid, the County shall be released from all claims arising under, relating to or by reason of this contract, except for the sums certified by the Construction Administrator to be due and agreed that no person has power to waive any of the foregoing provisions, and that in any action against the County to recover any sum in excess of the sums certified by the Construction Administrator to be due under or by reason of this contract, the Contractor must allege in its complaint and prove, at the trial, strict compliance with the provisions of this article.

Before final acceptance of the work by the County, all matters of dispute must be adjusted to the mutual satisfaction of the parties thereto. Determinations and decisions in case any question shall arise, shall constitute a condition precedent to the right of the Contractor to receive the money therefore, until the matter in question has been adjusted.

32. CONTRACTOR'S SUBCONTRACTS AND MATERIAL LISTS

Within fifteen (15) days after execution of the Contract, the successful bidder shall submit to the County for approval a list of the subcontractors, materialmen and materials that he/she plans to use in the performance of the work and statements of the work they are to perform. The format and content of the list shall be in accordance with directives from the Construction Administrator. He/sit shall also submit additional information regarding their qualifications as may be later requested by the County. No part of the work may be sublet until after the Contractor has received the County's approval.

The Contractor shall be fully responsible for all acts and omissions of its subcontractors and persons directly or indirectly employed by them, and the County's approval to sublet parts of the work will in no way relieve the Contractor of any of its obligations under the Contract. All dealings of the Construction Administrator with the subcontractors shall be through the Contractor, subcontractors being recognized by the County only as employees of the Contractor.

By executing the Agreement, the Contractor represents that the Contractor shall insert appropriate clauses in all subcontracts to bind the subcontractors to the Contractor by all applicable provisions of the Contract Documents executed between the Contract and the County, but this shall not be construed as creating any contractual relationships between subcontractors and the County. Prior to approval of the subcontractors, the County has the right to review and recommend changes in the subcontracts. The County reserves the right to reject any subcontractor proposed by the Contractor if in the reasonable opinion of the County such subcontractor lacks the experience, capability or integrity to perform its subcontract work or is otherwise non-responsible.

By executing the Agreement, the Contractor represents that the Contractor shall insert appropriate clauses in each subcontract that require that if the Contractor is terminated by the County either for default or convenience that at the sole option of the County the subcontract shall automatically attorn to the County and the subcontractor shall continue without delay or interruption to fully perform all of the obligations required by its subcontract.

Where the specifications permit the Contractor a choice of different materials or manufactured products, it shall state the choice he has made in making up its bid, with the understanding that all choices must subsequently be approved by the Commissioner, after award of the contract to the successful bidder. If the bidder wishes to propose utilization of materials or manufactured products other than those specified, it shall so state and submit the required information in accordance with Article "Request For Approval Of Equal" of the General Clauses."

33. ASSIGNMENT OF CONTRACT

The Contractor shall not assign, transfer, convey or otherwise dispose of the contract or any part of it or any monies due and payable under the contract, without prior written approval of the County. If such approvals are granted by the County, they shall in no way relieve the Contractor or from any obligations under the terms of this Contract.

All documents assigning the contract or any part of it or any monies due and payable under the contract shall contain a clause stating that all monies to be paid the assignee in accordance with the terms of the Contractor's contract with the County, are subject to a prior lien for services rendered or materials and equipment supplied, in favor of all persons, firms or corporations rendering such services or supplying such materials and equipment.

34. PAYMENT FOR GENERAL PROVISIONS

No direct payment will be made for work done or materials furnished in compliance with the General Provisions of the specifications, unless otherwise noted. All compensation to the Contractor for its performance of the requirements of any general provision shall be considered to have been included in the prices he has bid for the individual items if a unit price contract and/or for a lump sum price if a lump sum contract.

In the event the Contractor fails or refuses to proceed with its work and/or correct or repair deficient or defective work then without prejudice to any and all of the County's other rights and remedies, and upon three (3) days notice to Contractor, the County may perform and/or employ any other person or persons to correct and/or repair any or all such work. All costs incurred by the County pertaining thereto shall be paid forthwith by the Contractor to the County.

35. COSTS INCURRED BY COUNTY

Wherever in these Contract Documents the County is entitled to recover costs from the Contractor or charge the Contractor for the costs incurred for the correction, supervision or for any other reason related to the Contractor's work or arising from the Contractor's failure or refusal to proceed with its work in a timely manner, such costs and/or charges shall be

deemed to include, but not be limited to, the County's costs and fees for inspection(s), engineering, consultant(s) and attorneys.

36. GUARANTEE OF WORK

A. Except as otherwise specified, all work performed under the Contract shall be guaranteed by the Contractor against defects resulting from the use of inferior materials, equipment or workmanship for one year from the guarantee starting date (which shall be defined as the date of the County's approval of the final Certificate for Payment or the date of actual full occupancy of the building, whichever is earlier). The building, section thereof, or item of equipment, shall be occupied or put into actual use by the Owner only after judged completed by the Construction Administrator and Owner and approved by him as ready for occupancy.

B. If, within any guarantee period, repairs or changes are required in connection with guaranteed work, which in the opinion of the Construction Administrator or Owner is rendered necessary as a result of the materials, equipment or workmanship which are inferior, defective, or not in accordance with terms of the Contract, the Contractor shall promptly upon receipt of notice from the Construction Administrator or Owner and without expense to the Construction Administrator or Owner:

   1) Place in satisfactory condition, in every particular, all of such guaranteed work, correct all defects thereof, and

   2) Make good all damages to the building or site, or equipment or contents thereof, and

   3) Make good any work or material, or equipment and contents of said building or site disturbed in fulfilling any such guarantee.

C. In any case where in fulfilling requirements of the Contract or of any guarantee embraced in or required thereby the Contractor disturbs any work, it shall restore such disturbed work to a condition satisfactory to the Construction Administrator.

D. If the Contractor, after notice, fails to proceed promptly to comply with terms of its guarantee, the Owner may have the defects corrected and the Contractor shall be liable for all expenses incurred.

E. All special guarantees applicable to definite parts of the work that may be stipulated in the Specifications or other papers forming a part of the Contract shall be subject to the requirements and term of this article.

37. SEPARATE CONTRACTS

A. Contractor's attention is specifically directed to the fact that, because of the work of other contracts within and adjacent to the limits of this Contract they may not have exclusive occupancy of the territory within or adjacent to the limits of this Contract.

B. Contractor's attention is further directed to the fact that, during the life of this Contract the owners and operators of Public Utilities may make changes in their facilities. These changes may be made by the Utility employees or by contract within the limit or adjacent to these contracts and may be both temporary and permanent.

C. Contractor shall be required to cooperate with other contractors and the owners of the various utilities, and to coordinate and arrange the sequence of their work to conform to the progressive operations of the work already under contract and to be put under contract.

D. Contractor shall be responsible for the coordination of the work of their various subcontractors. Their respective operations shall be arranged and conducted so that delays will be avoided. Where the work of a subcontractor overlaps or dovetails with that of other subontractors, materials shall be delivered and operations conducted so as to carry on the work continuously in an efficient and workmanlike manner. Delays or oversights on the part of Contractor or its subcontractors or utility owners in getting any or all of their work done in the proper way thereby causing cutting, removing and replacing work already in place, shall not be the basis for claim for extra compensation.

E. In case of interference between the operations of the utility owners and different Contractors, the Construction Administrator will be the sole judge of the rights of each Contractor and the sequence of work necessary to expedite the completion of the entire project, and in all cases the Construction Administrators decision shall be accepted as final and may not be challenged except in a proceeding brought pursuant to Article 78 of the Civil Practice Law and Rules.

38. COOPERATION WITH OWNER

Each Contractor shall cooperate with the Owner as to parking of vehicles, availability of storage and working areas and confining of activities and personnel to same. **NO PARKING FOR CONTRACTOR'S EMPLOYEES**.

39. JOB MEETINGS & PROJECT SUPERINTENDANT

A. An officer of the Contractor, or its project manager or superintendent, who is fluent in English and authorized to make binding decision on behalf of the Contractor shall attend job meetings with the Commissioner and/or the Construction Administrator, and any subcontractors whom the Inspector may designate; for the purpose of discussing expedition, execution and coordination of the work.

B. Job meetings will be scheduled periodically (the first to be prior to commencement of construction) at a time and place designated by the Construction Administrator.

C. The Contractor shall not commence any work prior to the first (pre-construction) meeting between the Contractor, Commissioner and/or Construction Administrator, client, and other concerned governmental and utility company representatives.

D. At the pre-construction meeting, the scheduling of the work on an arrow-flow diagram (showing chronologically and in detail the sequence and methods that will be followed) will be provided, and details for the proper execution and special requirements of the work will be explained and discussed.

E. The Contractor shall be responsible for providing a detailed construction schedule that provides for a Critical Path Method (“CPM”) and which is compatible with any of the state of the art CPM Method scheduling software.

F. Updated coordinated arrow-flow diagrams or CPM schedules, as the case may be, will be provided by the Contractor, as above, on a monthly basis to the County.

The Contractor shall indicate on the construction schedules noted above, time for shop drawing preparation, approvals, fabrication and delivery of materials and equipment for major items. The County may request that additional important items be included on the schedule.

G. The Contractors hall ensure that its Project Superintendent shall be on site full time at all times when the Contractor's Work is being performed.

40. PATENT WARRANTY

A. Contractor expressly represents, warrants and agrees that he has the legal right to furnish and install and to authorize the County to purchase and use the equipment hereby offered and each and every one of its several parts and every feature thereof, under one or the other, or partly under one and partly under the other of the following representations.

1) That the Contractor possesses a valid patent(s) covering the equipment to be furnished hereunder or part or features thereof or has or will obtain permit(s) and license(s) authorizing the Contractor to furnish and install same and to authorize the purchase and use thereof by the County.

2) The Contractor is responsible before ordering material, equipment, parts, systems, etc, to verify that the suppliers of all such material, equipment, parts, systems, etc, will supply the required warranty, guarantee, O & P manual, and maintenance service schedule.

3) That the equipment offered or certain parts or features thereof are not covered by any valid patent(s) within the knowledge of the Contractor.

B. Contractor further warrants and agrees that if any patent(s) is hereafter issued to any person whatsoever with respect to the equipment or any part or features thereof, to be furnished and installed hereunder, the Contractor will obtain such permit(s) or license(s) from the Patentee as may be necessary to authorize the use of the equipment by the County.

C. Contractor further represents, warrants and agrees that he and its sureties shall hold themselves responsible for and defend any claims made against the County for any infringement of patents due to the purchase and use by the County of said equipment or any part or feature thereof; that they will indemnify and save harmless the County from all costs, expenses and damages which it shall be obliged to pay by reason of any such infringement of patent(s); that in case the use of any such equipment is enjoined, they will bear the expenses of removing same and replacing same with equipment which will satisfactorily perform the function without constituting an infringement of any patent(s); and in case the use of any equipment shall be enjoined, that they shall pay to the County the sum of $1,000.00 per day, as liquidated damages, for each and every day during which the County shall be enjoined from using the same up to the day on which such

equipment is replaced by other equipment which will satisfactorily perform the same function but which will not constitute an infringement of any other patent(s).

D. The Contractor further agrees in the event the use of any of the equipment is enjoined and the Contractor is unable within a reasonable time to devise other equipment which will satisfactorily perform the same functions without infringement on any patent(s), that he will remove the equipment and refund to the County the entire cost of its purchase and installation, plus the sum of $ 1,000.00 per day as liquidated damages for each and every day until the substitute equipment has been purchased and installed by the County, excepting however that such period shall not exceed three months.

E. The Contractor further agrees in the event that any claim or notice of claim for infringement of patent(s) are made or filed prior to the making of payment by the County for the equipment and/or material proposed to be furnished and installed hereunder, that the County may withhold any sum due to the Contractor for such equipment and/or material until such claims shall have been settled or adjudicated or until additional surety bonds or other guarantees of indemnification shall have been posted, if deemed necessary by the County for its protection.

41. MATERIALS

A. Quality

1) It is the intent of these Specifications to describe definitely and fully the character of materials and workmanship required with regard to all ordinary conditions of the work and to require first-class work and new and best quality materials in all particulars. For unexpected conditions arising during the progress of the work and not fully covered herein, the Specifications shall be interpreted by the Construction Administrator to require first-class work and materials and such interpretations shall be accepted by the Contractor.

2) The Contractor is responsible before ordering material, equipment, parts, systems, etc, to verify that the suppliers of all such material, equipment, parts, systems, etc, will supply the required warranty, guarantee, O & P manual, and maintenance service schedule.

3) Where materials or devices are specified in these documents by reference to government, manufacturer's association, or professional society standards, the pertinent sections of the latest edition of such standards shall have the same force and effect as if set forth in full in these Specifications. The following abbreviations shall be used as indicated for the principal societies:

AASHO	American Association of State Highway Officials
ACI	American Concrete Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute

ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWI	American Woodworking Institute
AWS	American Welding Society
BHMA	Builders Hardware Manufacturers Association
CS	Commercial Standards
FS	Federal Specifications
IEEE	Institute of Electrical and Electronic Engineers
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
SDI	Steel Deck Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Incorporated
TCA	Tile Council of America, Incorporated
TMCA	Tile and Marble Contractors of America
UL	Underwriter's Laboratories, Incorporated

B. Delivery, Storage and Handling:

1) Materials shall be delivered in manufacturer's original sealed containers with complete identification of contents and manufacturer, and kept sealed in original containers until used. Labels shall not be removed until materials have been installed and inspected.

2) Materials shall be delivered, stored, and handled with proper equipment and in a manner to protect them from damage.

3) The Contractor shall make arrangements for the receipt of materials delivered to the construction site. No representative of the County will accept any materials ordered by the Contractor.

4) Finish materials shall be protected from dirt and damage, and perishable materials shall be stored within appropriate weatherproof enclosures.

5) Delivery of materials shall be coordinated with the Operations Schedule.

6) The Contractor shall confine the apparatus, the storage of materials and the operations of the workmen to the limits indicated by law, ordinances, permits, or directions of the Construction Administrator, and shall not encumber the premises beyond the contract limits.

7) The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

8) Whenever the Contract Documents require delivery by the Contractor of any materials, equipment, or other items, the term delivery shall be deemed to include unloading and storing with proper protection where directed.

C. Federal Regulations

1) Should the Federal Government, because of Declaration of an Emergency, or other cause, establish controls over the use of certain construction materials, then the Contractor, immediately after signing the Contract or immediately after Declaration of an Emergency, shall furnish the Commissioner with an itemized list of all critical materials required for use on the project. For each item, the quantity required and the approximate date on which delivery will be required shall be indicated.

D. Name Plates

1) Each piece of operable equipment to be furnished and installed by a Contractor under its Contract such as motors, pumps, heaters, fans, transformers, switch and fuse racks and other similar equipment shall be provided with a substantial name plate of non-corrodible metal securely fastened in place and clearly and permanently inscribed with the manufacturer's name, the model or type designation, the serial number, the principal rated capacities, the electrical or other power characteristics and other similar and appropriate information.

2) Manufacturer's identification shall be inconspicuous, but where nameplates contain information relative to characteristics or maintenance, they shall be clearly visible and located for easy access.

3) The nameplate of a subcontractor or a distributor will not be permitted.

E. Manufacturer's Certification

1) Prior to the delivery of any water or sewer pipe to the construction site, the Contractor shall furnish properly attested documents certifying as to the type, class, name of manufacturer and source of supply of the pipe. One copy of each document shall be forwarded to the Construction Administrator at the construction site and to the Director of Project Management care of the Engineering Division, Michaelian Office Building, White Plains, New York.

F. Samples

1) The Contractor shall furnish, for approval of the Engineer, any samples required by the specifications or that may be requested by the Owner, of all materials he proposes to use, and shall pay all shipping charges for the samples. The Contractor shall send all samples to the office of the Engineer, except when directed otherwise. The sample of approved material will remain on file in the Engineer's office. A disapproved sample will be returned to the Contractor.

2) No samples are to be submitted with bids.

3) No materials or equipment of which samples are required to be submitted for

approval shall be used on the work until such approval has been given by the Engineer or Construction Administrator, save only at the Contractor's risk and expense.

4) Each sample shall have a label indicating the material represented, its place of origin and the names of the producer, the Contractor and the Contract for which the material is intended.

5) Approval of any sample shall be only for characteristics or for uses named in such approval, and no other. No approval of a sample shall be taken in itself to change or modify any Contract requirement. When a material has been approved, no additional sample of that material will be considered and no change in brand or make will be permitted. Approved samples held by the Engineer will be returned to the Contractor upon completion of the work, if requested.

6) Transactions with manufacturers or subcontractors shall be through the Contractor.

G. Dissimilar Materials

1) Where metals are placed in contact with or fastened to dissimilar metals, concrete, masonry, wood or other absorptive materials subject to repeated wetting or wood treated with a preservative non-compatible with the metal or if drainage from dissimilar materials passes over the work; treat the contact surfaces with a heavy coat of approved alkali-resident bituminous paint.

2) Where one of the metals is aluminum, a coat of zinc-chromate primer shall be applied prior to the bituminous paint.

42. STANDARD OF QUALITY

Wherever in the contract documents an article, material, apparatus, device, product or process is called for by trade name or catalog reference, or by the name of the patentee, manufacturer or dealer, it shall be construed as establishing a standard of quality and not construed as limiting competition. In such instances, the Contractor may use any article, material, etc. which, in the judgment of the Engineer, expressed in writing, is equal to and acceptable for the intent specified.

43. PROPRIETARY ITEM

Whenever less than three names are used in proprietary item specifications, it has been determined that:

A. The use of trade names is necessary for effective and workable specifications for the item.

B. All manufacturers known by the individuals familiar with the trade involved have been listed.

C. Equal items may be approved in accordance with Article “Request For Approval Of Equal” of the General Clauses.

44. SHOP DRAWINGS

A. Shop Drawing Schedule

1) Within fifteen (15) days after the Notice to Proceed, the Contractor shall prepare and submit two (2) copies of its schedule of Shop Drawing submissions to the Engineer for review and approval. The schedule is to be submitted on the "Shop Drawing Schedule" form of the Sample Forms.

2) In order to maintain the construction schedule for this project the Contractor shall submit all Shop Drawings per approved schedule. The Contractor is expressly cautioned that its failure or refusal to timely submit a shop drawing schedule acceptable to the Engineer and/or any deviation from the approved shop drawing schedule shall be deemed a default under this Contract.

3) Shop Drawings shall be submitted without fail in time to permit correction, resubmission and final approval, as hereinafter specified, without causing any delay in the construction of any Work.

4) Samples and Shop Drawings, which are related to the same unit of Work or Specification Section, shall be submitted at the same time. If related Shop Drawings and Samples are submitted at different times, they cannot be reviewed until both are furnished to the Engineer.

5) The schedule shall be updated every four-(4) weeks or more frequently as required by the Engineer.

6) Two (2)-updated copies of the schedule shall be submitted to the Engineer with each application for Partial Payment.

7) Form of Schedule

Schedule shall be in tabular form with appropriate spaces to insert the following information for principal items of equipment and materials:

a. Date on which Shop Drawings are requested and received from the manufacturer.

b. Dates on which Shop Drawings are transmitted to the Engineer by the Contractor.

c. Dates on which Shop Drawings are returned by the Engineer for revisions.

d. Dates on which Shop Drawings are revised by manufacturer and resubmitted to the Engineer.

e. Date on which Shop Drawings are returned by Engineer annotated either "Approved" or "Approved as Noted".

f. Date on which accepted Shop Drawings are transmitted to manufacturer and Contractor's Invoice Number.

g. Date of manufacturer's scheduled delivery.

h. Date on which delivery is actually made.

i. Sample of schedule follows on next page.

B. Shop Drawing Requirements

1) Shop Drawings for the Work shall include working and setting drawings, schedules, shop details, wiring diagrams, manufacturer's catalog cuts and brochures and all other drawings, schedules and diagrams necessary for the proper correlation of the Work.

Insofar as it is practicable, all drawings shall be uniform in size. They shall be dated, numbered consecutively and shall be identified with the Contract Number and Title, a description of the material or equipment and the area of the work and where it is to be installed. Shop drawings shall accurately and clearly show sizes, work, erection dimensions, arrangement and sectional views, necessary details including information for making connection with the work of other items as may be required, materials and finishes, detailed parts lists, and performance characteristics and capacities as may be required.

2) All detailing for structural components shall be done in accordance with the provisions for design and workmanship in the latest additions of the publications listed below except as may be modified in the Contract Documents:

a. "Manual of Steel Construction" of the America Institute of Steel Construction.

b. "Building Code Requirements for Reinforced Concrete" and "Manual of Standard Practice for Detailing Reinforced Concrete Structures" of American Concrete Institute.

3) Detailing practices for other components shall be done to conform to the best trade practices.

4) Contractor Responsibilities

a. Before submitting Shop Drawings to the Engineer all submittals from its Subcontractors, manufacturers or suppliers shall be sent directly to the Contractor for preliminary review, coordination and checking.

Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of material or equipment. Contractor shall thoroughly check all drawings for accuracy and conformance to the intent of the Contract Documents. Drawings found to be inaccurate or otherwise in error shall be returned to the Subcontractors, manufacturers, or suppliers by the Contractor for correction.

b. All submittals, including Shop Drawings prepared by or under the direction of the various Contractors, shall be thoroughly checked by the Contractor for accuracy and checked by the Contractor for accuracy and conformance to the intent of the Contract Documents before being submitted tot he Engineer and shall bear the Contractor's signature certifying that they have been so checked. Before submitting them to the Engineer, all submittals shall be properly labeled and consecutively numbered. In a clear space above the title block, the Contractor shall provide the "Shop Drawing ID" form of the Sample Forms, and enter the required information:

c. Shop Drawings shall be submitted as a single package including all associated drawings for any operating system and shall include all items of equipment and any mechanical units involved or necessary for the functioning of such system. Where applicable, the submittal shall include elementary wiring diagrams showing circuit functioning and necessary interconnecting wiring diagrams for construction.

d. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal. Otherwise, the review of such submittals shall not constitute approval of the departure. The Contractor shall also call the Engineer's attention to any changes by the use of larger letters of at least 1" in height on the Shop Drawings along with a letter by the Contractor advising the Engineer to the recommended change and the reason therefore. If this is not done, even if the Work is incorporated in the construction, it will not be accepted by the Engineer even if Shop Drawings are "Approved".

e. No materials or equipment shall be ordered, fabricated or shipped or any Work performed until the Engineer returns to the Contractor the submittals herein required, annotated "Approved".

f. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the Engineer's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors, deviations and/or omissions.

g. Two (2) copies of Preliminary Operations and Maintenance Manuals shall be submitted with the final Shop Drawings for each item of equipment.

h. Submittals shall be transmitted in strict compliance with Special Clause 10. A.2 and in sufficient time to allow the Engineer adequate time for review and processing so as not to delay the Project per the approved Shop Drawing Schedule.

i. Contractor shall transmit five (5) prints of each submittal to the Engineer for review. Any submissions, which in the opinion of the Engineer, are not legible will not be reviewed and will be returned to the Contractor annotated "Disapproved".

j. Contract drawings are for engineering and general arrangement purposes only and are not to be used as Shop Drawings.

k. Shop Drawings shall accurately and clearly present the following:

- All working and installation dimensions.
- Arrangement and sectional views.
- Units of equipment in the proposed positions for installation, details of required attachments and connections, and dimensioned locations between units and in relation to the structures.
- Necessary details and information for making connections between the

various trades including, but not limited to, power supplies and interconnecting wiring between units, accessories, appurtenances, etc.

l. Structural and all other layout drawings prepared specifically for the Project shall have a plan scale of not less than 1/4-inch equal to 1 foot and they shall be not larger than the size of the Contract Drawings.

m. Where manufacturer's publications in the form of catalogs, brochures, illustrations, compliance certificates, or other data sheets are submitted in lieu of prepared Shop Drawings, such submissions shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submissions showing only general information are not acceptable.

n. The Contractor shall provide all required copies for the use of the various trades and at the Site, and one (1) copy of approved Shop Drawings shall be provided by the Contractor to each of the other Prime Contractors unless otherwise noted in writing by the Engineer.

o. The Contractor shall respond to required submittals with complete information and accuracy to achieve required approvals within three (3) submissions. All costs to the Owner involved with subsequent submissions of Shop Drawings, Samples or other items requiring approval, will be backcharged to the Contractor, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due for Work completed. In the event an approved item is requested by the Contractor to be changed or substituted, all involved costs in the review process will likewise be paid by the Contractor to the County unless determined by the Director of Project Management or Commissioner that the need for such deviation is beyond the control of the Contractor. Contractor shall be responsible for coordinating its Work and submittals with its Subcontractors.. Should Contractor cause the need for additional submissions or reviews of previous submissions all involved costs will similarly be paid to the County.

5) Procedure for Review

a. Shop Drawings will be checked for design conformance with the Contract Documents and general arrangement only.

b. Submittals will be annotated by the Engineer in one of the following ways:

- "Approved" - no exceptions are taken.
- "Approved as Noted" - minor corrections are noted and shall be made and a resubmittal is required.
- "Disapproved because" - with specific deficiencies noted.
- "Disapproved" - based on the information submitted, the submission is not in conformance with the Contract Documents. The deviations from the Contract Documents are too numerous to list and a completely revised submission of the proposed equipment or a submission of other equipment is required.

c. One copy of the reviewed submittals will be returned to the Contractor. It is the Contractor's responsibility to provide copies to:

- Its Subcontractors.
- Its Materialmen and Suppliers.

unless notified otherwise in writing by the Engineer.

6) Disapproved drawings will be returned to the Contractor for correction and resubmission. After the Contractor has had the required corrections made on the original drawing, it shall again submit five copies for review by the Engineer.

7) The acceptance of Shop Drawings by the Engineer shall be only general in nature and shall not relieve the Contractor of any responsibility for the accuracy of the drawings, the proper fitting and construction of the Work or for the furnishing of materials or other Work required by the Contract Documents, but not shown on the Shop Drawings. Acceptance of Shop Drawings by the Engineer shall not be construed as approving departures from the Contract requirements unless specifically noted by the Engineer. Acceptance of Shop Drawings for one item shall not be construed as approval for other changes even if noted by the Contractor on the drawing.

8) Shop Drawings submitted other than in accordance with the outlined procedures will be returned to the Contractor for resubmission and the Contractor shall bear all expense and risk of all delays as if no Shop Drawings had been submitted.

9) No Work shall be performed until the Shop Drawings have been accepted by the Owner, and the Contractor shall be responsible for all costs and damages, which may result from proceeding prior to the approval of the Shop Drawings.

45. SEQUENCE OF CONSTRUCTION OPERATIONS

A. It is mandatory that the premises continue to be occupied and facilities therein shall continue to function during the performance of the construction work.

B. Detailed sequence of construction and availability of spaces in areas through which services must pass shall be coordinated between the Owner and the Contractor, before actual commencement of the Work.

1) To enable the Work to be laid out and prosecuted in an orderly and expeditious manner, Contractor shall provide a proposed Progress Schedule, within fifteen (15) days after the issuance of the Notice to Proceed of this Contract unless otherwise directed in writing by the Construction Administrator. The proposed Progress Schedule shall show the anticipated time of commencement and completion of each of the various operations to be performed under this Contract; together with all necessary and appropriate information regarding the sequence and correlation of Work; and the Schedule of Shop Drawings and delivery of all materials and equipment required for the Work. The Contractor shall prepare a Master Progress Schedule (Schedule) for the Work. Contractor as directed by the Construction Administrator shall revise the proposed Schedule until each activity is properly sequenced to provide that the Work will be completed in the proper order and

within the allotted Contract duration, without any conflicts. When the Construction Administrator has accepted the Schedule the Contractor will sign it. The Contractor shall then provide one (1) copy of such approved Schedule to each Subcontractor and two (2) copies to the Construction Administrator. Contractor shall afford its Subcontractors a reasonable opportunity for the introduction and storage of their materials and the execution of their Work and shall properly connect and coordinate its Work with others.

Contractor shall strictly adhere to the Schedule unless changed as provided for in the following paragraph.

2) Within five (5) days after receiving notice of any change in the Contract, or of any Extra Work to be performed, or of any suspension of the whole or any portion of the Work, or of any other conditions which are likely to cause or are actually causing delays, Contractor must notify the Construction Administrator in writing of the effect, if any, of such change or Extra Work or suspension or other condition upon the previously approved schedule, and must state in what respects, if any, the Schedule should be revised, with the reasons therefor. These proposed changes in the Schedule shall be reviewed and, if appropriate, approved, in writing, by the Construction Administrator. Contractor must strictly adhere to the revised Schedule. Distribution of the revised Schedule shall be as described in paragraph B-1 above. Contractor's compliance with the requirements of this paragraph is in addition to, and not in lieu of, compliance with other notice requirements pertaining to delays and extensions of time contained elsewhere in the contract.

3) The Schedule shall be reviewed by Contractor every two (2) weeks or as directed by the Construction Administrator.

4) If Contractor shall fail to adhere to the approved Schedule, or to the Schedule as revised, they must promptly adopt additional means and methods of construction with no additional cost to the County that will make up for the lost time and will assure completion in accordance with such Schedule. The proposed means and methods shall be described in writing to the County within two (2) days after the Contractor discovered or should have reasonably discovered that the Schedule would not be met as originally proposed. Failure to comply with this requirement may result in the County enforcing its rights under the Contract including, without limitation, default of the Contract.

C. From time to time as the Work progresses and in the sequence indicated by the approved Schedule, the Contractor must submit to the Construction Administrator a specific request in writing for each item of information or approval required. These requests shall be submitted sufficiently in advance of the date upon which the information or approval is actually required by the Contractor to allow for the time the Construction Administrator may reasonably take to act upon such submissions or resubmissions. The Contractor shall not have any right to an Extension of Time on account of delays due to its failure to timely submit requests for the information or approvals.

D. Certain construction work shall be required, which will be disruptive to the Owner's staff insofar as noise, dirt and dust is concerned. The Contractor, therefore, shall

perform such work during other than normal working hours. Subject to the requirements of law, the Owner imposes no limitation on the Contractor's working hours and whatever overtime work may be necessary or required shall be considered by the Contractor and reflected in its Bid Proposal without the benefit of extra compensation.

46. PROTECTION

A. The Contractor shall at all times exercise all necessary precautions for the safety of the public, employees performing the work and County personnel. The Contractor shall provide and maintain barricades, danger signals and other safeguards about the work and shall be held responsible for all accidents or damages to persons or property caused by failure to do so throughout the progress of the work, and shall comply with all applicable provisions of Federal, State and County Safety Laws.

B. The Contractor shall during the performance of its work, protect at all times all adjacent portions of the existing surfaces and existing equipment from damage due to the performance of the construction work.

C. The Contractor shall furnish temporary facilities and/or temporary dust-proof partitions separating all work areas and access routes from those areas not involved in active alterations, so that this work will not interfere with the Owner's access or normal use of areas not allocated to the Contractor, or any essential service to such areas, when ordered by the Construction Administrator.

47. CLEANUP AND REMOVAL OF DEBRIS

A. At the end of each working day, the Contractor shall sweep up and collect all the rubbish and place it in appropriate containers, furnished by the Contractor. Containers shall be kept at a location on, or adjacent to the work site, as designated by the Construction Administrator. Wood or cardboard crates and other debris of a similar nature shall be broken up, securely bundled and neatly stacked alongside the containers. Once each week and at the completion of the work, the Contractor shall remove all accumulated debris and rubbish.

B. At the completion of the work, the Contractor shall clean all equipment, fixtures, surfaces and accessories, removing all dust and other foreign matter, ready for use by the Owner.

48. TEMPORARY SERVICE

A. Sanitary facilities will be provided by the Owner for the Contractor and its personnel.

B. The Owner will supply and pay for the cost of all-temporary water and temporary electric power (120 volt, 60 hertz). The Contractor shall furnish and install all temporary electrical and water connections required for work under this Contract, at and to locations as designated by the Construction Administrator.

49. OPERATING TESTS

A. Where operating tests are specified the Contractor shall test the work as it progresses and shall make satisfactory preliminary tests in all cases before applying to the Engineer for official tests.

B. Official tests will be made in the manner specified for the different branches of the work, in the presence of the Construction Administrator or Engineer. Should defects appear they shall be corrected by the Contractor and the test repeated until the installation is acceptable to the Construction Administrator or Engineer and to any authorities having jurisdiction.

C. No work of any kind shall be covered or enclosed before it has been tested and approved.

D. The Contractor shall furnish all materials and apparatus, make connections and conduct tests, without extra compensation unless noted otherwise.

50. OPERATING INSTRUCTIONS AND PARTS LISTS

A. Where the Specifications require any Contractor to supply equipment operating and maintenance instructions and spare parts lists prior to the completion of the work it shall provide three copies of the publications for each piece of equipment he has furnished and installed under the Contract, upon receipt of the approved shop drawings.

B. Publications shall be prepared for the specific equipment furnished and installed, containing the following information, and shall not refer to other sizes, types or models of similar equipment:

1) Clear and concise instructions for the operation, adjustment, lubrication and other maintenance of the equipment, including a complete lubrication chart.

2) A complete listing of all parts for the equipment, with catalog numbers and other data necessary for ordering replacement parts.

C. Advertising literature will not be acceptable.

51. CUTTING AND PATCHING

Contract with Single Bid:

A. Where the project does not involve separate bids pursuant to the New York General Municipal Law the following will apply:

1) Where walls, floors, ceilings, roofs or other items require cutting for the installation of new work, all such cutting shall be done by the Contractor with the approval of the Construction Administrator; and the Contractor shall patch the opening to make the cut portions match the adjacent finished surfaces, unless otherwise indicated.

2) The Contractor shall not endanger any existing condition by its operations.

3) The cost of all cutting and patching caused by the Contractor's negligence shall be

borne by the Contractor.

Contract with Separate Bids:

B. If the project is one where separate bid specifications are required pursuant to the New York General Municipal Law the following will apply:

1) A sufficient time in advance of the construction of new floors, walls, ceilings, roofs, or other items, each Contractor shall be responsible for properly locating and providing in place all sleeves, inserts and forms required for their work, and shall furnish the Contractor for General Construction with complete information relative to exact locations and dimensions of all required openings in the General Contractor's work. Other Contractors shall periodically consult the Job Progress Chart of the General Contractor so that they will not be delayed by their work requirements, but the General Contractor shall be obliged to give all other Contractors at least seventy-two hours notice before commencing the previously mentioned new construction work.

2) The cost shall be borne by the responsible Contractor for all cutting, patching, re-waterproofing and re-caulking of new work necessary for reception of the work of a Contractor, caused by the Contractor's failure to timely or properly locate and provide in place all sleeves, inserts and forms required for its own work, or by a Contractor's failure to inform the General Contractor of required openings. The General Contractor shall do all cutting, patching, re-waterproofing and re-caulking of all new work no matter how or by whom such work was caused and shall be reimbursed for such extra work by the responsible Contractor, in accordance with the terms of the Contract. All cutting and patching shall have prior approval of the Construction Administrator.

3) Where sleeves, inserts, forms or openings are required in existing walls, floors, ceilings roofs, or other existing items, all necessary cutting, patching, re-waterproofing and re-caulking required shall be done by the individual responsible Contractor, except for finished surfaces. The responsible Contractor shall do all rough patching to bring the cut areas to the proper surface ready to receive the finished surface. All finishing work required to make the cut portions match the adjacent finished surfaces shall be performed by the General Contractor.

4) Each Contractor shall be responsible for coordinating their work with the work of all other Contractors engaged on the project. If directed, Contractors shall submit coordinated shop drawings showing how the fitting of the various parts of the work will be accomplished, for the Construction Administrator’s acceptance.

5) All cutting and patching shall be governed by the applicable divisions of the Specifications with regard to workmanship, materials and methods.

6) No Contractor shall endanger any work by unauthorized cutting, excavating, or other alteration of the work, unless previously authorized by the Construction Administrator.

52. CONFLICTS AMONG CONTRACT DOCUMENTS

In the event of any conflict among the Contract Documents, the Contractor shall notify the Commissioner and comply with the Commissioner's interpretation, according to the following priorities:

Priority Order	Document
1…….	Modification issued after execution of Agreement
2…….	Agreement between Owner and Contractor
3…….	Addenda issued prior to the execution of the Agreement (Later date to take precedence)
4…….	Special Notices
5…….	Technical Specifications
6…….	Construction Drawings:
6A……..	Schedule on Construction Drawings
6B……..	Notes on Construction Drawings
6C……..	Large Scale Details on Construction Drawings
6D……..	Small Scale Details on Construction Drawings
7…….	General Requirements
8…….	Special Clauses
9…….	Information for Bidders and General Clauses

53. RECORD DRAWINGS

A. The Owner shall furnish, at the first job meeting, one set of "paper" copies of the contract drawing(s) - this is in addition to the five sets of contract drawings as described in the Article "Contract Drawings" of the General Requirements; for the Contractor's use to indicate change(s) as they occur for the duration of the construction work. Upon request from the Contractor, the County will supply the Contractor a copy of the original Contract Drawings in AutoCAD format.

B. The Contractor shall record neatly and legibly, using reasonable drafting care, all approved change(s) (including minor revisions or corrections of pipes, ducts, electric outlets, circuit panels and other features, as well as invert elevations and locations of underground lines).

C. When all approved changes are recorded and clearly identified, the Contractor shall prepare a set of "as-built" (record) drawings, in the latest version of AutoCAD, using the approved County format and associated CAD layering guidelines, with 24" x 36" drawing sizes, showing the project as built including all changes in the work made during construction based on marked-up prints, drawings, and other data. These drawings shall be filed on a CD and submitted to the Construction Administrator.

D. All additional "paper" or reproducible drawings are to be obtained by the Contractor at their own expense.

54. TIME

A. All time limits (see Article "Required Time For Completion Of The Work" of the General Requirements, and, Article "Time Of Starting" of the Information For Bidders) stated in the specifications are of the essence of the Contract.

B. The Contractor may perform all necessary labor during other than normal working hours. The Owner imposes no limitation of the Contractor's working hours and whatever overtime work may be necessary or required shall be considered by the Contractor and reflected in its Bid Proposal without the benefit or extra compensation. The Contractor must give a minimum of four (4) hours notice to the Construction Administrator when overtime Work is necessary. The Contractor shall promptly pay to the County the additional cost of the Engineer and Construction Administrator for inspection services during the overtime Work.

55. ACCELERATION OF THE WORK

The Owner may, at its sole discretion and for any reason, require the Contractor to accelerate the schedule of performance by providing overtime, extended day, extra crews, Saturday, Sunday and/or holiday work and/or by having all or any subcontractors designated by the Owner provide overtime, extended day, extra crews, Saturday, Sunday or holiday work by the Contractor's or his subcontractor's own forces, and such requirements is independent of and not related in any way to any apparent inability of the Contractor to comply with the schedule(s), Milestone(s) and/or completion date requirements, the Owner, pursuant to a written change order as signed by the Commissioner shall reimburse the Contractor for the direct cost to the Contractor of the premium time for the labor utilized by the Contractor in such overtime, extended day, extra crews, Saturday, Sunday or holiday work(but not for the straight time costs of such labor) together with any social security and state or federal unemployment insurance taxes in connection with such premium time. However, no overhead, supervision costs, commissions, profit or other costs and expenses of any nature whatsoever, including impact costs or costs associated with lost efficiency or productivity, shall be payable in connection therewith. Anything to the foregoing notwithstanding, in the event that the Contractor has fallen behind schedule or in the Owner's judgment appears likely to fall behind schedule, Owner shall have the absolute right to direct the Contractor to accelerate the performance of its work, including that of its subcontractors, and the full costs for such acceleration shall be borne solely by the Contractor.

56. ULTRA LOW SULFUR DIESEL FUEL

A. Contractors and Subcontractors operating onroad and nonroad vehicles to perform County work must power those vehicles with ultra low sulfur diesel fuel. Ultra low sulfur diesel fuel is any diesel fuel that has a sulfur content of no more than fifteen parts per million.

B. In addition, all onroad and nonroad diesel vehicles used to perform County work and equipped with a model year 2003 or older engine shall utilize the best available

technology[2] in accordance with the following schedule:

a) effective September 1, 2007 - 35% of all such motor vehicles used on this project;
b) effective September 1, 2008 - 65% of all such motor vehicles used on this project;
c) effective September 1, 2009 - 100% of all such motor vehicles used on this project.

C. All onroad and nonroad diesel vehicles to perform County work having a gross vehicle weight rating of more than 14,000 pounds shall utilize the best available technology or be equipped with an engine certified to the applicable 2007 United States Environmental Protection Agency ("EPA") standard for particulate matter as set forth in Section 86.007-11 of Title 40 of the Code of Federal Regulations or to any subsequent EPA standard for such pollutant that is at least as stringent, in accordance with the following schedule:

a) by September 1, 2007 - 35% of all such motor vehicles;
b) by September 1, 2008 - 65% of all such motor vehicles;
c) by September 1, 2009 - 100% of all such motor vehicles

D. Any contractor who violates any provision of Section 873.1329 shall be liable for a civil penalty not to exceed ten thousand dollars plus twice the amount of money saved by such contractor for failure to comply with this section.

E. Any contractor who makes a false claim may be liable for a civil penalty not to exceed twenty thousand dollars, in addition to twice the amount of money saved by such contractor as a result of having made such false claim.

F. Nothing in this section shall be construed to limit the County's authority to cancel or terminate a contract, deny or withdraw approval to perform a subcontract or provide supplies, issue a non-responsibility finding, issue a non-responsiveness finding, deny a person or entity pre-qualification as a vendor, or otherwise deny a person or entity public entity business.

G. If sufficient quantities of ultra low sulfur diesel fuel are not available to meet the needs of a contractor to fulfill the requirements of this contract, the Contractor may submit a written request to the Commissioner to use diesel fuel with a sulfur content of no more than thirty parts per million as long as the contractor shall use whatever quantity of ultra low sulfur diesel fuel that is available. Such determination shall be made in writing on a case by case basis upon written application to the Commissioner. If the Commissioner grants such authority it shall expire sixty days thereafter and may be renewed upon written request for additional periods of sixty days.

[2] Best Available Technology means a system for reducing the emission of pollutants which is based on technology verified by the U.S. Environmental protection Agency or the California Air Resources Board or which has been identified pursuant to NYC's Department of Environmental Protection that (1) reduces diesel particulate matter emissions by at least 85 percent, as compared to a similar engine operating on traditional diesel fuel without emission control technology, or reduces engine emissions to 0.01 grams diesel particulate matter per brake horsepower per hour or less; and 2) achieves the greatest reduction in emissions of nitrogen oxides at a reasonable cost and in no case produces a net increase in nitrogen oxides in excess of 10%.

H. The Contractor, in order to comply with Subsections B & C above, must retrofit its vehicles to include both of the following in order to comply with the Best Available Technology Requirements:

- Diesel Oxidation Catalysts (DOC)
- Crankcase Vent Filters (CVF)

If the Contractor wants to propose an alternative technology it must submit a written request to the Commissioner with sufficient detail to enable the Commissioner to make a determination as to whether to accept the alternative technology. Any approval of alternative technology must be in writing.

57. QUALIFIED TRANSPORTATION FRINGE PROGRAM

EXECUTIVE ORDER NO. 7-2005

Requires that contractors, concessionaires and vendors doing business with the County enroll in a Qualified Transportation Fringe Program as defined in §132(f)(1) of the IRS Tax Code for all contracts for goods or services of $100,000 or more in any twelve month period during the contract term if such contractor, concessionaire or vendor employs more than 25 individuals who utilize public transportation and/or pay for commuter parking at least 1 day per week regardless of whether those employees are engaged in work pursuant to the contract.

Bidders shall submit the signed statement on Proposal Page 34. Notwithstanding the above, a Bidder may submit a Waiver Application on Proposal Page 35 to the Commissioner.

58. USE OF FLUORESCENT LIGHT BULBS & ENERGY EFFICIENT BULBS

The use of incandescent light bulbs is prohibited in County-owned buildings and facilities. Only fluorescent light bulbs may be installed in County buildings and facilities. Exterior lights must utilize energy-efficient bulbs. For further details see Article 58 of the General Clauses.

59. COUNTY OF WESTCHESTER PHOSPHORUS-FREE LAWN FERTILIZER POLICY

Executive Order 8-2007 limits the use of lawn fertilizers containing phosphorous and other compounds containing phosphorous, such as phosphate on County owned property.

EXECUTIVE ORDER NO.8 OF 2007

WHEREAS, the New York City water supply watershed is a critical drinking water source for approximately eight million New York City consumers and approximately one million upstate consumers. Over eighty-five percent (85%) of Westchester County's residents consume water from the New York City water supply system; and

WHEREAS, eutrophication is a natural aging process of lakes or streams brought on by

nutrient enrichment. Eutrophication can be greatly accelerated by human activities that increase the rate at which nutrients and organic substances enter aquatic ecosystems from their surrounding watersheds; and

WHEREAS, as a result of accelerated eutrophication, enhanced plant growth reduces dissolved oxygen in the water creating severely impaired water bodies with unpleasant water taste and odor, discoloration, release of toxins and increased turbidity that interferes with the health and diversity of indigenous fish, plant, and animal populations and with the recreational use of rivers, lakes and wetlands. Consequently, eutrophication restricts water use for fisheries, recreation, industry, and drinking due to the increased growth of undesirable algae and aquatic weeds and the oxygen shortages caused by their death and decomposition; and

WHEREAS, nutrient pollution due to human activities is one of the leading causes of eutrophication in the NYC Watershed, and is specifically accelerated by the introduction of excessive phosphorus into the environment. In fact, most reservoirs in the East of Hudson portion of the New York City Watershed (5 of the 7 located in Westchester County) are designated as phosphorous-restricted basins in accordance with the New York City Watershed Rules & Regulations due to excessive phosphorous volumes which have not been reduced despite phosphorous reductions mandated by the New York State Department of Environmental Conservation (NYSDEC); and

WHEREAS, one unnecessary source of phosphorus pollution in the watershed is the many pounds oflawn fertilizer applied by residents and businesses in the County of Westchester each year; and

WHEREAS, when phosphorus fertilizer is applied to phosphorus-rich lawns, much of the excess simply runs off of the lawn into the storm drainage systems where it can be carried into rivers, lakes, streams, and wetlands, causing eutrophication; and

WHEREAS, soil tests conducted pursuant to a six-year study by the Cornell Cooperative Extension, an extension of the State's designated Land-Grant University, have shown that approximately 90% of the lawns in Westchester County have medium-to-high levels of phosphorus; and

WHEREAS, the New York City Watershed Pesticide and Fertilizer Technical Working Group, established by the New York City Watershed Memorandum of Agreement, issued a report in 2000, noting the high percentage of phosphorus in regional soils and recommending that phosphorus-based lawn fertilizers be added only when a soil analysis identifies phosphorus deficiencies.

WHEREAS, the proposed Stormwater Phase II regulations recently issued by the New York State Department of Environmental Conservation, and which are expected to go into effect in January of2008, will allow the use of phosphorus-based lawn fertilizers on municipally-owned land only where soil testing indicates that phosphorus concentrations are inadequate, in order to ensure that municipalities in the New York City Watershed are

taking satisfactory steps to achieve the above-referenced mandatory phosphorous reductions.

WHEREAS, the United States Environmental Protection Agency has also determined that a Nonpoint Source Implementation Plan was necessary in the Croton Watershed because the phosphorus reductions necessary to meet the targeted applicable water quality standards could not be achieved by wastewater treatment plant upgrades alone; and

WHEREAS, Section 110.11 of the Laws of Westchester County places the responsibility to supervise, direct and control, subject to law, the administrative services and departments of the county, upon the County Executive; and

WHEREAS, I have determined that restricting the application and use of lawn fertilizer containing phosphorus on all County-owned property will address one source of unnecessary and preventable phosphorus pollution and will improve water quality in the County; and

WHEREAS, the Department of Planning, after review of the applicable regulations under the State Environmental Quality Review Act, has advised that this Executive Order has been classified as a Type II action, pursuant to 6 N.Y.C.R.R. § 617.5(c)(20), "routine or continuing agency administration and management, not including new programs or major reordering of priorities that may affect the environment," and 6 N.Y.C.R.R. § 617.5(c)(27), "adoption o fregulations, policies, procedures and local legislative decisions in connection with any action on this list." As such, no further environmental review is required.

NOW THEREFORE, I, , County Executive of the County of Westchester, in light of the aforementioned, do hereby order and direct each and every department, board, agency, and commission of the County of Westchester under my jurisdiction to ensure that the policies and procedures set forth in the following Phosphorus-Free Lawn Fertilizer Policy are complied with.

COUNTY OF WESTCHESTER
PHOSPHORUS- FREE LAWN FERTILIZER POLICY

I. Definitions:

(1) "Certified laboratory" means any laboratory certified by the New York State Department of Health pursuant to section five hundred two of the New York State Public Health Law to conduct soil analysis.

(2) "Commercial fertilizer" means any substances containing one or more recognized plant nutrients which is used for its plant nutrient content, and which is designed for use or claimed to have value in promoting plant growth, except unmanipulated animal or vegetable manures, agricultural liming material, wood ashes, gypsum and other products exempted by regulation of the New York State Commissioner of Agriculture and Markets.

(3) "Lawn fertilizer" means a commercial fertilizer distributed primarily for non-farm use, such as lawns, shrubbery, flowers, golf courses, municipal parks, cemeteries, greenhouses and nurseries, and such other use as the commissioner may define by regulation. Lawn fertilizer does not include fertilizer products intended primarily for garden and indoor plant application.

II. Use and Application of Lawn Fertilizer:

(1) Any lawn fertilizer that is labeled as containing more than 0% phosphorus or other compound containing phosphorus, such as phosphate, shall not be applied upon any County-owned property, except as provided in section III. Of this Executive Order.

(2) No lawn fertilizer shall be applied upon County-owned property when the ground is frozen.

(3) Lawn fertilizer shall not be applied to any impervious surface upon County-owned property, including parking lots, roadways, and sidewalks. If such application occurs, the fertilizer must be immediately contained and either applied to turf in a manner consistent with this Executive Order or placed in an appropriate container.

III. Exemptions:

The prohibition against the use of lawn fertilizer under section II of this Executive Order shall not apply to:

(1) Newly established turf or lawn areas during their first growing season.

(2) Turf or lawn areas that soil tests, performed within the past three years by a certified laboratory or by the Cornell University Cooperative Extension of Westchester County, confirm the need for additional phosphorus application in accordance with the phosphorus levels established by the Cornell University Cooperative Extension of Westchester County. The lawn fertilizer application shall not contain an amount of phosphorus exceeding the amount and rate of application recommended in the soil test evaluation.

(3) Agricultural uses, vegetable and flower gardens, or application to trees or shrubs.

IV. The transition to phosphorus-free lawn fertilizer shall occur as soon as possible in a manner that avoids wasting of existing inventories; accommodates establishment of supply chains for new products; enables the training of County employees and licensees in appropriate work methods; and allows the phase-out of products and practices inconsistent with this Executive Order. However, in no event shall lawn fertilizer containing phosphorus (i.e., labeled as containing more than 0% phosphorus or other compound containing phosphorus, such as phosphate) be applied upon County-owned property after January 1,2009, unless an exemption set forth in Section III of this Executive Order applies.

V. This Executive Order shall take effect on the date hereof, and shall remain in effect until otherwise superseded, repealed, modified or revoked.

Westchestergov.com

George Latimer, Westchester County Executive

4. SPECIAL CLAUSES

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

SPECIAL CLAUSES

1. INTENT

The Special Clauses modify or supplement the Information to Bidders, the General Clauses and the Standard Itemized Specifications and govern where there is conflict with those documents.

2. CONTRACT ITEMS

All Materials of Construction, General Construction Items and Item Specifications, and Roadside Development Payment Items and Item Specifications not prefixed with the letter "W" shall be as specified in Section 200 thru 600 of the latest version of the State of New York, Department of Transportation Design and Construction Division Standard Specifications including any Addenda thereto, hereafter referred to as the "NYSDOT Standard Specifications". In utilizing the State Standard Specifications, the following substitutions in the text shall be made:

A. For State, substitute County of Westchester.

B. For Department or Division, substitute Westchester County Department of Public Works and Transportation.

C. For Superintendent or Deputy Superintendent, substitute Commissioner of Public Works and Transportation.

D. For Chief Engineer, Deputy Chief Engineer, District Engineer, or Engineer in Charge, substitute Engineer.

E. For Comptroller, substitute Commissioner of the Westchester County Department of Finance.

Copies of the State publication are available for reference purposes in the offices of the Engineering Division, Westchester County Department of Public Works and Transportation, Room 500, County Office Building, White Plains, New York. They are also available on line at the NYSDOT website.

3. PRE-CONSTRUCTION CONFERENCE

The Contractor shall not commence any work under the contract prior to a pre-construction conference between the Contractor, the County's representatives and other concerned governmental and utility company representatives. At this conference all special requirements of the work, the scheduling of the work and details for the proper maintenance and protection of traffic during the work will be fully explained and discussed.

In the event the Contractor desires to use traffic control devices other than those specified, it shall submit his request with samples or detailed sketches and descriptions of the proposed devices, for approval by the County.

SPECIAL CLAUSES

4. PRESERVATION OF NATURAL FEATURES

The Contractor shall exercise the utmost care to preserve and protect the natural features of all public and private property on or adjacent to the work site which will not be directly affected by the required construction. Before commencing work under the contract, the Contractor shall secure the Engineer's approval of proposed locations for temporary access roads not specified, storage areas for his equipment and materials, and parking areas for his own vehicles and those of his workmen. Thereafter, unless otherwise approved by the Engineer, the Contractor shall restrict all such activities to these locations. Before completion of the contract work, the Contractor shall restore at his own expense to their original condition or better, all temporary access, storage or parking areas and all other areas on or adjacent to the work site not directly affected by the required construction which have been disturbed in any way by the Contractor's operations.

The Contractor shall be responsible for the preservation and protection of all parts of existing trees within and bordering on the contract limits. As may be required, at his own expense the Contractor shall protect the trunks of trees against injury by the proper use of burlap padding, boards or other protective devices and means approved by the Engineer.

5. USE OF EXPLOSIVES

Unless expressly permitted by the contract documents, no blasting shall be allowed.

If blasting is permitted, explosives for blasting shall be stored, handled and used in accordance with the laws, ordinances and regulations of the State of New York and the local municipalities involved, and following the safety recommendations contained in the latest edition of the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, Inc., and the latest editions of the pamphlets published by the Institute of Makers of Explosives entitled, "Do's and Don'ts - Instructions and Warnings in Using, Transporting, Handling and Storing Explosives" and "Safety in the Handling and Use of Explosives".

The Contractor shall limit all blasting operations to a minimum and shall notify the Engineer and local municipal authorities at least seventy-two hours in advance of all such operations. No blasting of any kind shall be done during other than normal working hours on normal working days, unless permission is first secured from the Engineer and from local municipal authorities. The Contractor shall protect the traveling public from all damage to person and property and shall be responsible for damage to pipe lines, conduits, cables and any other surface or subsurface lines or structures that may be encountered, and for damage caused by blast shocks or debris.

The Contractor shall utilize only thoroughly trained and experienced men in all blasting operations, and blasting crews shall be held to the minimum consistent with efficient operation. They shall be thoroughly familiar with all recommended safety practices and shall be adequately supervised to insure that they adhere to those practices. No person under eighteen years of age shall be permitted to handle, use or be near explosives.

SPECIAL CLAUSES

In accordance with the New York State Penal Law, Section 1918 as amended, the Contractor or his subcontractor shall not discharge explosives in the ground unless written notice is first given seventy-two hours in advance to the person, corporation or municipality engaged in the distribution of combustible gas in the area. It shall further ascertain if there are any gas lines within a radius of two hundred feet from the point of discharge which are being maintained by a person, corporation or municipality other than the person, corporation or municipality servicing the territory. If there are, it shall give written notice seventy-two hours in advance to those parties. Thereafter the work shall be performed in such manner as to avoid damages to any pipe conveying combustible gas.

In any emergency, if explosives must be discharged in order to protect persons from immediate and substantial danger of death or serious personal injury, the seventy-two hour notice requirements of this article will be waived, provided the Engineer, the concerned persons, corporations or municipalities are notified as soon as reasonably possible before any such discharge is undertaken.

6. CONSTRUCTIONS, EXCAVATION AND DEMOLITION CONTRACTS AT OR NEAR UNDERGROUND FACILITIES - INDUSTRIAL CODE RULE NO. 53

The utility companies can be alerted to impending construction by the Contractor by contacting the Underground Utilities Call Center at 811 or 1-800-962-7962.

Notification to the Call Center is the responsibility of the Contractor who must allow ample time for investigation and identification of any and all services of the utility companies located at the project site.

All costs associated with verification of the location of underground facilities pursuant to Industrial Code Rule No. 53, as amended shall be included in the prices bid for the respective contract items involved unless separate payment is otherwise provided for in the Contract. All test holes excavated, by written direction of the Engineer, for purposes other than for compliance with Industrial Code Rule No. 53 or Subsection 105-06 of the Standard Specifications, will be paid for at the unit bid price for Trench and Culvert Excavation in the Contract unless a test pit item is expressly included in the contract.

7. CONSTRUCTION NEAR PIPES CONVEYING COMBUSTIBLE GAS

In accordance with the New York State Penal Law, Section l9l8 as amended, the Contractor shall not excavate any existing street, highway or public place unless written notice shall have been given at least seventy-two hours in advance to the person, corporation or municipality engaged in the distribution of gas in such territory. It shall further ascertain whether there is within one hundred feet in such street, highway or public place any other person, corporation or municipality conveying combustible gas in pipe, and if there is such pipe, it shall also give similar notice to such person, corporation or municipality.

8. NOTICES TO UTILITY OWNERS

At least 3 working days before breaking ground for construction, the Contractor shall give written notice to all concerned utility owners that valve boxes, curb boxes, manholes and

other similar structures must be adjusted to the finished surfaces of roadway, shoulder or sidewalk areas, or that pipes, conduits, poles or other structures must be altered, removed or relocated. Thereafter the Contractor shall give a reasonable opportunity to the owner of the utility or structure to have the work done. All work adjusting structures or altering, removing, relocating or installing pipes, conduits, poles or other structures will be done at the expense of the owners of the utility or structure, utilizing their own facilities if they so choose, or by utilizing the forces of the Contractor under separate contract.

9. FILLING AND BACKFILLING AT STRUCTURES, CULVERTS AND PIPES

All filling and backfilling at structures, culverts and pipes shall be done in accordance with the provisions of Section 200, Earthwork; subsection 203-3.15, "Fill and Backfill at Structures, Culverts and Direct Burial Cables", in the New York State Department of Transportation Specifications,

10. PIPES AND CULVERTS IN FILL AREAS

Where pipes or culverts are to be placed in fill areas, the Contractor shall first place and compact the fill to a plane one foot above the design elevation of the top of the pipe and thereafter excavate the trench.

11. PAYMENT LINES AND LIMITS

Payment Limit - A payment limit defines the boundary beyond which no quantities will be measured for payment. Whenever payment limits are indicated, only the work which is actually directed and completed within these limits will be measured and computed for payment. Payment limits may be revised in writing by the Engineer prior to performing the work.

Payment Line - Defines the exact line from which the work quantity will be computed. Whenever payment lines are indicated, quantities representing work completed will be computed from these lines only. No other lines or locations will be used to compute quantities. Payment lines may be revised in writing by the Engineer prior to performing the work.

12. PIPE CERTIFICATION DOCUMENTS

Prior to the delivery of any pipe to the construction site, the Contractor shall furnish properly attested documents certifying as to the type, class, name of manufacturer and source of supply of the pipe. One copy of each document shall be forwarded to the Engineer at the construction site and to the appropriate contact at the Department of Public Works and Transportation as determined by the Engineer, County Office Building, White Plains, New York.

13. AREAS INACCESSIBLE TO ROLLER

In areas inaccessible to conventional compactors, or where maneuvering space is limited, impact rammers, plate or small drum vibrators, or pneumatic buttonhead compaction equipment may be used with layer thickness not exceeding 6 inches before compaction.

However, materials placed for subbase course construction shall have a maximum compacted thickness of 6 inches. Hand tampers shall not be permitted. The Engineer may approve or reject any of the above described mechanical devices based upon the results of appropriate on-site field tests.

14. DELIVERY OF MATERIALS

The Contractor shall make his own arrangements for the receipt of materials delivered to the construction site. No representative of the County will accept any materials ordered by the Contractor.

15. BITUMINOUS PAVEMENT ON EXISTING CONCRETE PAVEMENT

Where bituminous pavement of any type is to be placed on existing concrete pavement, the Contractor shall prepare the road surface as specified under Section 600, Incidental Construction, subsection 633, Conditioning Existing Pavement Prior to Hot Mix Asphalt (HMA) Overlay.

Prior to the placement of asphalt concrete pavement on existing concrete pavement, a tack coat of bituminous material as specified in the contract documents shall be applied to the cleaned concrete pavement at a rate as specified in the contract documents, subject to the directions of the Engineer. Payment for the foregoing work shall be deemed to be included in the unit price the Contractor has bid for the appropriate asphalt concrete item.

Prior to the placement of asphalt concrete pavement, the contact surfaces of all structures within or adjacent to the area of the new pavement shall be painted with the same bituminous material.

16. RESURFACING AT STRUCTURES NOT RAISED

Prior to the placement of resurfacing material, the Contractor shall cut out and remove the existing bituminous pavement within the area so indicated on the plans or five feet distance from all exterior faces of each structure not requiring raising for the resurfacing work, in accordance with the instructions of the Engineer. Payment for all the foregoing work shall be deemed to be included in the unit price the Contractor has bid for the various items of the Contract.

17. REPLACEMENT OF EXISTING CASTINGS

All municipally owned castings which are excessively worn or are cracked shall be replaced when ordered by the Engineer. Existing castings shall be removed utilizing equipment and in a manner approved by the Engineer, and disposition of the castings shall be in accordance with Article 21, "Salvable Materials" of the Special Clauses. The design of new castings shall conform to the standards of the municipality in which the work is being performed, unless otherwise directed by the Engineer. After castings have been set in place, they shall be painted with asphaltum or other approved coating material.

Payment for the work of removing existing castings and furnishing and placing new castings shall be deemed to be included in the unit price the Contractor has bid for the item of work indicated in the Itemized Proposal, or from Item W800, Miscellaneous Additional Work, when so ordered by the Engineer, except that castings broken through the sole negligence of the Contractor shall be removed and replaced by him at his own expense.

18. PROTECTION OF PAVEMENT

No equipment other than equipment with rubber tires will be allowed on any existing pavement to remain or new pavement within the limits of the contract, unless the pavement has been first protected by planking or other means approved by the Engineer.

19. PROTECTION OF STRUCTURES FROM BITUMINOUS MATERIALS

Before applying any bituminous materials, the Contractor shall protect as may be necessary all inlets, catch basins, manholes, vaults, water valve boxes, walls, curbs, gutters and other similar structures to prevent their defacement by such materials. Structures shall be completely covered or treated to prevent bituminous materials from entering their covers, gratings or crevices, or to prevent their concealment. After the application of the bituminous materials has been completed, the Contractor shall inspect all structures within the area of such construction activities and remove all remaining bituminous defacements caused by his operations.

20. SALVABLE MATERIALS

All existing construction materials such as manhole and catch basin frames and castings, pipe, curbs, signs, guide railings and other similar salvable materials encountered in the work and owned by the County, a political subdivision of the County or third parties, which the Engineer directs to be salvaged but not reused in the work, shall be removed and stored by the Contractor at areas on or adjacent to the work site. The Contractor shall then notify the respective owners in writing that the salvaged material is awaiting their disposition. If the material is not claimed or removed by the owners within a reasonable time after written notices have been given, as determined by the Engineer, the materials shall then become the property of the Contractor and shall be removed by him before completion of the work under the contract.

Similar construction material which is removed by the Contractor and which the Engineer orders not to be salvaged, shall become the property of the Contractor and shall be immediately removed by him from the site of the work.

21. CLEANING OF CATCH BASINS AND MANHOLES

After completion of all other work under the contract, the Contractor shall thoroughly clean out all catch basins and manholes that have been built, altered or adjusted as part of the work of the contract, and shall remove from all other catch basins and manholes within the limits of the contract, all materials and debris deposited therein as the direct result of his operations under the contract. Payment for all the foregoing work shall be deemed to be included in the

unit prices that the Contractor has bid for the appropriate payment item for buildings, altering or adjusting catch basins and manholes.

22. NOISY MANHOLE COVERS

After the work of resurfacing old pavement or the placement of new pavement has been completed, the Contractor shall check all structures within the limits of the contract for the existence of noisy manhole covers. All such manhole covers shall then be treated with an approved anti-rattling compound, in accordance with the directions of the Engineer. Payment for all the foregoing work shall be deemed to be included in the unit prices the Contractor has bid for the appropriate payment item for building, altering or adjusting catch basins and manholes.

23. GUARANTEE OF THE WORK UNDER THE CONTRACT

Unless otherwise stated in other parts of the specifications, all work performed under the contract shall be guaranteed by the Contractor against all defects resulting from the use of inferior materials, equipment or workmanship, for a period of one year from the date of final completion and acceptance of the work, or from the date the County takes possession and makes full use of the constructed facility.

24. CONTRACT WORK BY GENERAL CONTRACTOR

Contract work amounting to not less than 51 percent of the executed contract price shall be performed by the Contractor's own organization which shall be construed to include only workmen directly employed and paid by the Contractor, and equipment owned or rented by the Contractor, such equipment being furnished with or without operators.

The only exception to the foregoing requirement shall relate to "Specialty Items" as designated by the County in these specifications or during the course of the actual contract construction work. "Specialty Items" shall be construed to be limited to contract work requiring highly specialized knowledge, craftsmanship or equipment not ordinarily available in the contracting organizations qualified to bid on this contract as a whole, and in general, shall be limited to minor components of the total contract. Such "Specialty Items" of the contract work may be sublet by the Contractor, but only after he has solicited permission to do so from the County and the County has granted such permission and has approved the Contractor's proposed subcontractor.

The total sum of all County approved "Specialty Item" subcontracts as negotiated directly by the Contractor will be deducted from the contract price as executed between the Contractor and the County, before the County computes the final dollar amount of contract work that the Contractor must and shall perform with his own organization.

25. EXISTING VEGETATION

The Contractor shall give particular attention and care to protect from damage all existing vegetation, including turf, trees, ornamental plantings, etc., which is not within the actual

construction limits. Every attempt shall be made to protect and save the vegetation that is near the construction limits according to the instruction of the Engineer.

26. EXISTING ROADS

Existing roads used for the hauling of materials shall be kept free from debris and maintained by the Contractor and left in a condition satisfactory to the Engineer. The Contractor is warned that it shall be held responsible for any damage to County, Town, City or Village roads or streets caused by the operation of his equipment, and that adequate repairs for such damage shall be required at his expense.

27. SIGN RELOCATIONS

All regulatory and directional traffic signs that require relocation due to roadway widening or other appurtenant work, as directed by the Engineer, will be done so by the Contractor with no direct payment for said work. The cost for this sign removal and relocation shall be deemed included in the various items of the Contract..

28. PORTLAND CEMENT CONCRETE

Unless otherwise specified, it is intended that all concrete placed under the Contract shall be air-entraining concrete. The type of Portland Cement to be used shall be Type 2 with an approved air-entraining agent as specified in Section 701-01 Portland Cement and Section 711-08 Admixtures of the Standard Specification. The amount of air-entrainment shall be as required in Table 501-3 of the same specifications.

29. ACCURACY OF PLANS AND SPECIFICATIONS

The detail plans and specifications for the contract have been prepared with care and are intended to show as clearly as is practicable the work required to be done. The contractor must realize however, that construction details can not always be accurately anticipated and that in executing the work, field conditions may require reasonable modifications in the details of the plans and quantities of work involved. Work under all items in the contract must be carried out to meet these field conditions to the satisfaction of the Engineer and in accordance with his instructions and the contract specifications.

The Contractor shall take no advantage of any apparent errors or omission in the plans or specifications. In the event the Contractor discovers an error or omission in the plans or specifications, it shall immediately notify the Engineer. The Engineer will then make such corrections and interpretations as may be deemed necessary for fulfilling the intent of the plans and specifications.

30. CONFORMITY WITH PLANS AND SPECIFICATIONS

All work performed and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions and materials requirements, including tolerances, shown on the plans or indicated in the specifications.

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Plan dimensions and contract specification values are to be considered as the target value to be strived for and complied with as the design value from which any deviations are allowed. It is the intent of the specifications that the materials and workmanship shall be uniform in character and shall conform as nearly as realistically possible to the prescribed target value or to the middle portion of the tolerance range. The purpose of the tolerance range is to accommodate occasional minor variations from the median zone that are unavoidable for practical reasons. When a maximum or minimum value is specified, the production and processing of the material and the performance of the work shall be so controlled that material or work shall not be preponderantly of borderline quality or dimension.

In the event that the Engineer finds he materials or the finished product in which the materials are used not within reasonably close conformity with the plans and specifications but that reasonably acceptable work had been produced, he shall then make a determination if the work shall be accepted and remain in place. In this event, the Engineer will document the basis of acceptance by contract modification which will provide for an appropriate adjustment in the contract price for such work or materials as he deems necessary to conform to his determination based on engineering judgment.

In the event that the Engineer finds the materials or the finished product in which the materials are used not within reasonably close conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.

All traffic control devices (signs, signals, markings, and devices placed by the authority of a public body or official having jurisdiction for the purpose of regulating, warning or guiding traffic) shall be in conformity with the edition of the New York State Manual of Uniform Traffic Control Devices which is current on the date of advertisement for bids.

31. STAKEOUT

The Contractor will establish the lines, grades and measurements necessary in his opinion to properly locate the work, by setting suitably marked offset or reference stakes. These stakes will be referenced to the control points, coordinates and similar data that may be shown on the contract drawings, but the County reserves the right to modify that information. The Contractor shall inform the Engineer a reasonable time in advance of the time and place he intends to do this layout work.

The Contractor carefully and properly preserve all stakes, pins and markers set, and if any are destroyed or disturbed, they shall be reset at no cost to the County. All existing property lines and survey monuments which may of necessity have to be disturbed during the construction work will be properly tied to fixed points and reset by the Contractor, and the cost of replacement of any other existing property lines and survey monuments or temporary witness stakes set by the Engineer, which are disturbed by the Contractor's operations, shall be charged against the Contractor and deducted from future payments.

The Engineer shall check all lines, grades and measurements established by the Contractor, and shall satisfy himself as to their accuracy before allowing construction of any required structure or facility.

SPECIAL CLAUSES

32. BAN ON WORK PERFORMED BY NON-COUNTY ENTITIES

Any work which may be required or desired by non-County of Westchester entities (i.e. Con Edison, the Telephone Company, Cable TV, other governmental agencies, private corporations or individuals, etc.) within the specified limits of the project shall in no manner be performed by said Contractor(s) or Subcontractors retained by The County of Westchester under this Contract unless prior written approval is granted by the Commissioner of Public Works.

33. SIGNIFICANT CHANGES IN THE CHARACTER OF WORK.

In accordance with 23 CFR 635.109(a)(3):

The Engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the Surety, and the Contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of work under the contract, whether such alterations or changes are in themselves significant changes in the character of work, or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profits, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made by the Department, either for or against the Contractor, in such amount as determined to be fair and equitable.

If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.

The term "significant change" shall be construed to apply only to the following circumstances: when the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or when a Major Item of work, defined as , is increased in excess of 125 percent, or decreased below 75 percent of the original contract quantity.

Any allowance for a change in unit price shall apply only to that portion of work in excess of 125 percent of the original contract item quantity, or in the case of a decrease below 75 percent, to the actual amount of work performed.

The County will administer the above Federal regulations as follows:

SPECIAL CLAUSES

The County may make, in writing, at any time during the work, any necessary changes in quantities and alterations to the work in order to satisfactorily complete the project. If the Contractor or the County discovers a change that constitutes a significant change in the character of work as defined below, the party discovering the change shall promptly provide the other party written notice of the significant change in the character of work before additional work is performed. The Contractor shall comply with notice and recordkeeping provisions of §104-06A 1 through 4, §104-06B 1 through 4 and §104-06C - Notice and Recordkeeping of the NYSDOT Standard Specifications.

The Contractor or the County, as the case may be, must make written notice to the other party of the existence of an apparent significant change in the character of work if that party wishes to adjust the contract price or time of performance, including direct costs and/or time related compensation, if applicable. Such notice shall be given within 15 calendar days of the time at which the party had knowledge, or should have had knowledge of an event, matter or occasion which results in a significant change in the character of work. The County will have no liability and no adjustment will be made for any damages which accrued more than 15 calendar days prior to the filing of such a notice with the Engineer.

Upon written notice, the Engineer will investigate the changes and if it is determined that the alterations or changes in quantities significantly change the character of work, whether such alterations or changes are in themselves significant changes in the character of work, or by affecting other work, cause such other work to become significantly different in character, an adjustment, excluding anticipated profits, will be made to the contract. The Engineer will make an initial response in writing to the Contractor, within 21 calendar days, with a determination whether or not an adjustment to the contract is warranted. Situations requiring examination of the site or input from other County personnel may require additional time to resolve. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made by the County, either for or against the Contractor, in such amount as determined to be fair and equitable.

No contract adjustment will be allowed unless the Contractor has provided the required written notice, or written notice was provided to the Contractor by the County.

If an agreement on an adjusted price has not been reached before the work begins, the Contractor shall keep daily records and make reports of all labor, material and equipment used in connection with such work and the cost thereof as specified in §30 – "Extra Work: Increased Compensation/Decreased Work: Credit To The Owner" of the General Clauses.

Compensation for increased costs of the work resulting from significant changes in the character of work will be made in accordance with §30 – "Extra Work: Increased Compensation/Decreased Work: Credit to the Owner" of the General Clauses.

Compensation for time related costs, if any, will be made in accordance with §26 – "Claims for Damages" and §27 – "Extensions of Time" of the General Clauses.

A. Character of Work. The term "significant change" shall be construed to apply only when the character of the work differs materially in kind or nature from that involved or included in the original proposed construction.

B. Major Items. The term "significant change" shall be construed to apply to Major Items only when the quantity of a Major Item is more than 125%, or is less than 75% of the original contract quantity. A Major Item is defined as:

Major Item: Any contract pay item for which the original unit bid price multiplied by the original item quantity exceeds the following minimum major item value based on total contract bid price.

Total Contract Bid Price	Major Item Value
≤ $1,333,333	$20,000
> $1,333,333 - $66,500,000	1.5% of the total contract bid price
> $66,500,000	$1,000,000

Any allowance for a change in the unit price shall apply only to that portion of work in excess of 125% of the original contract item quantity, or to the actual amount of work performed if the quantity decreases below 75% of the original contract item quantity. The Contractor or the County, as the case may be, must make written notice to the other party of the "significant change" in the quantity of a major item if that party wishes to adjust the contract price or time of performance. Knowledge of a "significant change" in quantity could result from receipt of a change order (approved or unapproved), a letter directing a change in the contract work, review of plan details and estimates, review of work completed or progress payment quantities, or a combination of the above.

Total payments made for all work on a Major Item that decreases to below 75% of the original contract item quantity, will not exceed the total payments which would have been made if the original contract quantity had been completed at the original unit price bid. No payments will be made for items eliminated in their entirety.

C. Minor Items. The term 'significant change' shall be construed to apply to Minor Items only when extra work both (1) increases the quantity of a Minor Item to more than 200% of the original contract quantity and (2) results in an increase of more than $5,000 from the original contract amount. A Minor Item is defined as:

Minor Item: Any contract pay item that does not meet the definition of a Major Item.

Any allowance for a change in the unit price shall apply only to that portion of work both in excess of 200% of the original contract item quantity, and in excess of $5,000 greater than the original contract amount.

D. Lump Sum Items. Certain items of work may be Lump Sum items, wherein a single bid amount is intended to provide payment for all necessary work during the execution of the contract. The term "significant change" shall be construed to apply to lump sum items only to the extent that changes in other contract work items result in a significant change in the character of work required to complete "Lump Sum" items of work.

SAMPLE FORMS

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

AFFIRMATIVE ACTION PROGRAM REQUIREMENT- SUBCONTRACTOR(S)

County of Westchester, Department of Public Works

(To Be Completed By Subcontractor and Submitted with Request to Utilize Subcontractor)

Affirmative Action Program

An approved Affirmative Action Plan shall be required for all Subcontractors for public work where the subcontracted work exceeds $50,000 or more than fourteen (14) persons are employed by the Subcontractor.

Does the Subcontractor participate in an approved Affirmative Action Program? Yes [ ] No [ ]

If Yes, give name of Program: _____

_____

If No, how many employees will the Subcontractor employ on this project? _____

An approved Affirmative Action Program shall mean a plan approved or adopted by Westchester County including but not limited to, the Home-Town Plan, the Recruitment Training Program or any other program approved or meeting the requirements of the State or Federal government.

The "Monthly Employment Utilization Report" of the Sample Forms, shall be filled out by the Contractor and/or Subcontractor(s) who are required to have an Affirmative Action Program, prior to the start of the work.

CONTRACTOR'S REPORT OF EMPLOYMENT AND WEEKLY AFFIDAVIT

County of Westchester, Department of Public Works

Contract No._____

Report No._____

Week(s) ending_____

Title of Contract and Location _____

Contractor or Subcontractor _____

Address _____

_____

_____

STATE OF)
COUNTY OF) SS.:

I,_____, being duly sworn, depose and say:

1. I pay or supervise the payment of the persons employed by_____
(Contractor or Subcontractor)
in connection with the above referenced contract;

2. During the payment period commencing on the ____ day of _____,

20____ and ending on the _____ day of _____, 20___, all persons employed by

_____ in connection with such contract have been paid in full
(Contractor or Subcontractor)
weekly wages and supplements earned by such persons except the following: (strikeout, if not applicable)

3. Such persons have been paid the prevailing rate of wages and the supplements as determined and required by Section 220 of the New York State Labor Law.

4. No rebates or deductions have been deducted from such wages and supplements except as authorized or required by applicable statutes or regulations of the Federal, State and County Governments.

5. The following is a true and accurate summary of wages and supplements paid:

_____During the week_____Total to date

Number of names on payroll _____

Hours worked _____

Total wages earned_____

6. I have read the foregoing statement of wages and supplement, know the contents thereof, and the same is true to my own knowledge.

_____

(Signature)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____ day of _____, 20___, before me personally came _____ to me known, and known to me to be the person who executed the above instrument, and who being duly sworn did say that he executed the same.

Sworn to before me
this _____ day of _____

_____

License No.

_____

Notary Public - State of New York

MONTHLY EMPLOYMENT UTILIZATION REPORT

County of Westchester, Department of Public Works

MONTHLY EMPLOYMENT UTILIZATION REPORT

JOB TITLE:

CONTRACT NO.:

WESTCHESTER COUNTY
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

NAME AND LOCATION OF CONTRACTOR:

REPORTING PERIOD:
FROM: ____________________
TO: ____________________

CONSTRUCTION TRADE	CLASSIFICATION	WORK HOURS OF EMPLOYMENT																	
		TOTAL ALL EMPLOYEES BY TRADE				BLACK (NOT HISPANIC ORIGNAL)		HISPANIC		ASIAN OR PACIFIC ISLANDERS		AMERICAN INDIAN OR ALASKAN NATIVE		MINORITY PERCENTAGE %	FEMALE PERCENTAGE %	TOTAL NUMBER OF EMPLOYEES		TOTAL NUMBER OF MINORITY EMPLOYEES	
		M	HRS	F	HRS	M	F	M	F	M	F	M	F			M	F	M	F
	JOURNEY WORKER																		
	APPRENTICE																		
	TRAINEE																		
	SUB-TOTAL																		
	JOURNEY WORKER																		
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	APPRENTICE																		
	TRAINEE																		
	SUB-TOTAL																		
TOTAL JOURNEY WORKER																			
TOTAL APPRENTICES																			
TOTAL TRAINEES																			
GRAND TOTAL (#HRS & #EMPL)																			

COMPANY OFFICAL'S SIGNATURE AND TITLE:

TELEPHONE NUMBER (Include Area Code):

DATE SIGNED:

PAGE: _________ OF _________

This report must be filled out by all contractors (both prime and sub) who are required to have an Affirmative Action Program, and must be filed with the Engineer by the 5th day of each month during the term of the Contract, and shall include the total work hours of each employee classification in each trade in the covered area for the Monthly Reporting Period. The Prime Contractor shall submit a report for its Aggregate Work Force and collect and submit reports for each subcontractor's Aggregate Work Force to the Engineer.

SHOP DRAWING SCHEDULE

County of Westchester, Department of Public Works

SHOP DRAWING SCHEDULE											
SPECIFICATION NUMBER	DESCRIPTION OF ITEM/MODEL #	SUBMISSION	REQUEST FROM CONTRACTOR TO MANUFACTURER	RECEIVED BY CONTRACTOR FROM MANUFACTURER	RECEIVED BY COUNTY FROM CONTRACTOR	RETURNED BY COUNTY TO CONTRACTOR	RETURNED BY CONTRACTOR TO MANUFACTURER	APPROVED BY COUNTY	APPROVED SHOP DRAWINGS TO MANUFACTURER FROM CONTRACTOR	INVOICE NO. AND SCHEDULED DELIVERY DATE	ACTUAL DELIVERY DATE
		ORIGINAL									
		2									
		3									
		4									
		ORIGINAL									
		2									
		3									
		4									
		ORIGINAL									
		2									
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		4									
		ORIGINAL									
		2									
		3									
		4									
		ORIGINAL									
		2									
		3									
		4									

SHOP DRAWING ID

County of Westchester, Department of Public Works

WESTCHESTER COUNTY DRAWING _____ OF _____

NAME OF PROJECT

_____

Date _____

Contract No. _____

Item/Model No. _____

Manufacturer _____

Contract Drawing No. _____

Specification Section _____

This document has been reviewed, coordinated and checked for accuracy of content and for compliance with the Contract Documents. The information contained herein has been coordinated with all other Contract Work.

Contractor _____

Signed _____

REQUEST FOR APPROVAL OF EQUAL

County of Westchester, Department of Public Works

SPECIFICATION NO.	ITEM	EQUAL

Attach a separate sheet here if more space is required.

REQUEST FOR APPROVAL OF SUBSTITUTIONS

County of Westchester, Department of Public Works

ITEM NO.	ITEM	SUBSTITUTION	COST OF SPECIFIED ITEM	COST OF SUBSTITUTED ITEM	SAVINGS TO COUNTY

Attach a separate sheet here if more space is required.

CONTRACTOR'S ULTRA LOW SULFUR DIESEL FUEL AFFIDAVIT

County of Westchester, Department of Public Works

Contract No. _____Period Included in this Report:_____, 20__ to _____, 20__

Title of Contract and Location_____
_____

Contractor _____
Address_____

Subcontractor _____
Address_____

STATE OF) ss.:
COUNTY OF)

I, _____being duly sworn, depose and say:
(print name) (print title)

1. I certify under penalty of perjury that I agree to comply with the requirements of Chapter 878, Article XIII, Section 873.13.29 of the Laws of Westchester County.
2. During the period _____ through _____, all diesel-powered vehicles, used in the performance of Contract No._____, were powered by ultra low sulfur diesel fuel (15 ppm Sulfur Maximum).
3. No fuel other than Ultra Low Sulfur Diesel Fuel (15 ppm Sulfur Maximum) was utilized on this project for the above described vehicles.
4. The annexed Ultra Low Sulfur Diesel Fuel Log is a true and accurate summary of the low sulfur diesel fuel (15 ppm Sulfur Maximum) purchased and utilized in the performance of this project.
5. I have read the foregoing statement, have full knowledge of the contents thereof, and it is my intent that the County of Westchester will rely on the statements contained herein.

_____
(Signature)

STATE OF) ss.:
COUNTY OF)

On this _____ day of _____, 20__, before me personally came _____ to me known, and known to me to be the person who executed the above instrument, and who being duly sworn did say that he/she executed the same.

Sworn to before me this

_____day of _____, 20__.

_____

Notary Public

The Ultra Low Sulfur Diesel Fuel-Log must be attached.

This Certification also has to be submitted by your subcontractor(s). *Additional copies of this form can be acquired from the Department of Public Work.*

ULTRA LOW SULFUR DIESEL FUEL (15 ppm Sulfur Maximum) – LOG

Period of Log: _____ through _____

Contract No. _____

Title of Contract and Location_____
_____

Contractor or Subcontractor_____
Address_____

Date of Purchase	Name and Address of Vendor (Print)	Gallons Purchased

A Separate Copy of this Certification will also have to be signed by each of your subcontractors that utilize diesel powered vehicles, fifty horsepower or greater, on the above project. *Additional copies of this form can be acquired from the Department of Public Works.*

Westchester gov.com

Westchester County • Department of Finance • Treasury Division

Electronic Funds Transfer (EFT) Vendor Direct Payment Authorization Form

Authorization is: *(check one)*

- ❒ New
- ❒ Change
- ❒ No Change

INSTRUCTIONS: Please complete both sections of this Authorization form and attach a voided check. See the reverse for more information and instructions (Forms Page 21). If you previously submitted this form and there is no change to the information previously submitted, ONLY complete lines 1 through 6 of section 1.

Section I - Vendor Information

1. Vendor Name:

2. Taxpayer ID Number or Social Security Number:

3. Vendor Primary Address

4. Contact Person Name: | Contact Person Telephone Number:

5. Vendor E-Mail Addresses for Remittance Notification:

6. Vendor Certification: *I have read and understand the Vendor Direct Payment Program and hereby authorize payments to be received by electronic funds transfer into the bank that I designate in Section II. I further understand that in the event that an erroneous electronic payment is sent, Westchester County reserves the right to reverse the electronic payment. In the event that a reversal cannot be implemented, Westchester County will utilize any other lawful means to retrieve payments to which the payee was not entitled.*

Authorized Signature | Print Name/Title | Date

Section II- Financial Institution Information

7. Bank Name:

8. Bank Address:

9. Routing Transit Number:

10. Account Type: (check one) ❒ Checking ❒ Savings

11. Bank Account Number: | 12. Bank Account Title:

13. Bank Contact Person Name: | Telephone Number:

14. FINANCIAL INSTITUTION CERTIFICATION (required **ONLY** if directing funds into a Savings Account **OR** if a voided check is not attached to this form): *I certify that the account number and type of account is maintained in the name of the vendor named above. As a representative of the named financial Institution, I certify that this financial Institution is ACH capable and agrees to receive and deposit payments to the account shown.*

Authorized Signature | Print Name / Title | Date

(Leave Blank - to be completed by Westchester County) - Vendor number assigned

Electronic Funds Transfer (EFT)
Vendor Direct Payment Authorization Form

GENERAL INSTRUCTIONS

Please complete both sections of the Vendor Direct Payment Authorization Form and forward the completed form (along with a voided check for the account to which you want your payments credited) to: Westchester County Board of Acquisition and Contract, 148 Martine Ave, Room 104, White Plains, NY 10601, Attention: Vendor Direct. Please see item 14 below regarding attachment of a voided check.

Section I - VENDOR INFORMATION

1. Provide the name of the vendor as it appears on the W-9 form.
2. Enter the vendor's Taxpayer ID number or Social Security Number as it appears on the W-9 form.
3. Enter the vendor's complete primary address (not a P.O. Box).
4. Provide the name and telephone number of the vendor's contact person.
5. Enter the business e-mail address for the remittance notification. THIS IS VERY IMPORTANT. This is the e-mail address that we will use to send you notification and remittance information two days prior to the payment being credited to your bank account. We suggest that you provide a group mailbox (if applicable) for your e-mail address. You may also designate multiple e-mail addresses.
6. Please have an authorized Payee/Company official sign and date the form and include his/her title.

Section II - FINANCIAL INSTITUTION INFORMATION

7. Provide bank's name.
8. Provide the complete address of your bank.
9. Enter your bank's 9 digit routing transit number.
10. Indicate the type of account (check one box only).
11. Enter the vendor's bank account number.
12. Enter the title of the vendor's account.
13. Provide the name and telephone number of your bank contact person.
14. If you are directing your payments to a Savings Account OR you can not attach a voided check for your checking account, this line needs to be completed and signed by an authorized bank official. IF YOU DO ATTACH A VOIDED CHECK FOR A CHECKING ACCOUNT, YOU MAY LEAVE THIS LINE BLANK.

DPW 10/08

SAMPLE CONTRACT AND BOND

FOR CONSTRUCTION

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

WESTCHESTERGOV . COM

DEPARTMENT OF PUBLIC WORKS
OFFICE OF THE COMMISSIONER

CONTRACT AND BOND

FOR CONTRACT

SAMPLE

NOTE: ONLY PROVIDED AS A SAMPLE IN THESE SPECIFICATIONS FOR INFORMATIONAL PURPOSES AND NOT TO BE EXECUTED WHEN SUBMITTING THE BID PROPOSAL. THE SUCCESSFUL BIDDER WILL BE REQUIRED TO EXECUTE THESE DOCUMENTS, AS MORE FULLY DESCRIBED IN THE PROPOSAL REQUIREMENTS.

CONTRACT NO. Amount of Contract $

THIS AGREEMENT made this _____ day of _____, 200__, by and between the COUNTY OF WESTCHESTER, a municipal corporation of the State of New York, hereinafter, "County", and

hereinafter called the "Contractor", WITNESSETH as follows:

WHEREAS, the Commissioner of Public Works, hereinafter called "Commissioner", by virtue of the power and authority in him vested did advertise for proposals and bids for:

Westchester County, New York, to furnish all labor, tools, implements and materials that may be requisite and necessary to the execution and completion of the work according to the plans, specifications, profiles and other drawings relating to such work, as approved by the County of Westchester and now on file in the Office of the Commissioner, and

WHEREAS, the Contractor did bid for said work in the manner and form as required by said plans and specifications and, being the lowest responsible bidder therefore, was duly awarded the Contract for such work at prices named in the itemized proposal by a resolution of the Board of Acquisition and Contract of the said County of Westchester.

NOW THEREFORE, the Contractor, in consideration of the prices so named for the various items of work to be paid for as hereinafter provided, does for itself, its representatives, agents, executors, administrators, successors or assigns, covenant and agree with the County that it, the said Contractor, shall and will at its own proper costs and charges and in conformity with said plans and specifications which are made a part of this Contract without setting forth same herein, provide all manner and kind of materials, molds, models, cartage, appliances and appurtenances required and of every description necessary for the due and proper performance of this Contract and the completion of said work to be done under the supervision and direction of the Commissioner, in a good workmanlike manner and in conformity with said plans and specifications without any alteration, deviation, additions, or omissions therefrom except upon due request and under the written direction of said Commissioner.

The Contractor acknowledges receipt of the "Information for Bidders, General and Special Clauses, Specification, Proposal and Plans" relating to this Contract, as well as all issued Addenda thereto, all of which are expressly incorporated in this Contract as if fully set forth herein.

SAMPLE

IT IS FURTHER UNDERSTOOD AND AGREED by and between the parties to this Contract that if in the opinion of the said Commissioner of the County of Westchester it shall become necessary to make any change in the work called by the plans and specifications which are a part of this Contract, whereby, consistent with the Information for Bidders, the work contemplated by said plans and specifications is modified and reduced and the costs and expenses of such work lessened, that then and in that event the Contractor will do the work as changed and modified and the said Commissioner shall estimate the difference between the original estimate of quantities therefor and the amount that should be paid by reason of the modification and change and the difference shall be deducted from the original estimate of quantities therefore of said Contract and said Contractor shall be paid accordingly. The estimate of said Commissioner shall be final and conclusive upon the parties hereto and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules. Any changes, modifications or deductions shall in no way invalidate this Contract and said Contractor agrees that in the event of any such change or modification reducing the original, estimated quantities therefore, it will not make any claim for any profit, or loss of profit by reason thereof. Notwithstanding any dispute or disagreement arising hereunder, Contractor agrees that the Work shall not be delayed nor disrupted by reason thereof.

The County hereby covenants and agrees with the said Contractor, in consideration of the covenants and agreements herein being strictly and in all respects complied with by the said Contractor as specified, that it will well and truly pay unto the said Contractor the unit prices set forth in the Proposal for the various items included in the Contract.

All partial payments will be made in accordance with the provisions set forth in the "Information for Bidders" and especially that part thereof which relates to "Estimates and Payments".

Furthermore, all partial payments will be made on the claim voucher and verified certificate of the Commissioner, both of which shall be filed in the Office of the Commissioner of Finance of the County of Westchester. The said claim voucher shall show the value of the work completed and the verified certificate shall show the said work was done in accordance with the plans and specifications.

With the final estimate the Contractor shall furnish to the Construction Administrator a sworn statement listing all unpaid bills and liabilities incurred under this Contract up to and including the date of the estimate. Where there are any bills or liabilities in excess of moneys due under any estimate under this Contract, the Construction Administrator may withhold payment of the estimate pending a satisfactory proof of settlement or adjustment of any excess claims. No final estimate will be approved or passed for payment unless and until the Contractor furnishes satisfactory proof that all bills and liabilities incurred under the Contract are paid in full and complies with the requirements of Section 220-a of the Labor Law.

Acceptance shall be effected as follows: whenever, in the opinion of the Commissioner, the Contractor shall have completely performed the Contract on his part to be performed, the Commissioner shall so certify in writing to the Board of Acquisition and Contract of the County and file such certificate with the said Board, stating therein, in substance that the work has been duly examined by him and that the same has been fully performed and completed in accordance

SAMPLE

with the terms of the Contract therefor, and recommending the acceptance thereof. When the Board of Acquisition and Contract by resolution duly adopts, approves and ratifies, the said acceptance shall be complete. No final payment shall be made under this Contract until such certificate of completion and recommendation of acceptance have been approved and ratified by a resolution of said Board of Acquisition and Contract.

Unless otherwise provided for in the contract documents, the Commissioner may take over, use, occupy or operate any part of the Work at any time prior to Final Acceptance upon written notification to the Contractor. The Engineer shall inspect the part of the Work to be taken over, used, occupied or operated, and will furnish the Contractor with a written statement of the Work, if any, that remains to be performed on such part. The Contractor shall not object to, nor interfere with, the Commissioner's decision to exercise the rights granted herein. In the event the Commissioner takes over, uses, occupies or operates any part of the work: (i) the Commissioner shall issue a written determination of Substantial Completion with respect to such part of the Work; and (ii) the Contractor shall be relieved of its absolute obligation to protect such part of the unfinished work in accordance with Article 20 of the General Clauses.

The Commissioner will approve a final estimate for final payment consistent with the authorization of final acceptance from the Board of Acquisition and Contract less previous payments and any and all deductions authorized to be made by the Commissioner under the Contract or law. Payment pursuant to such final estimate less any additional deductions authorized to be made by the Commissioner of Finance under the Contract or law shall constitute the final payment and shall be made by the Commissioner of Finance. If the contract is terminated prior to final acceptance the Commissioner is authorized to prepare a final payment as otherwise authorized by the Board of Acquisition and Contract subject to the above noted adjustments.

Upon the completion and acceptance of this Contract by the Board of Acquisition and Contract, as aforesaid, the Commissioner shall proceed with all reasonable diligence to ascertain from actual measurements the whole amount of work done by the Contractor, and also the value of such work under and according to the terms of this Contract, and thereupon make out in writing a final estimate therefor.

After the completion and acceptance as herein above-mentioned, the Commissioner of Public Works shall file with the Commissioner of Finance of the County of Westchester the original verified certificate, claim voucher and the certification required by Section 220-a of the Labor Law, together with a certified copy of the resolution of approval and ratification of the Board of Acquisition and Contract of the said verified certificate and claim voucher and the resolution of acceptance of completion.

IT IS FURTHER UNDERSTOOD AND AGREED by and between the parties to this Contract that the Contractor will accept the unit prices named in the proposal for all additions to or deductions from the original quantities as given in the specifications. It is agreed that the Commissioner will make estimates of the value for the work completed as provided in the specifications and the final estimate will be made accordingly.

SAMPLE

The Contractor further agrees that if at any time before or within thirty days after the whole of the work herein agreed to be performed has been completed and accepted any person or persons claiming to have performed any labor or furnished any material towards the performance and completion of this contract shall file with the proper officials any such notice as is described in the Lien Law, or any other act of the Legislature of the State of New York, the Contractor shall cause such Lien to be discharged of record. Otherwise and in every case and until the Lien is discharge of record the County shall retain, anything herein to the contrary notwithstanding, from the moneys under its control and due or to grow due under this Contract the sum of one hundred fifty (150%) percent of the amount of such Lien, unless otherwise authorized to withhold a larger amount. The Contractor further agrees to pay the County upon demand the costs, including but not limited to attorney's fees, incurred by the County in any action(s) brought to foreclose or otherwise enforce said Lien.

The Contractor covenants and agrees to commence the work embraced in this Contract within Ten [10] calendar days after service upon him, by the Commissioner, of written notice instructing him to begin the work and shall complete the same in all respects within _____ consecutive calendar days computed from the date of such Notice to Commence.

It is further understood and agreed by the parties hereto that the time of completion is of the essence of this Contract.

It is further understood and agreed by the Contractor that before entering upon the performance of this Contract it shall have approved by the County Attorney the Bond required to be furnished by it in the sum of----------
[$] conditioned for the faithful performance of the work.

The Contractor hereby covenants and agrees to observe the plans, specifications and directions of the Commissioner in the doing of the work provided for under this Contract and to furnish the necessary materials and implements required therefore and to remove condemned material and rubbish as provided by plans and specifications and to employ a competent and sufficient force of workmen to complete the work of this improvement within the time specified. Should the Contractor at any time become insolvent, make an assignment for the benefit of creditors, abandon the Work, reduce its working force to a number which, if maintained, would be insufficient, in the sole opinion of the Commissioner, to complete the Work in accordance with the approved progress schedule; sublet, assign or otherwise dispose of this Contract other than as permitted elsewhere herein, refuse or neglect to supply a sufficiency of properly skilled workmen, or of material of the proper quantity or fail in any respect to prosecute the work with promptness and diligence, or fail in any other way in the performance of any of the agreements herein contained; all the foregoing being deemed acts of default, and such default being certified by the Commissioner, the County of Westchester, acting by the Board of Acquisition and Contract, shall be at liberty after five days written notice to the Contractor to provide any such labor or materials, use any and all sums due or to become due to the Contractor under this Contract, to pay for such labor and material, and if the Commissioner shall certify that such default is sufficient ground for such action, the County of Westchester acting by the Board of Acquisition and Contract, shall also be at liberty to terminate the employment of the Contractor for the said work and to enter upon the premises and take possession for the purpose of completing the work included under this Contract of all materials, tools and appliances thereon

SAMPLE

and to employ any other person or persons to finish the work and provide the materials therefore. Upon the Contractor's receipt of a notice from the County the Contractor shall immediately discontinue all further operations under this Contract. In case of such termination, the Contractor shall not be entitled to receive any further payment under this Contract until the said work shall be wholly finished, at which time if the unpaid balance of the amount to be paid under this Contract shall exceed the reasonable value of the work performed and the material furnished or the total costs therefor, whichever is greater, in finishing the work, such excess shall be paid by the County of Westchester to the Contractor, but if such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the County.

The expense incurred by the County and the total costs as herein provided either for furnishing materials or for finishing the work and any damage incurred through such default shall be certified by the Commissioner whose certificate thereof shall be final and conclusive upon the parties and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules.

In case the County shall declare the Contractor in default as to a part of the work only, the Contractor shall immediately discontinue such part, shall continue performing the remainder of the Work in strict conformity with the terms of the Contract.

In completing the whole or any part of the Work under the provisions of this Contract, the Commissioner shall have the power to depart from or change or vary the terms and provisions of this Contract. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Commissioner's certification of the cost of completion referred to above, nor shall it constitute a defense to an action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for his default or partial default.

In addition to termination as provided for above, the County may terminate this Contract for the convenience of the County by written notice to the Contractor from the Commissioner. In such event and upon receipt of such notice the Contractor shall stop work on the date specified in the notice; take such actions as may be necessary to protect and preserve the County's materials and property; cancel all cancelable orders for material and equipment; assign to the County and deliver to the jobsite or any other location designated by the Commissioner any non-cancelable orders for material and equipment that is not capable of use except in the performance of this Contract and which has been specifically fabricated for the sole purpose of this Contract and not incorporated in the Work; and take no action that will increase the amounts payable by the County under this Contract.

In the event the contract is cancelled for the convenience of the County the following provisions shall apply:

(a) For Work completed prior to the notice of termination, the Contractor shall be paid the fair and reasonable value of its work determined by the pro rata portion of the lump sum bid amount based upon the percent completion of the Work as of the date of termination as determined by the Commissioner, plus work completed pursuant to approved change orders, less amounts

SAMPLE

previously paid. For purposes of determining the pro rata portion of the lump sum bid amount to which the Contractor is entitled, the Contractor's approved bid breakdown pursuant to Article 21 of the Information for Bidders shall be considered but shall not be dispositive as to the fair and reasonable value.

(b) For non-cancelable material and equipment that is not capable of use except in the performance of this Contract and which has been specifically fabricated for the sole purpose of this Contract, but not yet incorporated in the Work, the Contractor shall be paid the fair and reasonable value thereof as determined by the Commissioner, but not more than the Contractor's cost for such material and equipment, plus an additional sum of two (2%) percent of such fair and reasonable value.

(c) In the event the County terminates a lump sum Contract for convenience within thirty (30) days after the Contractor has received the Notice of Award from the County, the Contractor shall be paid one (1%) percent of the difference between the total lump sum bid amount and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to (a) and (b).

(d) On all unit price Contracts, or on unit price items in a Contract, the County will pay the Contractor the sum of (e) and (f) below, less all payments previously made pursuant to this Contract:

(e) For all completed units, the unit price stated in the Contract, and

(f) For units that have been ordered but are only partially completed, the Contractor will be paid (i) a pro rata portion of the unit price as stated in the Contract based upon the percent completion of the unit as determined by the Commissioner and (ii) for non-cancelable material and equipment, payment will be made pursuant to (b), above.

(g) The Commissioner's determination(s) hereunder shall be final, binding and conclusive and subject to review only pursuant to Article 78 of the New York Civil Practice Law and Rules.

(h) The County shall not be liable to the Contractor for any payment or claim if the termination for convenience results in a reduction of thirty (30%) percent or less of the original contract price as bid.

On all Contracts or items in a Contract where time and material records are specified as the basis for payment of the Work, the Contractor shall be paid in accordance with Article 29 of the General Clauses, less all payments previously made pursuant to this Contract.

In no event shall any payments made pursuant to a termination for convenience exceed the Contract price for such items, either individually or collectively.

SAMPLE

All payments made pursuant to a termination for convenience shall be in the nature of liquidated damages and shall be accepted by the Contractor in full satisfaction of all claims against the County.

The County may deduct or set off against any sums due and payable arising from a termination for convenience, any claims it may have against the Contractor.

In the event the County terminates the Contractor for default and it is subsequently determined that the Contractor was not in default, said termination shall automatically be converted for all purposes into a termination for convenience.

It is further understood and agreed between the parties hereto that no certificate given or payment made under this Contract, except the final certificate or final payment shall be conclusive evidence of the performance of this Contract either wholly or in part and that no payment shall be construed to be an acceptance of defective work or improper materials. If the Contractor shall fail to replace any defective work or materials, the County may cause such defective materials to be removed and defective work to be replaced and the expense thereof shall be deducted from the amount to be paid the Contractor.

Anything to the contrary in the preceding paragraph notwithstanding, the Contractor is responsible for the repair of defects in materials and workmanship for a period of one year from the date of final acceptance of the work by the Board of Acquisition and Contract, unless a longer term is specified in the specifications.

The Contractor further agrees not to assign, transfer, convey, sublet or otherwise dispose of this Contract, or its right, title or interest in or to the same, or any part hereof without the previous consent in writing of the Board of Acquisition and Contract of the County. Before a Subcontractor shall proceed with any work, the Commissioner must first recommend and the Board of Acquisition and Contract must approve the use of the Subcontractor on this Contract. If a Subcontractor is not approved it may not work on this Contract. The Contractor specifically waives any claim due to the failure or refusal of the Commissioner or the Board of Acquisition and Contract to approve said Subcontractor.

The Contractor agrees to hold himself responsible for any claims made against the County for any infringement of patents by the use of patented articles in the construction and completion of the work or any process connected with the work agreed to be performed under this Contract or of any material used upon the said work, and shall indemnify and save harmless the County for the costs, expenses and damages which the County may be obligated to pay by reason of any infringement of patents used in the construction and completion of the work.

The parties hereto agree that no laborer, workman or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the Contract shall be permitted or required to work more than eight hours in any one calendar day or more than five days in any one week except in cases of extraordinary emergency including fire, flood or danger to life or property. No such person shall be so employed more than eight hours in any day or more than five days in any one week except in such emergency. Time lost in any week because of inclement weather by employees engaged in

SAMPLE

the construction, reconstruction and maintenance of highways outside of the limits of cities and villages may be made up during that week and/or the succeeding three weeks.

The Contractor further agrees to erect and maintain during construction all necessary guards, rails and signals to prevent accidents to persons, vehicles or to the adjoining property and also agrees to use all necessary precautions in blasting and that he will indemnify and save the County of Westchester harmless from all suits and actions of any kind and nature whatsoever from or on account of the construction of said work.

It is further understood and agreed by the parties hereto that should any dispute arise respecting the true construction, interpretation or meaning of the Contract plans, specifications or conditions herein, or the measurements for the payment thereunder, same shall be referred to and decided by the said Commissioner and his decision thereon shall be final and conclusive upon the parties thereto and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules. This provision shall also apply to the true value of and duly authorized extra work or any work permitted by agreement in case any work shall be ordered performed, or any work called for shall be so omitted under and upon the direction of said Commissioner.

The Contractor by the submitting of bids and execution of this Contract hereby covenants and agrees that he has examined the plans, specifications and the site work, as to local conditions, difficulties and accuracy of approximate estimate of quantities and does hereby further covenant and agree that he will not make any claim for damages by reason of any such local conditions, difficulties or variation of approximate estimate of quantities.

The Contractor represents and warrants to the County with the knowledge and expectation that this warranty will be relied upon by the County that it is not now participating and has not at any time participated, either directly or through any substantially owned or affiliated person, firm, partnership or corporation, in an international boycott in violation of the provisions of United States Export Administration Act of 1969, 50 USC 2401 et seq. or the regulations promulgated thereunder.

The Contractor further warrants and represents that it is financially solvent, and sufficiently experienced and competent to perform the work and that the facts provided by it to the County in its bid and supporting documents, and contract documents are true and correct in all respects.

This Contract shall become void and any rights of the Contractor hereunder shall be forfeited if, subsequent to the execution hereof, the Contractor is convicted of a violation of the provision of the United States Export Administration Act of 1969, 50 USC 2401 et seq. as amended or has been found upon the final determination of the United States Commerce Department or any other appropriate agency of the United States or the State of New York to have violated such act or regulations.

If the Contractor, any officer, director, or any party holding a controlling interest (defined as five (5%) percent or more, or in the case of a corporation, any stockholder owning five (5%) percent or more of the outstanding shares) is convicted of a crime (excluding Class B and

SAMPLE

Unclassified Misdemeanors as defined under the New York State Penal Law and their equivalent in any city, state or under Federal law related to the type of services or activities which are the subject matter of this Contract) or if a related or affiliated company, partnership or corporation is convicted of a crime (excluding Class B and Unclassified Misdemeanors as defined above) after this Contract is fully executed, the County shall have the right to terminate this Agreement immediately and without penalty. An "affiliated company" as used herein means any affiliate which is a partnership, corporation, proprietorship, association or other entity (i) in which a 50% or greater ownership interest (as defined below) is directly or indirectly held by the Contractor or any of its management personnel (as defined below) or directors, (ii) which directly or indirectly holds 50% or more of the ownership interest in the Contractor, (iii) in which an aggregate 20% or greater ownership interest is directly or indirectly held by one or more shareholders (or partners or proprietors, in the case of a partnership or proprietorship) which or who in the aggregate hold a 20% or greater ownership interest in the Contractor, or (iv) which, whether by Contract or otherwise, directly or indirectly controls, is controlled by or is under common control with the Contractor. An "ownership interest" means the ownership, whether legally or beneficially, of the stock of or assets employed by a corporation, of a partnership interest in or assets employed by a partnership or of a similar interest in or assets employed by any other entity. "Management personnel" means executive officers and all other persons, whether or not officers or employees, who perform policy-making functions similar to those of executive officers.

The Contractor represents that at the time of execution of this Contract, no individual or entity, as described above, has been convicted of a crime during the five (5) year period preceding the execution of this Contract.

The parties hereto recognize that it is the goal of Westchester County to use its best efforts to encourage, promote and increase participation of business enterprises owned and controlled by persons of color or women (MBE/WBE) in contracts or projects funded by all Departments of the County and to effectively and efficiently monitor such participation. Therefore, the Contractor agrees to complete the MBE/WBE Questionnaire, which is attached hereto as Schedule “A,” in furtherance of this goal and in accordance with Local Law No. 27-1997.

It is recognized and understood by the parties that this Contract is subject to appropriation by the Westchester County Board of Legislators. The County shall have no liability under this Contract beyond the funds, if any, that are appropriated and available for payment of the amounts due under this Contract. Notwithstanding the foregoing, the County will do all things lawfully within its power to obtain, maintain and properly request and pursue funds from which payments under this Contract may be made.

The parties hereto for themselves, their legal representatives, successors and assigns, expressly agree that any legal action or proceeding that may arise out of or relating to this Contract shall be brought and maintained only in the courts of the State of New York (“New York State Court”) located in the County of Westchester. With respect to any action between the County and Contractor in New York State Court, the Contractor hereby expressly waives and relinquishes any rights it may otherwise have (i) to move to dismiss on grounds of forum *non*

SAMPLE

conveniens; (ii) to remove to Federal Court; and (iii) to move for a change of venue to a New York State Court outside of Westchester County.

This Contract and its terms, covenants, obligations, conditions and provisions shall be binding upon all the parties hereto, their legal representatives, successors and assigns.

SAMPLE

This Contract shall not be enforceable until it is signed by all parties and approved by the Office of the County Attorney.

IN WITNESS WHEREOF, the parties hereto have executed this agreement, THE COUNTY OF WESTCHESTER pursuant to law by:

_____ its **Commissioner**

and the CONTRACTOR:

By:_____ its _____
(*Type or Print Name*) (*Title*)

THE COUNTY OF WESTCHESTER:

By:_____
Commissioner

CONTRACTOR:

By:_____
(*Signature*)

ATTEST: *(SEAL)*

By:_____
(*Signature*)

Recommended:

_____
Deputy Commissioner of Public Works

Approved as to form and manner of execution
this _____ day of _____, 200__

_____
County Attorney

SAMPLE

CONTRACTOR'S ACKNOWLEDGMENT
(If Corporation)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came _____ to me known, and known to me to be the _____ of _____, the Corporation described in and which executed the within instrument, who being by me duly sworn did depose and say that the said _____ resides at _____ and that he/she is the _____ of said Corporation and that he/she signed his/her name thereto by order of the Board of Directors of said Corporation and, if operating under any trade name, that the certificate required by the New York State General Business Law Section 130 has been filed with the Secretary of State of the State of New York.

_____
Notary Public

CONTRACTOR'S ACKNOWLEDGMENT
(If Individual)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came _____ to me known, and known to me to be the same person described in and who executed the within instrument and duly acknowledged to me that he/she executed the same for the purpose herein mentioned and, if operating under any trade name, that the certificate required by the New York State General Business Law Section 130 has been filed with the County Clerk of Westchester County.

_____
Notary Public

CONTRACTOR'S ACKNOWLEDGMENT
(If Co-Partnership)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came _____ to me known, and known to me to be a member of the firm of _____ and the person described in, and who executed the within instrument in behalf of said firm, and he/she acknowledged to me that he/she executed the same in behalf of, and as the act of said firm for the purposes herein mentioned and, if operating under any trade name, that the certificate required by the New York State General Business Law Section 130 has been filed with the County Clerk of Westchester County.

_____
Notary Public

SAMPLE

CERTIFICATE OF AUTHORITY

I, _____
(*Officer other than officer signing contract*)

certify that I am _____ of
(*Title*)

the _____
(*Name of Corporation*)

organized and in good standing under the _____
(*Law under which organized*)

named in the foregoing agreement; that _____
(*Person executing agreement*)

who signed said agreement on behalf of the Contractor was, at the time of execution the

_____ of the Corporation; that said agreement was duly
(*Title of such person*)

signed for and on behalf of said Corporation by authority of its Board of Directors, thereunto duly authorized and is in full force and effect at the date hereof.

_____
(*Signature*)

(SEAL)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came _____ to me known, and known to me to be the _____ of _____, the Corporation described in and which executed the above certificate, who being by me duly sworn did depose and say that the said _____ resides at _____ and that he/she is _____ of said Corporation and knows the Corporate Seal of the said Corporation; that the seal affixed to the above certificate is such Corporate Seal and was so affixed by order of the Board of Directors of said Corporation, and that he/she signed his/her name thereto by like order.

_____
Notary Public

SAMPLE

CORPORATE ACKNOWLEDGEMENT
(Sole Officer)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came

_____ to me known, and known to me to be the
(*Name*)

_____ of _____,
(*Title*) (*Name of Corporation*)

the Corporation described in and which executed the within instrument, who being by me duly sworn did depose and say that he/she signed the within instrument, on behalf of said Corporation, in his/her capacity as _____ and Sole Officer and
(*Title*)

director of said Corporation and that he/she owns all the issued and outstanding capital stock of said Corporation and knows the Corporate Seal of the said Corporation; and, if operating under any trade name, that the certificate required by New York State General Business Law Section 130 has been filed with the Secretary of State of the State of New York.

_____
Notary Public

SAMPLE

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we

(hereinafter called the "Principal"), and the _____

_____

a Corporation created and existing under the laws of the State of _____

and having its principal office at _____
in the City of _____ (hereinafter called the "Surety"), are held and firmly bound unto The County of Westchester (hereinafter called the "Obligee") in the penal sum of----------**DOLLARS**---------**AND**----------**/100**----------**[$]**

lawful money of the United States of America, for the payment of which, well and truly to be made, the said Principal binds itself, (himself, themselves) and its (his, their) successors and assigns, and the said Surety binds itself and its successors and assigns, all jointly and severally, firmly by these presents. Said penal sum shall apply separately and independently, in its total amount, to the payment provision and the performance provision of this Bond shall not reduce or limit the right of the Obligee to recover under the other said provision.

Signed, sealed and dated this _____ day of _____, 200__.

WHEREAS, said Principal has entered into a certain written contract with said Obligee, dated this _____ day of _____, 200__, (hereinafter called the "Contract")

For ----**CONTRACT #** _____a copy of which Contract is hereto annexed and hereby made a part of this bond as if herein set forth in full.

SAMPLE

NOW THEREFORE, THE CONDITIONS OF THE ABOVE OBLIGATIONS ARE SUCH THAT, if the said Principal, and its (his, their) successors or assigns, or any or either of them shall,

(1) well and truly and in good, sufficient and workmanlike manner, perform or cause to be performed such Contract, and any amendment or extension of or addition thereto, and each and every of the covenants, promises, agreements and provisions therein stipulated and contained to be performed by said Principal, and complete the same within the period therein mentioned, and in each and every respect, comply with the conditions therein mentioned to be complied with by said Principal, and fully indemnify and save harmless the Obligee from all costs and damages which it may suffer by reason of failure so to do and fully reimburse and repay the Obligee all outlay and expense which it may incur in making good any such default, and

(2) also pay or cause to be paid the wages and compensation for labor performed and services rendered of all persons engaged in the prosecution of the work provided for therein, whether such persons by agents, servants or employees of the Principal, and of its (his, their) successors or assigns, or any Subcontractor or of any assignee thereof, including all persons so engaged who perform the work of laborers or of mechanics regardless of any contractual relationship between the Principal, or its (his, their) successors or assigns, or any Subcontractor or any designee thereof, and such laborers or mechanics, but not including office employees not regularly stationed at the site of the work, and further, shall pay or cause to be paid all lawful claims of Subcontractors and of materialmen and other third persons out of or in connection with said Contract and the work, labor, services, supplies and material furnished in and about the performance and completion thereof, then these obligations shall be null and void, otherwise they shall remain in full force and effect.

PROVIDED, however, that this bond is subject to the following additional conditions and limitations:

(a) All persons who have performed labor or rendered services, as aforesaid, all Subcontractors, and all persons, firms, corporations, including materialmen and third persons, as aforesaid, furnishing work, labor, services, supplies and material under or in connection with said Contract or in or about the performance and completion thereof, shall have a direct right of action (subject to the prior right of the Obligee under any claim which it may assert against the Principal or its (his, their) successors and assigns, and/or the Surety and its successors and assigns) against the Principal and its (his, their) successors and assigns on this bond, which right of action shall be asserted in proceedings instituted in the State in which such work, labor, services, supplies or material was performed, rendered or furnished or where work, labor, services, supplies or material has been performed, rendered or furnished, as aforesaid, in more than one State, than in any such State. Insofar as permitted by the laws of such State, said right of action shall be asserted in a proceeding instituted in the name of Obligee to the use and benefit of the person, firm or corporation instituting such action and of all other persons, firms and corporations having claims hereunder, and any other person, firm or corporation having a claim hereunder shall have the

SAMPLE

right to be made a party to such proceedings (but not later than twelve months after the performance of said Contract and final settlement thereof) and to have such claim adjudicated in such action and judgment rendered thereon. Prior to the institution of such a proceeding by a person, firm or corporation in the name of the Obligee, as aforesaid, such person, firm of corporation shall furnish the Obligee with a Bond of Indemnity for costs, which Bond shall be in an amount satisfactory to the Obligee.

(b) The Surety or its successors or assigns shall not be liable hereunder for any damages or compensation recoverable under any worker's compensation or employer's liability statute.

(c) In no event shall the Surety or its successors or assigns be liable under either the foregoing clause (1) or the foregoing clause (2) for a greater sum than the penalty of this Bond provided; however, that said penalty is separately applicable, in its total amount to each of the foregoing clauses (1) and (2), or subject to any suit, action or proceeding hereon that is instituted by any person, firm or corporation under the provisions of the above section (a) later than twelve months after the complete performance of said Contract and final settlement thereof.

The Principal, for itself (himself, themselves) and its (his, their) successors and assigns, and the Surety, for itself and its successors and assigns, do hereby expressly waive any objections that might be interposed as to the right of the Obligee to require a Bond containing the foregoing provisions, and they do hereby further expressly waive any defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including Subcontractors, materialmen, and third persons, for work, labor, services, supplies or material performed, rendered or furnished as aforesaid, upon the ground that there is no law authorizing the said Obligee to require the foregoing provision to be placed in this Bond.

And Surety, for value received, for itself and its successors and assigns, hereby stipulates and agrees that the obligations of said Surety and of its successors and assigns and this Bond shall in no way be impaired or affected by an extension of time, modification, omission, addition or change in or to the said Contract or the work to be performed thereunder, or by any payment thereunder, before the time required therein, or by any waiver of any provision thereof, or by an assignment, subletting or other transfer thereof, or of any part thereof, or of any work to be performed, or of any moneys due or to become due thereunder; and the said Surety, for itself and its successors and assigns, does hereby waive notice of any and all of such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts and transfers, and hereby stipulates and agrees that any and all things done and omitted to be done by and in relation to (executors, administrators), successors, assigns, Subcontractors, and other transferees, shall have the same effect as to said Surety and its successors and assigns, as though done or omitted to be done by and in relation to said Principal.

And Surety, for value received, hereby stipulates and agrees, if requested to do so by Obligee, to fully perform and complete the work to be performed under the Contract, pursuant to the terms, conditions and covenants thereof, if for any cause, the Principal fails or neglects to so

SAMPLE

fully perform and complete such Work. The Surety further agrees to commence such Work of Completion within twenty-five (25) calendar days after written notice thereof from the Obligee, and to complete such Work within twenty-five (25) calendar days from the expiration of the time allowed the Principal in the Contract for the completion of such Work.

WITNESSETH our hands and seals this _____ day of _____, 200__.

PRINCIPAL:

By:_____
(*Signature*)

(SEAL)

ATTEST:

_____

_____
(*Surety*)

By:_____
(*Signature*)

(SEAL)

ATTEST:

_____

SAMPLE

If the Contractor (Principal) is a partnership, the Bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a Corporation, the Bond should be signed in its correct corporate name by a duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the Bond corresponding to the number of counterparts of the Contract.

Each executed Bond should be accompanied by:

(a) appropriate acknowledgments of the respective parties;

(b) appropriate duly certified copy of Power of Attorney or other Certificate of Authority where Bond is executed by agent, officer or other representative of Principal or Surety;

(c) a duly certified extract from By-laws or resolutions of Surety under which Power of Attorney or other Certificate of Authority of its agent, officer or representative was issued, and

(d) duly certified copy of latest published financial statement of assets and liabilities of Surety.

SAMPLE

CONTRACTOR'S ACKNOWLEDGMENT
(If Corporation)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came _____ to me known, and known to me to be the _____ of _____, the Corporation described in and which executed the within instrument, who being by me duly sworn did depose and say that the said _____ resides at _____ and that he/she is the _____ of said Corporation and knows the Corporate Seal of the said Corporation; that the seal affixed to the within instrument is such Corporate Seal and that it was so affixed by order of the Board of Directors of said Corporation and that he/she signed his/her name thereto by like order.

_____
Notary Public

CONTRACTOR'S ACKNOWLEDGMENT
(If Individual)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came _____ to me known, and known to me to be the same person described in and who executed the within instrument and he/she duly acknowledged to me that he/she executed the same for the purpose herein mentioned.

_____
Notary Public

CONTRACTOR'S ACKNOWLEDGMENT
(If Co-Partnership)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came _____ to me known, and known to me to be a member of the firm of _____ and the person described in, and who executed the within instrument in behalf of said firm, and acknowledged to me that he/she executed the same in behalf of, and as the act of said firm for the purposes herein mentioned.

_____
Notary Public

SAMPLE

ACKNOWLEDGMENT BY SURETY COMPANY
(Signed by One Authorized Person)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 200__, before me personally came

_____ to me known, and known to me to be the
(*Name*)

_____ of _____,
(*Title*) (*Name of Corporation*)

the Corporation described in and which executed the within instrument, who being by me duly sworn did depose and say that he/she resides at _____

_____ and that he/she is the _____ of said Corporation
(*Title*)

and knows the Corporate Seal of the said Corporation; that the seal affixed to the within instrument is such Corporate Seal and so affixed by order of the Board of Directors of said Corporation and that he/she signed his/her name thereto by like order; and that the said Corporation has received from the Superintendent of Insurance of the State of New York a Certificate of Solvency, and of its sufficiency as Surety or Guarantor, pursuant to Section 327 of the Insurance Law of the State of New York as amended, and that such Certificate has not been revoked.

_____
Notary Public

SAMPLE

SCHEDULE OF HOURLY RATES

AND SUPPLEMENTS

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

Kathy Hochul, Governor

Roberta Reardon, Commissioner

Westchester County DPWT

Yolanda Spraggins, Secretary II
148 Martine Ave. RM. 518
White Plains NY 10601

Schedule Year	2023 through 2024
Date Requested	03/04/2024
PRC#	2024002636

Location	New Rochelle
Project ID#	20-517
Project Type	erect a temp. bridge, traffic control. Bridge rehab. Steel strengthening. control house LL reconfig. and electrical, submarine cable, barriers/warnings, various mech and elec upgrades. sewer line.

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

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

The schedule is effective from July 2023 through June 2024. 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 12226

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

Introduction

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

Responsibilities of the Department of Jurisdiction

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

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

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

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

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

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

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

Westchester County DPWT

Yolanda Spraggins, Secretary II
148 Martine Ave. RM. 518
White Plains NY 10601

Schedule Year 2023 through 2024
Date Requested 03/04/2024
PRC# 2024002636

Location New Rochelle
Project ID# 20-517
Project Type erect a temp. bridge, traffic control. Bridge rehab. Steel strengthening. control house LL reconfig. and electrical, submarine cable, barriers/warnings, various mech and elec upgrades. sewer line.

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.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is $3 million in Bronx, Kings, New York, Queens and, Richmond counties; $1.5 million in Nassau, Suffolk and Westchester counties; and $500,000 in all other counties.

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

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

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

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

Contractors must pay subcontractors within a 7 days period.

(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.

Payrolls and Payroll Records

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

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

Paid Holidays

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

Overtime

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

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

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

Supplemental Benefits

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

Effective Dates

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

Apprentice Training Ratios

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

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

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

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

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

New York State Department of Labor
Bureau of Public Work
State Office Campus, Bldg. 12
Albany, NY 12226

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

Westchester County General Construction

Boilermaker — 03/01/2024

JOB DESCRIPTION Boilermaker **DISTRICT** 4

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

WAGES
Per Hour:

	07/01/2023	01/01/2024
Boilermaker	$ 65.88	$ 67.38
Repairs & Renovations	65.88	67.38

Repairs & Renovation: Includes Repairing, Renovating replacement of parts to an existing unit(s).

SUPPLEMENTAL BENEFITS
Per Hour:

Boilermaker	33.5% of hourly Wage Paid	33.5% of Hourly Wage Paid
Repair $ Renovations	+ $ 26.49	+ $26.85

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

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

OVERTIME PAY
See (*B, O, **U) on OVERTIME PAGE
Note:* Includes 9th & 10th hours, double for 11th or more.
** Labor Day ONLY, if worked.

Repairs & Renovation see (B,E,Q) on OT Page

HOLIDAY
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 12, 15, 25, 26, 29) on HOLIDAY PAGE

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

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

Supplemental Benefits Per Hour:

Apprentice(s)	33.5% of Hourly Wage Paid Plus Amount Below	33.5% of Hourly Wage Paid Plus Amount Below
1st Term	$ 20.12	$ 20.36
2nd Term	21.03	21.28
3rd Term	21.95	22.22
4th Term	22.83	23.12
5th Term	23.76	24.07
6th Term	24.67	25.00
7th Term	25.58	25.93

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

4-5

Carpenter — 03/01/2024

JOB DESCRIPTION Carpenter **DISTRICT** 8

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

WAGES
Per hour: 07/01/2023

Piledriver	$ 59.16 + 9.79*
Dockbuilder	$ 59.16 + 9.79*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS
Per hour:

Journeyworker	$ 45.34

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

HOLIDAY
Paid: See (1) on HOLIDAY PAGE.

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

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

REGISTERED APPRENTICES
Wages per hour
(1)year terms:

1st	2nd	3rd	4th
$25.60 + 5.30*	$31.20 + 5.30*	$39.58 + 5.30*	$47.97 + 5.30*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All Terms: $ 31.83

8-1556 Db

Carpenter — 03/01/2024

JOB DESCRIPTION Carpenter **DISTRICT** 8

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

WAGES
Per hour: 07/01/2023

Carpet/Resilient Floor Coverer	$ 55.05 + 8.25*

*This portion is not subject to overtime premiums

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

SUPPLEMENTAL BENEFITS
Per hour:
$ 39.45

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

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

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

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

1st	2nd	3rd	4th
$ 25.20	$ 28.20	$ 32.45	$ 40.33

+ 1.85*	+ 2.35*	+ 2.85*	+ 3.85*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

1st	2nd	3rd	4th
$ 15.22	$ 16.22	$ 19.32	$ 20.32

8-2287

Carpenter — 03/01/2024

JOB DESCRIPTION Carpenter **DISTRICT** 8

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

WAGES
Per Hour: 07/01/2023

Marine Construction:

Marine Diver	$ 74.03
	+ 9.79*
Marine Tender	$ 53.57
	+ 9.79*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS
Per Hour:

Journeyworker	$ 45.34

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

HOLIDAY
Paid: See (18, 19) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 13, 16, 18, 19, 25) on HOLIDAY PAGE

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

1st year	$ 25.60
	+ 5.30*
2nd year	31.20
	+ 5.30*
3rd year	39.58
	+ 5.30*
4th year	47.97
	+ 5.05*

*This portion is not subject to overtime premiums

Supplemental Benefits
Per Hour:

All terms	$ 31.83

8-1456MC

Carpenter — 03/01/2024

JOB DESCRIPTION Carpenter **DISTRICT** 8

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

WAGES
Per hour: 07/01/2023

Building
Millwright $ 58.70
+ 12.62*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS
Per hour:

Millwright $ 44.31

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

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

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

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

1st.	2nd.	3rd.	4th.
$31.74	$37.19	$42.64	$53.54
+ 6.75*	+ 7.92*	+ 9.09*	+ 11.43*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:
One (1) year terms:

1st.	2nd.	3rd.	4th.
$29.81	$32.34	$35.52	$39.94

8-740.1

Carpenter 03/01/2024

JOB DESCRIPTION Carpenter **DISTRICT** 8

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

WAGES
Per Hour:

07/01/2023

Timberman $ 54.05
+ 10.26*

*This portion not subject to overtime premiums

SUPPLEMENTAL BENEFITS
Per Hour:

07/01/2023

$ 44.55

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

HOLIDAY
Paid: See (1) on HOLIDAY PAGE.

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

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

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

1st	2nd	3rd	4th
$23.42	$28.53	$36.18	$43.84
+ 5.55*	+ 5.55*	+ 5.55*	+ 5.55*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:
All terms $ 31.54

8-1556 Tm

Carpenter 03/01/2024

JOB DESCRIPTION Carpenter **DISTRICT** 8

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

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

WAGES
Per hour: 07/01/2023

Core Drilling:
Driller $ 43.88
+ 2.50*

Driller Helper $ 34.47
+ 2.50*

Note: Hazardous Waste Pay Differential:
For Level C, an additional 15% above wage rate per hour
For Level B, an additional 15% above wage rate per hour
For Level A, an additional 15% above wage rate per hour
Note: When required to work on water: an additional $ 3.00 per hour.

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS
Per hour:

Driller and Helper $ 28.85

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

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

8-1536-CoreDriller

Carpenter - Building / Heavy&Highway 03/01/2024

JOB DESCRIPTION Carpenter - Building / Heavy&Highway **DISTRICT** 11

ENTIRE COUNTIES
Putnam, Rockland, Westchester

WAGES
WAGES:(per hour)
Applies to CAPRENTER BUILDING/HEAVY & HIGHWAY/TUNNEL:

	07/01/2023	07/01/2024 Additional	07/01/2025 Additional	07/01/2026 Additional
Base Wage	$ 39.80 +$6.71*	$ 1.25**	$ 1.25**	$ 1.25**

*For all hours paid straight or premium.
**To be allocated at a later date.

SHIFT DIFFERENTIAL: When it is mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen percent (15%) of wage plus applicable benefits.

SUPPLEMENTAL BENEFITS
Per hour:

Journeyworker $ 33.22

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

HOLIDAY
BUILDING:
Paid: See (1) on HOLIDAY PAGE.
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE.
- Holidays that fall on Sunday will be observed Monday.

HEAVY&HIGHWAY/TUNNEL:
Paid: See (5, 6, 25) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE
- Holidays that fall on Sunday will be observed Monday
- Must be employed during the five (5) work days immediately preceding a holiday or during the five (5) work days following the paid holiday to receive holiday pay
- If Employee is entitled to a paid holiday, the Employee is paid the Holiday wage and supplemental benefits whether they work or not. If Employee works the Holiday, the Employee will receive holiday pay (including supplemental benefits), plus the applicable premium wage for working the Holiday. If Employee works in excess of 8 hours on Holiday, then benefits will be paid for any hours in excess of 8 hours.

REGISTERED APPRENTICES
1 year terms at the following wage rates:

1st	2nd	3rd	4th	5th
$ 19.90	$ 23.88	$ 25.87	$ 27.86	$ 31.84
+3.58*	+3.58*	+3.58*	+3.58*	+3.58*

*For all hours paid straight or premium

SUPPLEMENTAL BENEFITS per hour:

All terms $ 16.27

11-279.1B/HH

Electrician — 03/01/2024

JOB DESCRIPTION Electrician **DISTRICT** 9

ENTIRE COUNTIES
Bronx, Kings, New York, Queens, Richmond, Westchester

WAGES

Per hour:	07/01/2023	03/07/2024
Service Technician	$ 36.40	$ 37.40

Service and Maintenance on Alarm and Security Systems.

Maintenance, repair and /or replacement of defective (or damaged) equipment on, but not limited to, Burglar - Fire - Security - CCTV - Card Access - Life Safety Systems and associated devices. (Whether by service contract of T&M by customer request.)

SUPPLEMENTAL BENEFITS

Per hour:		
Journeyworker:	$ 21.07	$ 21.85

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

HOLIDAY
Paid: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

9-3H

Electrician — 03/01/2024

JOB DESCRIPTION Electrician **DISTRICT** 8

ENTIRE COUNTIES
Westchester

WAGES

Per hour:	07/01/2023	04/18/2024	04/17/2025
*Electrician/A-Technician	$ 55.75	$ 56.75	$ 58.75

Teledata	55.75	56.75	58.75

*All new installations of wiring, conduit, junction boxes and light fixtures for projects with a base bid of more than $325,000. For projects with a base bid of $325,000 or less, see Maintenance and Repair rates.

Note: On a job where employees are required to work on bridges over navigable waters, transmission towers, light poles, bosun chairs, swinging scaffolds , etc. 40 feet or more above the water or ground or under compressed air, or tunnel projects under construction or where assisted breathing apparatus is required, they will be paid at the rate of time and one-half for such work except on normal pole line or building construction work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	$ 56.26	$59.39	$61.09

OVERTIME PAY

See (A, G, *J, P) on OVERTIME PAGE

*NOTE: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

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

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

	07/01/2023	04/18/2024	04/17/2025
1st term	$ 16.00	$16.00	$16.00
2nd term	17.00	17.00	17.00
3rd term	19.00	19.00	19.00
4th term	21.00	21.00	21.00
MIJ 1-12 months	26.50	26.50	26.50
MIJ 13-18 months	30.00	30.00	30.00

Supplemental Benefits per hour:

	07/01/2023	04/18/2024	04/17/2025
1st term	$ 11.63	$ 12.40	$ 12.72
2nd term	14.30	15.07	15.89
3rd term	15.62	16.40	17.23
4th term	16.95	17.73	18.57
MIJ 1-12 months	13.92	15.72	15.89
MIJ 13-18 months	14.33	16.17	16.29

8-3/W

Electrician — 03/01/2024

JOB DESCRIPTION Electrician **DISTRICT** 8

ENTIRE COUNTIES

Westchester

WAGES

Per hour

	07/01/2023	04/18/2024	04/17/2025
Electrician -M	$ 30.00	$ 30.00	$ 30.00
H - Telephone	30.00	30.00	30.00

All work with a base bid amount of $325,000 or less. Including repairs and /or replacement of defective electrical and teledata equipment, all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls, and washing and cleaning of foregoing fixtures.

*If the project exceeds $375,000 due to changes in the scope of work, an Electrician/A Technician must be part of the labor ratio.

SUPPLEMENTAL BENEFITS

	07/01/2023	04/18/2024	04/17/2025
Electrician & H - Telephone	$ 14.33	$ 16.17	$ 16.29

OVERTIME PAY

See (B, G, *J, P) on OVERTIME PAGE

*Note: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

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

Elevator Constructor 03/01/2024

JOB DESCRIPTION Elevator Constructor **DISTRICT** 4

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

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

WAGES
Per hour:

	07/01/2023
Elevator Constructor	$ 77.49
Modernization & Service/Repair	$ 60.89

NOTE - The 'Employer Registration' (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30,2023 will expire within the granted time frame.

For Pre-Registered Projects Four (4), Ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS
Per Hour:

Elevator Constructor	$ 45.574
Modernization & Service/Repairs	44.412

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

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

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

REGISTERED APPRENTICES
WAGES PER HOUR:
*Note:1st, 2nd, 3rd Terms are based on Average wage of Constructor & Modernization.
Terms 4 thru 9 Based on Journeyman's wage of classification Working in.

6 MONTH TERMS:

1st Term*	2nd & 3rd Term*	4th & 5th Term	6th & 7th Term	8th & 9th Term
50%	50%	55%	65%	75%

SUPPLEMENTAL BENEFITS

Elevator Constructor	
1st Term	$ 0.00
2nd & 3rd Term	36.024
4th & 5th Term	36.943
6th & 7th Term	38.448
8th & 9th Term	39.953

Modernization & Service/Repair	
1st Term	$ 0.00
2nd & 3rd Term	35.694
4th & 5th Term	36.525
6th & 7th Term	37.948
8th & 9th Term	39.38

Elevator Constructor — 03/01/2024

JOB DESCRIPTION Elevator Constructor **DISTRICT** 1

ENTIRE COUNTIES
Columbia, Dutchess, Greene, Orange, Putnam, Sullivan, Ulster

PARTIAL COUNTIES
Delaware: Towns of Andes, Bovina, Colchester, Davenport, Delhi, Harpersfield, Hemdon, Kortright, Meredith, Middletown, Roxbury, Hancock & Stamford
Rockland: Only the Township of Stony Point.
Westchester: Only the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per Hour	07/01/2023	01/01/2024
Mechanic	$ 67.35	$ 70.15
Helper	70% of Mechanic Wage Rate	70% of Mechanic Wage Rate

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30, 2023 will expire within the granted time frame.

For Pre-Registered Projects Four (4), Ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS
Per hour

	07/01/2023	01/01/2024
Journeyperson/Helper	$ 37.335*	$ 37.885*

(*)Plus 6% of regular hourly if less than 5 years of service. Plus 8% of regular hourly rate if more than 5 years of service.

OVERTIME PAY
See (D, O) on OVERTIME PAGE

HOLIDAY
Paid: See (5, 6, 15, 16) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE
Note: When a paid holiday falls on Saturday, it shall be observed on Friday. When a paid holiday falls on Sunday, it shall be observed on Monday.

REGISTERED APPRENTICES
Wages per hour:

0-6 mo*	6-12 mo	2nd yr	3rd yr	4th yr
50 %	55 %	65 %	70 %	80 %

(*)Plus 6% of the hourly rate, no additional supplemental benefits.

Supplemental Benefits per hour worked:

Same as Journeyperson/Helper

1-138

Glazier — 03/01/2024

JOB DESCRIPTION Glazier **DISTRICT** 8

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

WAGES

Per hour:	7/01/2023
Glazier & Glass Tinting	$ 61.64
*Scaffolding	65.64
Window Film	
**Repair & Maintenance	30.76

*Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 30' or more, but not pipe scaffolding.

**Repair & Maintenance- All repair & maintenance work on a particular building whenever performed, where the total cumulative Repair & Maintenance contract value is under $184,000.

SUPPLEMENTAL BENEFITS

Per hour:	7/01/2023
Glazier & Glass Tinting	$ 40.20
Window Film Repair & Maintenance	23.19

OVERTIME PAY
See (B, E, Q, V) on OVERTIME PAGE
For 'Repair & Maintenance' see (B, B2, I, S) on overtime page.

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

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

	7/01/2023
1st term	$ 21.93
2nd term	30.05
3rd term	39.95
4th term	48.97

Supplemental Benefits:
(Per hour)

1st term	$ 18.25
2nd term	25.97
3rd term	31.27
4th term	34.32

8-1087 (DC9 NYC)

Insulator - Heat & Frost — 03/01/2024

JOB DESCRIPTION Insulator - Heat & Frost **DISTRICT** 8

ENTIRE COUNTIES
Dutchess, Orange, Putnam, Rockland, Westchester

WAGES

Per hour:	07/01/2023	06/01/2024
Insulator	$ 59.25	+ $ 2.50
Discomfort & Additional Training**	62.31	+ $ 2.50
Fire Stop Work*	31.77	+ $ 2.50

* Applies on all exclusive Fire Stop Work (When contract is for Fire Stop work only). No apprentices on these contracts only.

**Applies to work requiring; garb or equipment worn against the body not customarily worn by insulators; psychological evaluation ;special training, including but not limited to "Yellow Badge" radiation training

Note: Additional $0.50 per hour for work 30 feet or more above floor or ground level.

SUPPLEMENTAL BENEFITS
Per hour:

Journeyworker	$ 37.35

Discomfort & Additional Training	39.39
Fire Stop Work:	
Journeyworker	19.03

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

HOLIDAY
Paid: See (1) on HOLIDAY PAGE
Note: Last working day preceding Christmas and New Years day, workers shall work no later than 12:00 noon and shall receive 8 hrs pay.

Overtime: See (2*, 4, 6, 16, 25) on HOLIDAY PAGE.
*Note: Labor Day triple time if worked.

REGISTERED APPRENTICES
(1) year terms:

Insulator Apprentices:

1st	2nd	3rd	4th
$ 31.77	$ 37.26	$ 42.76	$ 48.26

Discomfort & Additional Training Apprentices:

1st	2nd	3rd	4th
$ 33.30	$ 39.09	$ 44.90	$ 50.71

Supplemental Benefits paid per hour:

Insulator Apprentices:

1st term	$ 19.03
2nd term	22.69
3rd term	26.36
4th term	30.03

Discomfort & Additional Training Apprentices:

1st term	$ 20.06
2nd term	23.92
3rd term	27.78
4th term	31.66

8-91

Ironworker — 03/01/2024

JOB DESCRIPTION Ironworker **DISTRICT** 9

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

WAGES

Per Hour:	07/01/2023	01/01/2024 Additional
Stone Derrickmen Rigger	$ 72.90	+ $ 1.64
Stone Handset Derrickman	70.47	+ $ 1.11

SUPPLEMENTAL BENEFITS
Per hour:

Stone Derrickmen Rigger	$ 43.10
Stone Handset Derrickman	42.84

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

HOLIDAY
Paid: See (18) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 25) on HOLIDAY PAGE
Work stops at schedule lunch break with full day's pay.

REGISTERED APPRENTICES
Wage per hour:

Stone Derrickmen Rigger:

	1st	2nd	3rd	4th
07/01/2023	$ 35.90	$ 51.53	$ 57.32	$ 63.11

Supplemental Benefits:
Per hour:

07/01/2023	22.11	32.58	32.58	32.58

Stone Handset:

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

	1st	2nd	3rd	4th
07/01/2023	34.56	49.75	55.33	60.90

Supplemental Benefits:
Per hour:

07/01/2023	22.10	32.46	32.46	32.46

9-197D/R

Ironworker — 03/01/2024

JOB DESCRIPTION Ironworker **DISTRICT** 4

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

WAGES
Per Hour:

	07/01/2023
Ornamental	$ 46.90
Chain Link Fence	46.90
Guide Rail	46.90

SUPPLEMENTAL BENEFITS
Per hour:
Journeyworker: $ 63.04

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

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

REGISTERED APPRENTICES
Apprentices Hired after 9/1/18:
1 year terms

	07/01/2023
1st Term	$ 21.13
2nd Term	24.77
3rd Term	28.40
4th Term	32.06

Supplemental Benefits per hour:

1st Term	$ 17.90
2nd Term	19.15
3rd Term	20.41
4th Term	21.67

4-580-Or

Ironworker — 03/01/2024

JOB DESCRIPTION Ironworker **DISTRICT** 4

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

WAGES
PER HOUR:

07/01/2023	01/01/2024	07/01/2024

Ironworker:			Additional
Structural Bridges Machinery	$ 57.20	$ 57.70	$ 1.75/Hr.*

(*)To be allocated at a later date.

SUPPLEMENTAL BENEFITS
PER HOUR PAID:

Journeyman	$ 87.35	$ 88.60

OVERTIME PAY
See (B, B1, Q, *V) on OVERTIME PAGE
*NOTE: Benefits are calculated for every hour paid

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

REGISTERED APPRENTICES
WAGES PER HOUR:

6 month terms at the following rate:

1st	$ 29.73	$ 29.98
2nd	30.33	30.58
3rd - 6th	30.94	31.19

Supplemental Benefits
PER HOUR PAID:

All Terms	$ 60.69	$ 61.59

4-40/361-Str

Ironworker 03/01/2024

JOB DESCRIPTION Ironworker **DISTRICT** 4

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

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

WAGES
Per hour: 07/01/2023

Reinforcing & Metal Lathing	$ 56.95
"Base" Wage	$ 55.20 plus $ 1.75

"Base" Wage is used to calculate overtime hours only.

SUPPLEMENTAL BENEFITS
Per hour:

Reinforcing & Metal Lathing	$ 42.72

OVERTIME PAY
See (B, E, Q, *X) on OVERTIME PAGE
*Only $23.50 per Hour for non worked hours

Supplemental Benefit Premiums for Overtime Hours worked:

Time & One Half	$ 49.47
Double Time	$ 56.22

HOLIDAY
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 11, 13, *18, **19, 25) on HOLIDAY PAGE
*Note: Work performed after first 4 Hours.

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

1st term	2nd term	3rd term	4th Term
Wage Per Hour:			
$ 22.55	$ 28.38	$ 34.68	$ 37.18
"Base" Wage			
$ 21.00	$ 26.80	$ 33.10	$ 35.60
plus $1.55	plus $1.58	plus $1.58	plus $1.58

"Base" Wage is used to calculate overtime hours ONLY.

SUPPLEMENTAL BENIFITS
Per Hour:

1st term	2nd term	3rd term	4th Term
$ 18.17	$ 21.34	$ 22.00	$ 22.50

4-46Reinf

Laborer - Building — 03/01/2024

JOB DESCRIPTION Laborer - Building **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Westchester

WAGES

Per hour	07/01/2023	05/01/2024
Laborer	$ 40.05 plus $5.45**	+ $ 2.00
Laborer - Asbestos & Hazardous Materials Removal	$ 44.50*	+ $ 2.00

* Abatement/Removal of:
- Lead based or lead containing paint on materials to be repainted is classified as Painter.
- Asbestos containing roofs and roofing material is classified as Roofer.

** This portion is not subject to overtime premium.

NOTE: Upgrade/Material condition work plan for work performed during non-outage under a wage formula of 90% wage/100% fringe benefits at nuclear power plants.

SUPPLEMENTAL BENEFITS

Per hour:	07/01/2023
Journeyworker	$ 30.50

OVERTIME PAY
See (B, E, E2, Q, *V) on OVERTIME PAGE
*Note: For Sundays and Holidays worked benefits are at the same premium as wages.

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

REGISTERED APPRENTICES
LABORER ONLY
Hourly terms at the following wage:

Level A	Level B	Level C	Level D
0-1000	1001-2000	2001-3000	3001-4000
$ 28.08	$ 31.90	$ 35.72	$ 39.54

Supplemental Benefits per hour:

Apprentices	
All terms	$ 23.20

8-235/B

Laborer - Heavy&Highway **03/01/2024**

JOB DESCRIPTION Laborer - Heavy&Highway **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Westchester

WAGES
PUTNAM: APPLIES TO ALL HEAVY & HIGHWAY WORK EXCLUDING HIGHWAYS, STREETS, AND BRIDGES

GROUP I: Blaster, Quarry Master, Curbs/Asphalt Screedman, Pipe Jacking and Boring Operations Operator, Qualified Dead Condition Pipe Fuser (B Mechanic)

GROUP II: Burner, Drillers(jumbo, joy, wagon, air track, hydraulic), Drill Operator, Self Contained Rotary Drill, Curbs, Raker, Bar Person, Concrete Finisher.

GROUP III: Pavement Breakers, Jeeper Operator, Jack Hammer, Pneumatic Tools (all), Gas Driller, Guniting, Railroad Spike Puller, Pipelayer, Chain Saw, Deck winches on scows, Power Buggy Operator, Power Wheelbarrow Operator, Bar Person Helper, Compressed Airlance, Water Jet Lance.

GROUP IV: Concrete Laborers, Asph. Worker, Rock Scaler, Vibrator Oper., Bit Grinder, Air Tamper, Pumps, Epoxy (adhesives, fillers and troweled on), Barco Rammer, Concrete Grinder, Crack Router Operator, Guide Rail-digging holes and placing concrete and demolition when not to be replaced, distribution of materials and tightening of bolts.

GROUP V: Drillers Helpers, Common Laborer, Mason Tenders, Signal Person, Pit Person, Truck Spotter, Powder Person, Landscape/Nursery Person, Dump Person, Temp. Heat.

GROUP VIA: Asbestos/Toxic Waste Laborer-All removal (Roads, Tunnels, Landfills, etc.) Confined space laborer, Bio-remediation, Phyto-remediation, Lead or Hazardous material, Abatement Laborer.

Wages:(per hour)	07/01/2023
GROUP I	$ 49.55*
GROUP II	48.20*
GROUP III	47.80*
GROUP IV	47.45*
GROUP V	47.10*
GROUP VIA	49.10*
Operator Qualified	
Gas Mechanic(A Mech)	59.55*
Flagperson	40.75*

*NOTE: To calculate overtime premiums, deduct $0.10 from above wages

SHIFT WORK: A shift premium will be paid on Public Work contracts for off-shift or irregular shift work when mandated by the NYS D.O.T. or other Governmental Agency contracts. Employees shall receive an additional 15% per hour above current rate for all regular and irregular shift work. Premium pay shall be calculated using the 15% per hour differential as base rate.

SUPPLEMENTAL BENEFITS
Per hour:
Journeyworker:
First 40 Hours
Per Hour $ 26.60
Over 40 Hours
Per Hour 19.85

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

HOLIDAY
Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
NOTE: For Holiday Overtime: 5, 6 - Code 'S' applies
For Holiday Overtime: 8, 15, 25, 26 - Code 'R' applies

REGISTERED APPRENTICES

	1st term 1-1000hrs	2nd term 1001-2000hrs	3rd term 2001-3000hrs	4th term 3001-4000hrs
07/01/2023	$ 27.46	$ 32.41	$ 37.12	$ 41.83

Supplemental Benefits per hour:

1st term	$ 3.85 - After 40 hours: $ 3.60
2nd term	$ 3.95 - After 40 hours: 3.60
3rd term	$ 4.45 - After 40 hours: 4.00
4th term	$ 5.00 - After 40 hours: 4.50

8-60H/H

Laborer - Tunnel 03/01/2024

JOB DESCRIPTION Laborer - Tunnel **DISTRICT** 11

ENTIRE COUNTIES
Columbia, Dutchess, Greene, Orange, Otsego, Putnam, Rockland, Sullivan, Ulster, Westchester

PARTIAL COUNTIES
Chenango: Townships of Columbus, Sherburne and New Berlin.
Delaware: Townships of Andes, Bovina, Middletown, Roxbury, Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield, Merideth and Davenport.

WAGES
Class 1: All support laborers/sandhogs working above the shaft or tunnel.

Class 2: All laborers/sandhogs working in the shaft or tunnel.

Class 4: Safety Miners

Class 5: Site work related to Shaft/Tunnel

WAGES: (per hour)

	07/01/2023	06/01/2024	06/01/2025
Class 1	$ 55.55	$ 57.05	$ 58.55
Class 2	57.70	59.20	60.70
Class 4	64.10	65.60	67.10
Class 5	47.65	49.90	51.40

Toxic and hazardous waste, lead abatement and asbestos abatement work will be paid an additional $ 3.00 an hour.

SHIFT DIFFERENTIAL...On all Government mandated irregular shift work:
- Employee shall be paid at time and one half the regular rate Monday through Friday.
- Saturday shall be paid at 1.65 times the regular rate.
- Sunday shall be paid at 2.15 times the regular rate.

SUPPLEMENTAL BENEFITS
Per hour:

Benefit 1	$ 35.73	$ 36.98	$ 38.23
Benefit 2	51.01	TBD	TBD
Benefit 3	71.28	TBD	TBD

Benefit 1 applies to straight time hours, paid holidays not worked.
Benefit 2 applies to over 8 hours in a day (M-F), irregular shift work hours worked, and Saturday hours worked.
Benefit 3 applies to Sunday and Holiday hours worked.

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

HOLIDAY
Paid: See (5, 6, 15, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE
When a recognized Holidays falls on Saturday or Sunday, holidays falling on Saturday shall be recognized or observed on Friday and holidays falling on Sunday shall be recognized or observed on Monday. Employees ordered to work on the Saturday or Sunday of the holiday or on the recognized or the observed Friday or Monday for those holidays falling on Saturday or Sunday shall receive double time the established rate and benefits for the holiday.

REGISTERED APPRENTICES
FOR APPRENTICE RATES, refer to the appropriate Laborer Heavy & Highway wage rate contained in the wage schedule for the County and location where the work is to be performed.

11-17/60/235/754Tun

Lineman Electrician 03/01/2024

JOB DESCRIPTION Lineman Electrician **DISTRICT** 6

ENTIRE COUNTIES

Westchester

WAGES

A Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors, assembly of all electrical materials, conduit, pipe or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

A Groundman/Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator equipment/operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

Below rates apply to electrical overhead and underground distribution and maintenance work and overhead and underground transmission line work, electrical substations, switching structures, continuous pipe-type underground fluid or gas filled transmission conduit and cable installations, maintenance jobs or projects, railroad catenary installations and maintenance, third rail installations, the bonding of rails and the installation of fiber optic cable. (Ref #14.04.01)

NOTE: Includes Teledata Work within ten (10) feet of High Voltage Transmission Lines. Also includes digging of holes for poles, anchors, footer, and foundations for electrical equipment.

Per hour:	07/01/2023	05/06/2024
Lineman, Tech, Welder	$ 60.41	$ 61.91
Crane, Crawler Backhoe	60.41	61.91
Cable Splicer-Pipe Type	66.45	68.10
Digging Mach Operator	54.37	55.72
Cert. Welder-Pipe Type	63.43	65.01
Tractor Trailer Driver	51.35	52.62
Groundman, Truck Driver	48.33	49.53
Equipment Mechanic	48.33	49.53
Flagman	36.25	37.15

Additional $1.00 per hour for entire crew when a helicopter is used.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%
3RD SHIFT	12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30, 2023 will expire within the granted time frame.

For Pre-Registered Projects Four (4), Ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

	07/01/2023	05/06/2024
Lineman, Technician, or Equipment Operators with Crane License	$ 29.40 *plus 7% of the hourly wage paid	$ 30.90 *plus 7% of the hourly wage paid
All other Journeyman	$ 26.40 *plus 7% of the hourly wage paid	$ 26.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q,) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept of Jurisdiction.
NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid	See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.
Overtime	See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyman Lineman wage.

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

SUPPLEMENTAL BENEFITS per hour:

07/01/2023	05/06/2024
$ 26.40 *plus 7% of the hourly wage paid	$ 26.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWest

Lineman Electrician - Teledata — 03/01/2024

JOB DESCRIPTION Lineman Electrician - Teledata **DISTRICT** 6

ENTIRE COUNTIES

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

WAGES

Per hour:

For outside work, stopping at first point of attachment (demarcation).

	07/01/2023	01/01/2024	01/01/2025
Cable Splicer	$ 37.73	$ 39.24	$ 40.81
Installer, Repairman	$ 35.81	$ 37.24	$ 38.73
Teledata Lineman	$ 35.81	$ 37.24	$ 38.73
Tech., Equip. Operator	$ 35.81	$ 37.24	$ 38.73
Groundman	$ 18.98	$ 19.74	$ 20.53

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED:

1ST SHIFT	REGULAR RATE
2ND SHIFT	REGULAR RATE PLUS 10%
3RD SHIFT	REGULAR RATE PLUS 15%

SUPPLEMENTAL BENEFITS

Per hour:

	07/01/2023	01/01/2024	01/01/2025
Journeyman	$ 5.70 *plus 3% of the hourly wage paid	$ 5.70 *plus 3% of the hourly wage paid	$ 5.70 *plus 3% of the hourly wage paid

*The 3% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY
See (B, E, Q) on OVERTIME PAGE
NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

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

6-1249LT - Teledata

Lineman Electrician - Traffic Signal, Lighting — 03/01/2024

JOB DESCRIPTION Lineman Electrician - Traffic Signal, Lighting **DISTRICT** 6

ENTIRE COUNTIES
Westchester

WAGES
Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors which includes, but is not limited to road loop wires; conduit and plastic or other type pipes that carry conductors, flex cables and connectors, and to oversee the encasement or burial of such conduits or pipes.

A Groundman/Groundman Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator/equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only.
(Ref #14.01.03)

Per hour:	07/01/2023	05/06/2024
Lineman, Technician	$ 54.73	$ 55.95
Crane, Crawler Backhoe	54.73	55.95
Certified Welder	57.47	58.75
Digging Machine	49.26	50.36
Tractor Trailer Driver	46.52	47.56
Groundman, Truck Driver	43.78	44.76
Equipment Mechanic	43.78	44.76
Flagman	32.84	33.57

Above rates are applicable for installation, testing, operation, maintenance and repair on all Traffic Control (Signal) and Illumination (Lighting) projects, Traffic Monitoring Systems, and Road Weather Information Systems. Includes digging of holes for poles, anchors, footer foundations for electrical equipment; assembly of all electrical materials or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%
3RD SHIFT	12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30, 2023 will expire within the granted time frame.

For Pre-Registered Projects Four (4), Ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS
Per hour worked (but also required on non-worked holidays):

	07/01/2023	05/06/2024
Lineman, Technician,	$ 29.40	$ 30.90

or Equipment Operators with Crane License	*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid
All other Journeyman	$ 26.40 *plus 7% of the hourly wage paid	$ 26.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY
See (B, E, Q) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept. of Jurisdiction.
NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY
Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.
Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES
WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyman Lineman wage.

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

SUPPLEMENTAL BENEFITS per hour:

07/01/2023	05/06/2024
$ 26.40 *plus 7% of the hourly wage paid	$ 26.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWestLT

Mason - Building — 03/01/2024

JOB DESCRIPTION Mason - Building **DISTRICT** 9

ENTIRE COUNTIES
Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour:	07/01/2023	12/04/2023	06/05/2024 Additional
Tile Setters	$ 62.98	$ 63.50	$ 0.72

SUPPLEMENTAL BENEFITS
Per Hour:

	$ 25.61*	$25.81*
	+ $10.04	+ $10.04

* This portion of benefits subject to same premium rate as shown for overtime wages.

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

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

REGISTERED APPRENTICES
Wage per hour:

(750 hour) term at the following wage rate:
Term:

	1st 1-750	2nd 751-1500	3rd 1501-2250	4th 2251-3000	5th 3001-3750	6th 3751-4500	7th 4501-5250	8th 5251-6000	9th 6001-6750	10th 6501-7000
07/01/2023	$21.70	$26.66	$33.75	$38.69	$42.25	$45.70	$49.29	$54.23	$57.09	$61.25
12/04/2023	$21.96	$26.95	$34.10	$39.08	$42.68	$46.16	$49.79	$54.77	57.66	$61.90

Supplemental Benefits per hour:

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
07/01/2023	$12.55* +$.73	$12.55* +$.78	$15.36* +$.88	$15.36* +$.88	$16.36* +$1.37	$17.86* +$1.42	$18.86* +$1.83	$18.86* +$1.88	$16.86* +$6.03	$22.11* +$6.61
12/04/2023	$12.55* +$0.73	$12.55* +$0.78	$15.63* +$0.89	$15.36* +$0.94	$16.36* +$1.38	$17.86* +$1.43	$18.86* +$1.84	$18.86* +$1.89	$16.86* +$6.04	$22.11* +$6.62

* This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/52A

Mason - Building — 03/01/2024

JOB DESCRIPTION Mason - Building **DISTRICT** 11

ENTIRE COUNTIES
Putnam, Rockland, Westchester

PARTIAL COUNTIES
Orange: Only the Township of Tuxedo.

WAGES
Per hour:

	07/01/2023
Bricklayer	$ 45.89
Cement Mason	45.89
Plasterer/Stone Mason	45.89
Pointer/Caulker	45.89

Additional $1.00 per hour for power saw work
Additional $0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular workday is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:
Irregular workday requires 15% premium
Second shift an additional 15% of wage plus benefits to be paid
Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS
Per hour:

Journeyman	$ 37.95

OVERTIME PAY
OVERTIME:

Cement Mason	See (B, E, Q, W) on OVERTIME PAGE.
All Others	See (B, E, Q) on OVERTIME PAGE.

HOLIDAY

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

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES
Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5wp-b

Mason - Building — 03/01/2024

JOB DESCRIPTION Mason - Building **DISTRICT** 9

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

WAGES
Building

Wages per hour:	07/01/2023	01/01/2024
Mosaic & Terrazzo Mechanic	$ 60.65	$ 60.57
Mosaic & Terrazzo Finisher	59.04	58.96

SUPPLEMENTAL BENEFITS
Per hour:

Mosaic & Terrazzo Mechanic	$ 30.26* + $9.16	$ 31.36* + $9.17
Mosaic & Terrazzo Finisher	$ 30.26* + $9.15	$ 31.36* + $9.16

*This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY
See (A, E, Q) on OVERTIME PAGE
07/01/2023- Deduct $7.25 from hourly wages before calculating overtime.
01/01/2024- Deduct $7.00 from hourly wages before calculating overtime.

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

REGISTERED APPRENTICES
Wages Per hour:

	1st 0-1500	2nd 1501-3000	3rd 3001-3750	4th 3751-4500	5th 4501-5250	6th 5251-6000
07/01/2023	$ 25.82	$ 32.19	$ 36.39	$ 40.38	$ 48.52	$ 54.59
01/01/2024	$ 25.05	$ 32.21	$ 37.93	$ 38.99	$ 47.18	$ 55.38

Supplemental Benefits per hour:

07/01/2023	$6.00* +$3.21	$7.72* +$4.12	$18.16* +$5.50	$23.27* +$6.41	$24.21* +$7.33	$27.24* +$8.29
01/01/2024	$7.12* +$3.21	$9.16* +$4.12	$17.22* +$5.51	$25.36* +$6.42	$26.36* +$7.34	$27.36* +$8.25

*This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/3

Mason - Building **03/01/2024**

JOB DESCRIPTION Mason - Building **DISTRICT** 9

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

WAGES
Per hour:

	07/01/2023	07/03/2023
Building-Marble Restoration:		
Marble, Stone & Terrazzo Polisher	$ 47.22	$ 47.44

SUPPLEMENTAL BENEFITS
Per Hour:
Journeyworker:

Building-Marble Restoration:		
Marble, Stone & Polisher	$ 30.29	$ 30.64

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

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

REGISTERED APPRENTICES
WAGES per hour:

900 hour term at the following wage:

1st 1-900	2nd 901-1800	3rd 1801-2700	4th 2701
$ 33.04	$ 37.78	$ 42.49	$ 47.22

Supplemental Benefits Per Hour:

27.65	28.52	29.41	30.29

07/03/2023
900 hour term at the following wage:

1st 1-900	2nd 901-1800	3rd 1801-2700	4th 2701
$ 33.19	$ 37.95	$ 42.69	$ 47.44

Supplemental Benefits Per Hour:

27.99	28.86	29.76	30.64

9-7/24-MP

Mason - Building **03/01/2024**

JOB DESCRIPTION Mason - Building **DISTRICT** 9

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

WAGES
Per Hour:

	07/01/2023	7/03/2023
Marble Cutters & Setters	$ 62.82	$ 63.12

SUPPLEMENTAL BENEFITS
Per Hour:

Journeyworker	$ 39.03	$ 39.34

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

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

REGISTERED APPRENTICES
Wage Per Hour:
07/01/2023
750 hour terms at the following wage

1st	2nd	3rd	4th	5th	6th	7th	8th
0-3000	3001-3750	3751-4500	4501-5250	5251-6000	6001-6750	6751-7500	7500+
$ 26.42	$ 39.62	$ 42.91	$ 46.22	$ 49.52	$ 53.38	$ 59.67	$ 62.82

Supplemental Benefits per hour:
07/01/2023

1st	2nd	3rd	4th	5th	6th	7th	8th
$ 25.38	$ 28.86	$ 29.74	$ 30.60	$ 31.48	$ 36.44	$ 38.17	$ 39.03

07/03/2023
Wage Per Hour:

750 hour terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th
0-3000	3001-3750	3751-4500	4501-5250	5251-6000	6001-6750	6751-7500	7500+
$ 26.60	$ 39.82	$ 43.13	$ 46.45	$ 49.78	$ 53.64	$ 59.95	$ 63.12

Supplemental Benefits Per Hour:

1st	2nd	3rd	4th	5th	6th	7th	8th
$ 25.54	$ 29.09	$ 29.97	$ 30.84	$ 31.72	$ 36.73	$ 38.48	$ 39.34

9-7/4

Mason - Building — 03/01/2024

JOB DESCRIPTION Mason - Building **DISTRICT** 9

ENTIRE COUNTIES
Nassau, Rockland, Suffolk, Westchester

WAGES
Per hour:

	07/01/2023	12/04/2023	06/03/2024
Tile Finisher	$ 48.36	$ 48.80	Additional $ 0.59

SUPPLEMENTAL BENEFITS
Per Hour:

	$ 22.56*	$ 22.71*
	+ $9.86	+ $9.86

*This portion of benefits subject to same premium rate as shown for overtime wages

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

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

9-7/88A-tf

Mason - Building 03/01/2024

JOB DESCRIPTION Mason - Building **DISTRICT** 9

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

WAGES

Per hour:	07/01/2023	07/03/2023
Marble, Stone, Maintenance Finishers:	$ 27.26	$ 27.44

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

SUPPLEMENTAL BENEFITS
Per Hour:

Marble, Stone Maintenance Finishers:	$ 14.97	$ 15.20

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

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

REGISTERED APPRENTICES
WAGES per hour:

	07/01/2023	07/03/2023
0-750	$ 21.89	$ 22.04
751-1500	22.60	$ 22.75
1501-2250	23.32	$ 23.48
2251-3000	24.04	$ 24.20
3001-3750	25.11	$ 25.27
3751-4500	26.54	$ 26.72
4501+	27.26	$ 27.44

Supplemental Benefits:
Per hour:

0-750	12.03	$ 12.24
751-1500	12.43	$ 12.64
1501-2250	12.82	$ 13.03
2251-3000	13.21	$ 13.42
3001-3750	13.80	$ 14.02
3751-4500	14.58	$ 14.80
4501+	14.97	$ 15.20

9-7/24M-MF

Mason - Building / Heavy&Highway 03/01/2024

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

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

WAGES

Per hour:	07/01/2023	07/03/2023	01/01/2024
Marble-Finisher	$ 49.32	$ 49.65	$ 49.92

SUPPLEMENTAL BENEFITS
Journeyworker:
Per hour

Marble- Finisher	$ 36.62	$ 36.67	$ 36.93

OVERTIME PAY
See (B, E, Q, V) on OVERTIME PAGE
Work beyond 8 hours on a Saturday shall be paid at double the rate.

HOLIDAY
Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE
When an observed holiday falls on a Sunday, it will be observed the next day.

9-7/20-MF

Mason - Heavy&Highway 03/01/2024

JOB DESCRIPTION Mason - Heavy&Highway **DISTRICT** 11

ENTIRE COUNTIES
Putnam, Rockland, Westchester

PARTIAL COUNTIES
Orange: Only the Township of Tuxedo.

WAGES
Per hour:

	07/01/2023
Bricklayer	$ 46.39
Cement Mason	46.39
Marble/Stone Mason	46.39
Plasterer	46.39
Pointer/Caulker	46.39

Additional $1.00 per hour for power saw work
Additional $0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular workday is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:
Irregular workday requires 15% premium
Second shift an additional 15% of wage plus benefits to be paid
Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS
Per hour:

Journeyman	$ 37.95

OVERTIME PAY
Cement Mason See (B, E, Q, W)
All Others See (B, E, Q,)

HOLIDAY
Paid: See (5, 6, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE
- Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.
- Supplemental Benefits are not paid for paid Holiday
- If Holiday is worked, Supplemental Benefits are paid for hours worked.
- Whenever an Employee works within three (3) calendar days before a holiday, the Employee shall be paid for the Holiday.

REGISTERED APPRENTICES
Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5WP-H/H

Operating Engineer - Building — 03/01/2024

JOB DESCRIPTION Operating Engineer - Building **DISTRICT** 9

ENTIRE COUNTIES
Bronx, Kings, New York, Putnam, Queens, Richmond, Westchester

PARTIAL COUNTIES
Dutchess: that part of Dutchess County lying south of the North City Line of the City of Poughkeepsie.

WAGES
NOTE: Construction surveying
Party Chief--One who directs a survey party
Instrument Man--One who runs the instrument and assists Party Chief.
Rodman--One who holds the rod and assists the Survey Crew

Wages:(Per Hour)	07/01/2023
Building Construction:	
Party Chief	$ 77.39
Instrument Man	61.25
Rodman	41.39
Steel Erection:	
Party Chief	80.16
Instrument Man	63.60
Rodman	44.23
Heavy Construction-NYC counties only: (Foundation, Excavation.)	
Party Chief	85.74
Instrument man	64.40
Rodman	54.90

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2023
Building Construction	$ 28.04* +$ 7.65
Steel Erection	28.64* +$ 7.65
Heavy Construction	28.85* +$ 7.64

* This portion subject to same premium as wages

Non-Worked Holiday Supplemental Benefit:
21.19

OVERTIME PAY
See (A, B, E, Q) on OVERTIME PAGE
Code "A" applies to Building Construction and has double the rate after 7 hours on Saturdays.
Code "B" applies to Heavy Construction and Steel Erection and had double the rate after 8 hours on Saturdays.

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

9-15Db

Operating Engineer - Building — 03/01/2024

JOB DESCRIPTION Operating Engineer - Building **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I:
Cranes (All Types up to 49 tons), Boom Trucks, Cherry Pickers (All Types), Clamshell Crane, Derrick (Stone and Steel), Dragline, Franki Pile Rig or similar, High Lift (Lull or similar) with crane attachment and winch used for hoisting or lifting, Hydraulic Cranes, Pile Drivers, Potain and similar.

Cranes (All types 50-99 tons), Drill Rig Casa Grande (CAT or similar), Franki Pile Rig or similar, Hydraulic Cranes (All types including Crawler Cranes- No specific boom length).

Cranes (All types 100 tons and over), All Tower Cranes, All Climbing Cranes irrespective of manufacturer and regardless of how the same is rigged, Franki Pile Rig or similar, Conventional Cranes (All types including Crawler Cranes-No specific boom length), Hydraulic Cranes.

GROUP I-A: Barber Green Loader-Euclid Loader, Bulldozer, Carrier-Trailer Horse, Concrete Cleaning Decontamination Machine Operator, Concrete-Portable Hoist, Conway or Similar Mucking Machines, Elevator & Cage, Excavators all types, Front End Loaders, Gradall, Shovel, Backhoe, etc.(Crawler or Truck), Heavy Equipment Robotics Operator/Mechanic, Hoist Engineer-Material, Hoist Portable Mobile Unit, Hoist(Single, Double or Triple Drum), Horizontal Directional Drill Locator, Horizontal Directional Drill Operator and Jersey Spreader, Letourneau or Tournapull(Scrapers over 20 yards Struck), Lift Slab Console, etc., Lull HiLift or Similar, Master Environmental Maintenance Mechanics, Mucking Machines Operator/Mechanic or Similar Type, Overhead Crane, Pavement Breaker(Air Ram), Paver(Concrete), Post Hole Digger, Power House Plant, Road Boring Machine, Road Mix Machine, Ross Carrier and Similar Machines, Rubber tire double end backhoes and similar machines, Scoopmobile Tractor-Shovel Over 1.5 yards, Shovel (Tunnels), Spreader (Asphalt) Telephie(Cableway), Tractor Type Demolition Equipment, Trenching Machines-Vermeer Concrete Saw Trencher and Similar, Ultra High Pressure Waterjet Cutting Tool System, Vacuum Blasting Machine operator/mechanic, Winch Truck A Frame.

GROUP I-B: Compressor (Steel Erection), Mechanic (Outside All Types), Negative Air Machine (Asbestos Removal), Push Button (Buzz Box) Elevator.

GROUP II: Compactor Self-Propelled, Concrete Pump, Crane Operator in Training (Over 100 Tons), Grader, Machines Pulling Sheep's Foot Roller, Roller (4 ton and over), Scrapers (20 yards Struck and Under), Vibratory Rollers, Welder.

GROUP III-A: Asphalt Plant, Concrete Mixing Plants, Forklift (All power sources), Joy Drill or similar, Tractor Drilling Machine, Loader (1 1/2 yards and under), Portable Asphalt Plant, Portable Batch Plant, Portable Crusher, Skid Steer (Bobcat or similar), Stone Crusher, Well Drilling Machine, Well Point System.

GROUP III-B: Compressor Over 125 cu. Feet, Conveyor Belt Machine regardless of size, Compressor Plant, Ladder Hoist, Stud Machine.

GROUP IV-A: Batch Plant, Concrete Breaker, Concrete Spreader, Curb Cutter Machine, Finishing Machine-Concrete, Fine Grading Machine, Hepa Vac Clean Air Machine, Material Hopper(sand, stone, cement), Mulching Grass Spreader, Pump Gypsum etc, Pump-Plaster-Grout-Fireproofing. Roller(Under 4 Ton),Spreading and Fine Grading Machine, Steel Cutting Machine, Siphon Pump, Tar Joint Machine, Television Cameras for Water, Sewer, Gas etc. Turbo Jet Burner or Similar Equipment, Vibrator (1 to 5).

GROUP IV-B: Compressor (all types), Heater (All Types), Fire Watchman, Lighting Unit (Portable & Generator) Pump, Pump Station(Water, Sewer, Portable, Temporary), Welding Machine (Steel Erection & Excavation).

GROUP V: Mechanics Helper, Motorized Roller (walk behind), Stock Attendant, Welder's Helper, Maintenance Engineer Crane(75 ton and over).

Group VI-A: Welder Certified
GROUP VI-B: Utility Man, Warehouse Man.

WAGES: (per hour)

	07/01/2023	03/04/2024
GROUP I		
Cranes- up to 49 tons	$ 66.23	$ 67.43
Cranes- 50 tons to 99 tons	68.53	69.77
Cranes- 100 tons and over	78.21	79.64
GROUP I-A	58.01	59.04
GROUP I-B	53.48	54.41
GROUP II	55.98	56.97
GROUP III-A	53.94	54.88
GROUP III-B	51.35	52.25
GROUP IV-A	53.40	54.33
GROUP IV-B	45.17	45.94
GROUP V	48.69	49.53

Group VI-A	56.96	57.96
GROUP VI-B		
Utility Man	46.21	47.00
Warehouse Man	48.52	49.26

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects.
Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional $2.00 per hour.
Engineers operating cranes with booms 149 feet or over in length will be paid an additional $3.00 per hour.
Loader operators over 5 cubic yard capacity additional .50 per hour.
Shovel operators over 4 cubic yard capacity additional $1.00 per hour.

SUPPLEMENTAL BENEFITS
Per hour:

Journeyworker	$ 31.57	$ 32.32

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

HOLIDAY
Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

8-137B

Operating Engineer - Heavy&Highway 03/01/2024

JOB DESCRIPTION Operating Engineer - Heavy&Highway **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Westchester

PARTIAL COUNTIES
Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES
GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane, (Crawler, Truck),
Dragline, Drill Rig (Casa Grande, Cat, or Similar), Floating Crane (Crane on Barges) under 100 tons, Gin Pole, Hoist Engineer-Concrete (Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger (Truck or Truck Mounted), Boat Captain, Bulldozer-All Sizes, Central Mix Plant Operator, Chipper (all types), Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader (Motor Grader), Elevator & Cage (Materials or Passenger), Excavator (and all attachments), Front End Loaders (1 1/2 yards and over), High Lift Lull and similar, Hoist (Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer (Material), Jack and Bore Machine, Log Skidders, Mill Machines, Mucking Machines, Overhead Crane, Paver (concrete), Post Pounder (of any type), Push Cats, Road Reclaimer, Robot Hammer (Brokk or similar), Robotic Equipment (Scope of Engineer Schedule), Ross Carrier and similar, Scrapers (20 yard struck and over), Side Boom, Slip Form Machine, Spreader (Asphalt), Trenching Machines (Telephies-Vermeer Concrete Saw), Tractor Type Demolition Equipment, Vacuum Truck. Vibratory Roller(Riding) or Roller used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver (Asphalt).

GROUP II-A: Ballast Regulators, Compactor Self Propelled, Fusion Machine, Rail Anchor Machines, Roller (4 ton and over), Scrapers (20 yard struck and under).

GROUP II-B: Mechanic (Outside) All Types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler (High Pressure), Concrete Breaker (Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift (all types), Gas Tapping (Live), Hydroseeder, Loader (1 1/2 yards and under), Locomotive (all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher (Apprentice), Powerhouse Plant, Roller (under 4 ton), Sheer Excavator, Skid Steer/Bobcat, Stone Crusher, Sweeper (with seat), Well Drilling Machine.

GROUP IV: Service Person (Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine (Truck Mounted), Heater (all types), Lighting Unit (Portable), Maintenance Engineer (For Crane Only), Mechanics Helper, Pump (Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck (Sewer Jet or Similar), Welders Helper, Welding Machine (Steel Erection), Well Point System.

GROUP V: All Tower Cranes-All Climbing Cranes and all cranes of 100-ton capacity or greater (3900 Manitowac or similar) irrespective of manufacturer and regardless of how the same is rigged, Hoist Engineer (Steel), Engineer-Pile Driver, Jersey Spreader, Pavement Breaker/Post Hole Digger.

WAGES: Per hour:	07/01/2023	03/04/2024
Group I	$ 67.27	$ 68.63
Group I-A	59.26	60.42
Group I-B	62.46	63.70
Group II-A	56.74	57.84
Group II-B	58.52	59.67
Group III	55.74	56.81
Group IV	50.63	51.57
Group IV-B	43.43	44.19
Group V		
Engineer All Tower, Climbing and Cranes of 100 Tons	76.24	77.82
Hoist Engineer(Steel)	69.01	70.41
Engineer(Pile Driver)	73.61	75.13
Jersey Spreader, Pavement Breaker (Air Ram)Post Hole Digger	58.06	59.19

SHIFT DIFFERENTIAL:
A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts on all government mandated off-shift work

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional $2.00 per hour over the rate listed in the Wage Schedule. Engineers operating cranes with booms 149 feet or over in length will be paid an additional $3.00 per hour over the rate listed in the Wage Schedule. Loader and Excavator Operators: over 5 cubic yards capacity $0.50 per hour over the rate listed in the Wage Schedule. Shovel Operators: over 4 cubic yards capacity $1.00 per hour over the rate listed in the Wage Schedule.

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30,2023 will expire within the granted time frame.

For Pre-Registered Projects Four (4), Ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS
Per hour:

Journeyworker:	$ 33.75 up to 40 Hours	$ 34.85 up to 40 hours
	After 40 hours $ 24.50* PLUS $ 1.25 on all hours worked	After 40 hours $ 25.55* PLUS $ 1.25 on all hours worked

*This amount is subject to premium

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

HOLIDAY
Paid:..... See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
Overtime..... See (5, 6, 8, 15, 25, 26) on OVERTIME PAGE

* For Holiday codes 8,15,25,26 code R applies
** For Holiday Codes 5 & 6 code U applies

Note: If employees are required to work on Easter Sunday they shall be paid at the rate of triple time.

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

1st term	$ 29.63	$ 30.21
2nd term	35.56	36.25
3rd term	41.48	42.30
4th term	47.41	48.34
Supplemental Benefits per hour:		
	25.70	26.85

Operating Engineer - Heavy&Highway **03/01/2024**

JOB DESCRIPTION Operating Engineer - Heavy&Highway **DISTRICT** 9

ENTIRE COUNTIES
Putnam, Westchester

PARTIAL COUNTIES
Dutchess: South of the North city line of Poughkeepsie

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

Per Hour:	07/01/2023
Party Chief	$ 81.72
Instrument Man	61.43
Rodman	52.40

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2023
All Categories	
Straight Time:	$ 25.25* + $7.64
Premium:	
Time & 1/2	$ 37.88* + $7.64
Double Time	$ 50.50* + $7.64

Non-Worked Holiday Supplemental Benefits:
$ 21.19

OVERTIME PAY
See (B, *E, Q) on OVERTIME PAGE
* Doubletime paid on all hours in excess of 8 hours on Saturday

HOLIDAY
Paid: See (5, 6, 7, 11, 12) on HOLIDAY PAGE
Overtime: See (5, 6, 7, 11, 12) on HOLIDAY PAGE

9-15Dh

Operating Engineer - Heavy&Highway - Tunnel **03/01/2024**

JOB DESCRIPTION Operating Engineer - Heavy&Highway - Tunnel **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Westchester

PARTIAL COUNTIES
Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES
GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane(Crawler, Truck), Dragline, Drill Rig Casa Grande(Cat or Similar), Floating Crane(Crane on Barge-Under 100 Tons), Hoist Engineer(Concrete/Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger(Truck or Truck Mounted), Boat Captain, Bull Dozer-all sizes, Central Mix Plant Operator, Chipper-all types, Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader(Motor Grader), Elevator & Cage(Materials or Passengers), Excavator(and all attachments), Front End Loaders(1 1/2 yards and over), High Lift Lull, Hoist(Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer(Material), Jack and Bore Machine, Log Skidder, Milling Machine, Moveable Concrete Barrier Transfer & Transport Vehicle, Mucking Machines. Overhead Crane, Paver(Concrete), Post Pounder of any type, Push Cats, Road Reclaimer, Robot Hammer(Brokk or similar), Robotic Equipment(Scope of Engineer Schedule), Ross Carrier and similar machines, Scrapers(20 yards struck and over), Side Boom, Slip Form Machine, Spreader(Asphalt), Trenching Machines, Telephies-Vermeer Concrete Saw, Tractor type demolition equipment, Vacuum Truck, Vibratory Roller (Riding) used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver(Asphalt).

GROUP II-A: Ballast Regulators, Compactor(Self-propelled), Fusion Machine, Rail Anchor Machines, Roller(4 ton and over), Scrapers(20 yard struck and under).

GROUP II-B: Mechanic(outside)all types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler(High Pressure), Concrete Breaker(Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift(all types of power), Gas Tapping(Live), Hydroseeder, Loader(1 1/2 yards and under), Locomotive(all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher(Apprentice), Powerhouse Plant, Roller(under 4 ton), Sheer Excavator, Skidsteer/Bobcat, Stone Crusher, Sweeper(with seat), Well Drilling Machine.

GROUP IV-A: Service Person(Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine(Truck Mounted), Heater(all types), Lighting Unit(Portable), Maintenance Engineer(for Crane only), Mechanics Helper, Pump(Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck(Sewer Jet or similar), Welding Machine(Steel Erection), Welders Helper.

GROUP V-A: Engineer(all Tower Cranes, all Climbing Cranes & all Cranes of 100 ton capacity or greater),Hoist Engineer(Steel-Sub Structure), Engineer-Pile Driver, Jersey-Spreader, Pavement breaker, Post Hole Digger

WAGES: (per hour)

	07/01/2023	03/04/2024
GROUP I	$ 67.27	$ 68.63
GROUP I-A	59.26	60.42
GROUP I-B	62.46	63.70
GROUP II-A	56.74	57.84
GROUP II-B	58.52	59.67
GROUP III	55.74	56.81
GROUP IV-A	50.63	51.57
GROUP IV-B	43.43	44.19
GROUP V-A		
Engineer-Cranes	76.24	77.82
Engineer-Pile Driver	73.61	75.13
Hoist Engineer	69.01	70.41
Jersey Spreader/Post Hole Digger	58.06	59.19

SHIFT DIFFERENTIAL:
A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts on all government mandated off-shift work

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects. Operators required to use two buckets pouring concrete on other than road pavement shall receive $0.50 per hour over scale. Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional $2.00 per hour. Engineers operating cranes with booms 149 feet or over in length will be paid an additional $3.00 per hour. Operators of shovels with a capacity over (4) cubic yards shall be paid an additional $1.00 per hour. Operators of loaders with a capacity over (5) cubic yards shall be paid an additional $0.50 per hour.

SUPPLEMENTAL BENEFITS
Per hour:
Journeyworker:

$ 33.75 up to 40 hours After 40 hours $24.50 plus $1.25 on all hours worked	$ 34.85 up to 40 hours After 40 hours $25.55 plus $1.25 on all hours worked

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

HOLIDAY
Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
* Note: For Holiday codes 5 & 6, code U applies. For Holiday codes 8, 15, 25, 26, code R applies.
Note: If employees are required to work on Easter Sunday, they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1)year terms at the following rates:

1st term	$ 29.63	$ 30.21
2nd term	35.56	36.25
3rd term	41.48	42.30
4th term	47.41	48.34

Supplemental Benefits per hour:

All terms	$ 25.70	$ 26.85

8-137Tun

Operating Engineer - Marine Dredging 03/01/2024

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

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

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

Per Hour:	07/01/2023	10/01/2023
CLASS A1 Deck Captain, Leverman Mechanical Dredge Operator Licensed Tug Operator 1000HP or more.	$ 43.94	$ 45.26
CLASS A2 Crane Operator (360 swing)	39.16	40.33
CLASS B Dozer, Front Loader Operator on Land	To conform to Operating Engineer Prevailing Wage in locality where work is being performed including benefits.	
CLASS B1 Derrick Operator (180 swing) Spider/Spill Barge Operator Operator II, Fill Placer, Engineer, Chief Mate, Electrician, Chief Welder, Maintenance Engineer Licensed Boat, Crew Boat Operator	38.00	39.14
CLASS B2 Certified Welder	35.77	36.84
CLASS C1 Drag Barge Operator, Steward, Mate, Assistant Fill Placer	34.79	35.83
CLASS C2 Boat Operator	33.67	34.68
CLASS D Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor	27.97	28.81

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

All Classes A & B	$ 11.85 plus 6% of straight time	$ 12.00 plus 6% of straight time

	wage, Overtime hours add $ 0.63	wage, Overtime hours add $ 0.63
All Class C	$ 11.60 plus 6% of straight time wage, Overtime hours add $ 0.50	$ 11.75 plus 6% of straight time wage, Overtime hours add $ 0.50
All Class D	$ 11.35 plus 6% of straight time wage, Overtime hours add $ 0.38	$ 11.60 plus 6% of straight time wage, Overtime hours add $ 0.50

OVERTIME PAY
See (B2, F, R) on OVERTIME PAGE

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

4-25a-MarDredge

Operating Engineer - Survey Crew - Consulting Engineer — 03/01/2024

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

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

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

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

Per hour:	07/01/2023
Survey Classifications	
Party Chief	$ 47.15
Instrument Man	39.30
Rodman	34.35

SUPPLEMENTAL BENEFITS
Per Hour:

All Crew Members: $ 23.15

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

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

9-15dconsult

Painter — 03/01/2024

JOB DESCRIPTION Painter **DISTRICT** 8

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

WAGES

Per hour:	07/01/2023
Brush	$ 51.70*
Abatement/Removal of lead based or lead containing paint on materials to be repainted.	51.70*

Spray & Scaffold	$ 54.70*
Fire Escape	54.70*
Decorator	54.70*
Paperhanger/Wall Coverer	54.48*

*Subtract $ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS
Per hour:

Paperhanger	$ 34.60
All others	32.73
Premium	36.70**

**Applies only to "All others" category, not paperhanger journeyworker.

OVERTIME PAY
See (A, H) on OVERTIME PAGE

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

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

Per hour:	07/01/2023
Appr 1st term...	$ 19.95*
Appr 2nd term...	25.56*
Appr 3rd term...	31.05*
Appr 4th term...	41.62*

*Subtract $ 0.10 to calculate premium rate.

Supplemental benefits:
Per Hour:

Appr 1st term...	$ 16.06
Appr 2nd term...	19.95
Appr 3rd term...	23.02
Appr 4th term...	29.16

8-NYDC9-B/S

Painter — 03/01/2024

JOB DESCRIPTION Painter **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Suffolk, Westchester

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

WAGES

Per hour:	07/01/2023
Drywall Taper	$ 51.45*

*Subtract $ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS
Per hour:

Journeyman	$ 30.88

OVERTIME PAY
See (A, H) on OVERTIME PAGE

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

REGISTERED APPRENTICES

Wages - Per Hour:

1500 hour terms at the following wage rate:

1st term	$ 19.95*
2nd term	25.56*
3rd term	31.00*
4th term	41.52*

*Subtract $ 0.10 to calculate premium rate.

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

1st year	$ 15.22
2nd year	18.90
3rd year	21.81
4th year	27.58

8-NYDCT9-DWT

Painter - Bridge & Structural Steel — 03/01/2024

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

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

WAGES
Per Hour:
STEEL:

Bridge Painting:	07/01/2023	10/01/2023
	$ 54.50	$ 56.00
	+ 10.10*	+ 10.35*

ADDITIONAL $6.50 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

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

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

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

SHIFT WORK:

When directly specified in public agency or authority contract documents for an employer to work a second shift and works the second shift with employees other than from the first shift, all employees who work the second shift will be paid 10% of the base wage shift differential in lieu of overtime for the first eight (8) hours worked after which the employees shall be paid at time and one half of the regular wage rate. When a single irregular work shift is mandated in the job specifications or by the contracting agency, wages shall be paid at time and one half for single shifts between the hours of 3pm-11pm or 11pm-7am.

SUPPLEMENTAL BENEFITS
Per Hour:
Journeyworker:

	$ 11.78	$ 12.43
	+ 30.85*	+ 31.55*

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

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

HOLIDAY

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

REGISTERED APPRENTICES
Wage - Per hour:
Apprentices: (1) year terms.

1st year	$ 21.80	$ 22.40
	+ 4.04	+ 4.14
2nd year	$ 32.70	$ 33.60
	+ 6.06	+ 6.21
3rd year	$ 43.60	$ 44.80
	+ 8.08	+ 8.28

Supplemental Benefits - Per hour:

1st year	$ .90	$ 1.16
	+ 12.34	+ 12.62
2nd year	$ 7.07	$ 7.46
	+ 18.51	+ 18.93
3rd year	$ 9.42	$ 9.94
	+ 24.68	+ 25.24

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

8-DC-9/806/155-BrSS

Painter - Line Striping — 03/01/2024

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

ENTIRE COUNTIES
Albany, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Montgomery, Nassau, Orange, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES
Per hour:

Painter (Striping-Highway):	07/01/2023	01/01/2024	07/01/2024
Striping-Machine Operator*	$ 31.53	$ 31.53	$ 34.12
Linerman Thermoplastic	38.34	38.34	41.12

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

NOTE - The "Employer Registration" (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30,2023 will expire within the granted time frame.

For Pre-Registered Projects Four (4), Ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS
Per hour paid:
Journeyworker:

Striping Machine Operator:	$ 10.03	$ 22.24	$ 23.65
Linerman Thermoplastic:	10.03	22.24	23.65

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

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

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

1st Term:	$ 15.00	$ 15.00	$ 15.00

2nd Term:	18.92	18.92	20.47
3rd Term:	25.22	25.22	27.30

Supplemental Benefits per hour:

1st term:	$ 9.16	$ 22.24	$ 23.65
2nd Term:	10.03	22.24	23.65
3rd Term:	10.03	22.24	23.65

8-1456-LS

Painter - Metal Polisher — 03/01/2024

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

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

WAGES

	07/01/2023
Metal Polisher	$ 38.18
Metal Polisher*	39.28
Metal Polisher**	42.18

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

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2023
Journeyworker:	
All classification	$ 12.34

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

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

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

	07/01/2023
1st year	$ 16.00
2nd year	17.00
3rd year	18.00
1st year*	$ 16.39
2nd year*	17.44
3rd year*	18.54
1st year**	$ 18.50
2nd year**	19.50
3rd year**	20.50

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

Supplemental benefits:
Per hour:

1st year	$ 8.69
2nd year	8.69
3rd year	8.69

8-8A/28A-MP

Plumber — 03/01/2024

JOB DESCRIPTION Plumber **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Westchester

WAGES
Per hour:

	07/01/2023
Plumber and Steamfitter	$ 62.36

SHIFT WORK:
When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS
Per hour:

Journeyworker	$ 41.51

OVERTIME PAY
See (B, E, E2, Q, V) on OVERTIME PAGE
OVERTIME:... See on OVERTIME PAGE.

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

REGISTERED APPRENTICES
(1)year terms at the following wages:

1st Term	$ 23.20
2nd Term	26.61
3rd Term	30.74
4th Term	43.81
5th Term	46.99

Supplemental Benefits per hour:

1st term	$ 17.12
2nd term	19.12
3rd term	22.74
4th term	30.02
5th term	31.82

8-21.1-ST

Plumber - HVAC / Service — 03/01/2024

JOB DESCRIPTION Plumber - HVAC / Service **DISTRICT** 8

ENTIRE COUNTIES
Dutchess, Putnam, Westchester

PARTIAL COUNTIES
Delaware: Only the townships of Middletown and Roxbury
Ulster: Entire County(including Wallkill and Shawangunk Prisons) except for remainder of Town of Shawangunk and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES
Per hour:

	07/01/2023
HVAC Service	$ 42.68
	+ $ 4.37*

*Note: This portion of wage is not subject to overtime premium.

SUPPLEMENTAL BENEFITS
Per hour:

Journeyworker HVAC Service	$ 28.99

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

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

REGISTERED APPRENTICES
HVAC SERVICE

(1)year terms at the following wages:

1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
$ 19.32	$ 22.91	$ 28.56	$ 35.13	$ 38.15
+$2.39*	+$2.70*	+$3.25*	+$3.88*	+$4.12*

*Note: This portion of wage is not subject to overtime premium.

Supplemental Benefits per hour:

Apprentices	07/01/2023
1st term	$ 20.84
2nd term	22.28
3rd term	23.85
4th term	26.01
5th term	27.55

8-21.1&2-SF/Re/AC

Plumber - Jobbing & Alterations — 03/01/2024

JOB DESCRIPTION Plumber - Jobbing & Alterations **DISTRICT** 8

ENTIRE COUNTIES
Dutchess, Putnam, Westchester

PARTIAL COUNTIES
Ulster: Entire county (including Wallkill and Shawangunk Prisons in Town of Shawangunk) EXCEPT for remainder of Town of Shawangunk, and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES
Per hour: 07/01/2023
Journeyworker: $ 48.51

Repairs, replacements and alteration work is any repair or replacement of a present plumbing system that does not change existing roughing or water supply lines.

SHIFT WORK:
When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS
Per hour:
Journeyworker
$ 34.76

OVERTIME PAY
See (B, *E, E2, Q, V) on OVERTIME PAGE
*When used as a make-up day, hours after 8 on Saturday shall be paid at time and one half.

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

REGISTERED APPRENTICES
(1) year terms at the following wages:

1st year	$ 20.92
2nd year	23.24
3rd year	25.29

4th year	35.48
5th year	37.49

Supplemental Benefits per hour:

1st year	$ 11.45
2nd year	13.46
3rd year	17.51
4th year	23.67
5th year	25.68

8-21.3-J&A

Roofer — 03/01/2024

JOB DESCRIPTION Roofer **DISTRICT** 9

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

WAGES

Per Hour:	07/01/2023	05/01/2024 Additional
Roofer/Waterproofer	$ 46.50 + $7.00*	$2.50

* This portion is not subjected to overtime premiums.

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

SUPPLEMENTAL BENEFITS
Per Hour: $ 31.37

OVERTIME PAY
See (B, H) on OVERTIME PAGE
Note: An observed holiday that falls on a Sunday will be observed the following Monday.

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

REGISTERED APPRENTICES
(1) year term apprentices indentured prior to 01/01/2023

1st	2nd	3rd	4th
$ 16.28	$ 23.25 + 3.50*	$ 27.90 + 4.20*	$ 34.88 + 5.26*

Supplements:

1st	2nd	3rd	4th
$ 4.03	$ 15.85	$ 18.95	$ 23.61

* This portion is not subjected to overtime premiums.

(1) year term apprentices indentured after 01/01/2023

1st	2nd	3rd	4th	5th
$ 17.67	$ 20.93 + 3.16*	$ 23.25 + 3.50*	$ 27.90 + 4.20*	$ 34.88 + 5.26

Supplements:

1st	2nd	3rd	4th	5th
$ 7.61	$ 14.29	$ 15.85	$ 18.95	$ 23.61

* This portion is not subjected to overtime premiums.

9-8R

Sheetmetal Worker — 03/01/2024

JOB DESCRIPTION Sheetmetal Worker **DISTRICT** 8

ENTIRE COUNTIES
Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

	07/01/2023
SheetMetal Worker	$ 47.00 + 3.60*

*This portion is not subject to overtime premiums.

SHIFT WORK
For all NYS D.O.T. and other Governmental mandated off-shift work:
10% increase for additional shifts for a minimum of five (5) days

SUPPLEMENTAL BENEFITS
Journeyworker $ 45.62

OVERTIME PAY
OVERTIME:.. See (B, E, Q,) on OVERTIME PAGE.

HOLIDAY
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6, 8, 15, 16, 23) on HOLIDAY PAGE

REGISTERED APPRENTICES

1st	2nd	3rd	4th	5th	6th	7th	8th
$ 17.50 + 1.44*	$ 19.67 + 1.62*	$ 21.87 + 1.80*	$ 24.05 + 1.98*	$ 26.24 + 2.16*	$ 28.44 + 2.34*	$ 31.10 + 2.52*	$ 33.75 + 2.70*

*This portion is not subject to overtime premiums.

Supplemental Benefits per hour:

Apprentices	
1st term	$ 19.53
2nd term	21.99
3rd term	24.42
4th term	26.88
5th term	29.32
6th term	31.75
7th term	33.72
8th term	35.71

8-38

Sheetmetal Worker — 03/01/2024

JOB DESCRIPTION Sheetmetal Worker **DISTRICT** 4

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

WAGES
Per Hour: 07/01/2023

Sign Erector $ 56.00

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

SUPPLEMENTAL BENEFITS
Per Hour: 07/01/2023

Sign Erector $ 55.66

OVERTIME PAY
See (A, F, S) on OVERTIME PAGE

HOLIDAY
Paid: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE
Overtime: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES
Per Hour:
6 month Terms at the following percentage of Sign Erectors wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
35%	40%	45%	50%	55%	60%	65%	70%	75%	80%

SUPPLEMENTAL BENEFITS
Per Hour:

07/01/2023

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th

$ 14.95	$ 16.95	$ 18.93	$ 20.93	$ 28.56	$ 31.05	$ 33.57	$ 36.05	$ 38.56	$ 41.05

4-137-SE

Sprinkler Fitter — 03/01/2024

JOB DESCRIPTION Sprinkler Fitter **DISTRICT** 1

ENTIRE COUNTIES
Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES
Per hour

	07/01/2023
Sprinkler Fitter	$ 50.86

SUPPLEMENTAL BENEFITS
Per hour

Journeyperson	$ 30.19

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

HOLIDAY
Paid: See (1) on HOLIDAY PAGE
Overtime: See (5, 6) on HOLIDAY PAGE
Note: When a holiday falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double time rate. When a holiday falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double time rate.

REGISTERED APPRENTICES
Wages per hour

One Half Year terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
$ 24.77	$ 27.53	$ 30.03	$ 32.78	$ 35.53	$ 38.29	$ 41.04	$ 43.79	$ 46.54	$ 49.30

Supplemental Benefits per hour

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
$ 8.74	$ 8.74	$ 20.32	$ 20.32	$ 20.57	$ 20.57	$ 20.57	$ 20.57	$ 20.57	$ 20.57

1-669.2

Teamster - Building / Heavy&Highway — 03/01/2024

JOB DESCRIPTION Teamster - Building / Heavy&Highway **DISTRICT** 8

ENTIRE COUNTIES
Putnam, Westchester

WAGES
GROUP A: Straight Trucks (6-wheeler and 10-wheeler), A-frame, Winch, Dynamite Seeding, Mulching, Agitator, Water, Attenuator, Light Towers, Cement (all types), Suburban, Station Wagons, Cars, Pick Ups, any vehicle carrying materials of any kind.
GROUP AA: Tack Coat
GROUP B: Tractor & Trailers (all types).
GROUP BB: Tri-Axle,14 Wheeler
GROUP C: Low Boy (carrying equipment).
GROUP D: Fuel Trucks, Tire Trucks.
GROUP E: Off-road Equipment (over 40 tons): Athey Wagons, Belly Dumps, Articulated Dumps, Trailer Wagons.
GROUP F: Off-road Equipment (over 40 tons) Euclid, DJB.
GROUP G: Off-road Equipment (under 40 tons) Athey Wagons, Belly Articulated Dumps, Trailer Wagons.
GROUP H: Off-road Equipment(under 40 tons), Euclid.
GROUP HH: Off-road Equipment(under 40 tons) D.J.B.
GROUP I: Off-road Equipment(under 40 tons) Darts.
GROUP II: Off-road Equipment(under 40 tons) RXS.

WAGES:(per hour)

	07/01/2023
GROUP A	$ 46.86*

GROUP AA	49.86*
GROUP B	47.48*
GROUP BB	46.98*
GROUP C	49.61*
GROUP D	47.31*
GROUP E	47.86*
GROUP F	48.86*
GROUP G	47.61*
GROUP H	48.23*
GROUP HH	48.61*
GROUP I	48.36*
GROUP II	48.73*

* To calculate premium wage, subtract $ .10 from the hourly wage.

Note: Fuel truck operators on construction sites addit. $5.00 per day.
For work on hazardous/toxic waste site addit. 20% of hourly rate.

Shift Differential: When mandated by the contracting agency, DOT, or any governmental agency contracts shall receive a shift differential of fifteen (15%) above the wage rate.

NOTE: The Employer Registration (30.1) use of a '4 Day/10 Hour Work schedules' will no longer be accepted or processed. All registered projects prior to June 30,2023 will expire within the granted time frame.

For Pre-Registered Projects Four (4), Ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day. For further clarification contact your local Bureau Office.

SUPPLEMENTAL BENEFITS
Per hour:
Journeyworker

First 40 hours	$ 35.58
41st-45th hours	15.73
Over 45 hours	1.60

OVERTIME PAY
See (B, E, P, R) on OVERTIME PAGE

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

8-456

Welder — 03/01/2024

JOB DESCRIPTION Welder **DISTRICT** 1

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

WAGES
Per hour 07/01/2023

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY

HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

(AA)	Time and one half of the hourly rate after 7 and one half hours per day
(A)	Time and one half of the hourly rate after 7 hours per day
(B)	Time and one half of the hourly rate after 8 hours per day
(B1)	Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday. Double the hourly rate for all additional hours
(B2)	Time and one half of the hourly rate after 40 hours per week
(C)	Double the hourly rate after 7 hours per day
(C1)	Double the hourly rate after 7 and one half hours per day
(D)	Double the hourly rate after 8 hours per day
(D1)	Double the hourly rate after 9 hours per day
(E)	Time and one half of the hourly rate on Saturday
(E1)	Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
(E2)	Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
(E3)	Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
(E4)	Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
(E5)	Double time after 8 hours on Saturdays
(F)	Time and one half of the hourly rate on Saturday and Sunday
(G)	Time and one half of the hourly rate on Saturday and Holidays
(H)	Time and one half of the hourly rate on Saturday, Sunday, and Holidays
(I)	Time and one half of the hourly rate on Sunday
(J)	Time and one half of the hourly rate on Sunday and Holidays
(K)	Time and one half of the hourly rate on Holidays
(L)	Double the hourly rate on Saturday
(M)	Double the hourly rate on Saturday and Sunday
(N)	Double the hourly rate on Saturday and Holidays
(O)	Double the hourly rate on Saturday, Sunday, and Holidays
(P)	Double the hourly rate on Sunday
(Q)	Double the hourly rate on Sunday and Holidays
(R)	Double the hourly rate on Holidays
(S)	Two and one half times the hourly rate for Holidays

(S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.

(T) Triple the hourly rate for Holidays

(U) Four times the hourly rate for Holidays

(V) Including benefits at SAME PREMIUM as shown for overtime

(W) Time and one half for benefits on all overtime hours.

(X) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

Holiday Codes

PAID Holidays:

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

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

(1)	None
(2)	Labor Day
(3)	Memorial Day and Labor Day
(4)	Memorial Day and July 4th
(5)	Memorial Day, July 4th, and Labor Day
(6)	New Year's, Thanksgiving, and Christmas
(7)	Lincoln's Birthday, Washington's Birthday, and Veterans Day
(8)	Good Friday
(9)	Lincoln's Birthday
(10)	Washington's Birthday
(11)	Columbus Day
(12)	Election Day
(13)	Presidential Election Day
(14)	1/2 Day on Presidential Election Day
(15)	Veterans Day
(16)	Day after Thanksgiving
(17)	July 4th
(18)	1/2 Day before Christmas
(19)	1/2 Day before New Years
(20)	Thanksgiving
(21)	New Year's Day
(22)	Christmas
(23)	Day before Christmas
(24)	Day before New Year's
(25)	Presidents' Day
(26)	Martin Luther King, Jr. Day
(27)	Memorial Day
(28)	Easter Sunday

(29) Juneteenth

New York State Department of Labor - Bureau of Public Work
State Office Building Campus
Building 12 - Room 130
Albany, New York 12226

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

This Form Must Be Typed

Submitted By: (Check Only One) ☐ Contracting Agency ☐ Architect or Engineering Firm ☐ Public Work District Office Date:

A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address ☐ (Check if new or change)

Telephone Fax

E-Mail:

2. NY State Units (see Item 5).

- ☐ 01 DOT
- ☐ 02 OGS
- ☐ 03 Dormitory Authority
- ☐ 04 State University Construction Fund
- ☐ 05 Mental Hygiene Facilities Corp.
- ☐ 06 OTHER N.Y. STATE UNIT
- ☐ 07 City
- ☐ 08 Local School District
- ☐ 09 Special Local District, i.e., Fire, Sewer, Water District
- ☐ 1O Village
- ☐ 11 Town
- ☐ 12 County
- ☐ 13 Other Non-N.Y. State (Describe)

3. SEND REPLY TO ☐ (check if new or change)
Name and complete address:

Telephone Fax

E-Mail:

4. SERVICE REQUIRED. Check appropriate box and provide project information.

☐ New Schedule of Wages and Supplements.

APPROXIMATE BID DATE :

☐ Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR THIS PROJECT :

OFFICE USE ONLY

B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

_____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:
Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

- ☐ 1. New Building
- ☐ 2. Addition to Existing Structure
- ☐ 3. Heavy and Highway Construction (New and Repair)
- ☐ 4. New Sewer or Waterline
- ☐ 5. Other New Construction (Explain)
- ☐ 6. Other Reconstruction, Maintenance, Repair or Alteration
- ☐ 7. Demolition
- ☐ 8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- ☐ Construction (Building, Heavy Highway/Sewer/Water)
- ☐ Tunnel
- ☐ Residential
- ☐ Landscape Maintenance
- ☐ Elevator maintenance
- ☐ Exterminators, Fumigators
- ☐ Fire Safety Director, NYC Only
- ☐ Fuel Delivery
- ☐ Guards, Watchmen
- ☐ Janitors, Porters, Cleaners, Elevator Operators
- ☐ Moving furniture and equipment
- ☐ Trash and refuse removal
- ☐ Window cleaners
- ☐ Other (Describe)

9. Does this project comply with the Wicks Law involving separate bidding? YES ☐ NO ☐

10. Name and Title of Requester

Signature

SEE PAGE TWO FOR LAWS RELATING TO PUBLIC WORK CONTRACTS

NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE AWARDED ANY PUBLIC WORK CONTRACT

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

Debarment Database: To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: https://apps.labor.ny.gov/EDList/searchPage.do

For inquiries where WCB is listed as the "Agency", please call 1-866-546-9322

NYSDOL Bureau of Public Work Debarment List 03/01/2024

Article 8

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	DOL	*****5754	0369 CONTRACTORS, LLC		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL	*****5784	A.J.M. TRUCKING, INC.		PO BOX 2064 MONROE NY 10950	02/12/2024	02/12/2029
DOL	DOL	*****4018	ADIRONDACK BUILDING RESTORATION INC.		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	AG	*****1812	ADVANCED BUILDERS & LAND DEVELOPMENT, INC.		400 OSER AVE #2300HAUPPAUGE NY 11788	09/11/2019	09/11/2024
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	NYC		ALL COUNTY SEWER & DRAIN, INC.		7 GREENFIELD DR WARWICK NY 10990	03/25/2022	03/25/2027
DOL	NYC		AMJED PARVEZ		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		ANGELO GARCIA		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL		ANGELO TONDO		449 WEST MOMBSHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL	*****4231	ANKER'S ELECTRIC SERVICE, INC.		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	DOL		ANTHONY MONGELLI		PO BOX 2064 MONROE NY 10950	02/12/2024	02/12/2029
DOL	NYC		ARADCO CONSTRUCTION CORP		115-46 132RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL		ARNOLD A. PAOLINI		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC		ARSHAD MEHMOOD		168-42 88TH AVENUE JAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC		AVM CONSTRUCTION CORP		117-72 123RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	NYC		AZIDABEGUM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****8421	B & B DRYWALL, INC		206 WARREN AVE APT 1WHITE PLAINS NY 10603	12/14/2021	12/14/2026
DOL	DOL		BERNARD BEGLEY		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	NYC	*****2113	BHW CONTRACTING, INC.		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL	*****3627	BJB CONSTRUCTION CORP.		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	DOL	*****5078	BLACK RIVER TREE REMOVAL, LLC		29807 ANDREWS ROAD BLACK RIVER NY 13032	10/17/2023	10/17/2028
DOL	DOL	*****4512	BOB BRUNO EXCAVATING, INC		5 MORNINGSIDE DR AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		BRADLEY J SCHUKA		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL	*****4083	C.P.D. ENTERPRISES, INC		P.O BOX 281 WALDEN NY 12586	03/03/2020	03/03/2025
DOL	DOL	*****5161	CALADRI DEVELOPMENT CORP.		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	DOL	*****3391	CALI ENTERPRISES, INC.		1223 PARK STREET PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL	*****4155	CASA BUILDERS, INC.	FRIEDLANDER CONSTRUCTION	64 N PUTT CONNERS ROAD NEW PALTZ NY 12561	05/10/2023	05/10/2028
DOL	AG	*****7247	CENTURY CONCRETE CORP		2375 RAYNOR ST RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	*****0026	CHANTICLEER CONSTRUCTION LLC		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	NYC	*****2117	CHARAN ELECTRICAL ENTERPRISES		9-11 40TH AVENUE LONG ISLAND CITY NY 11101	09/26/2023	09/26/2028

NYSDOL Bureau of Public Work Debarment List 03/01/2024

Article 8

DOL	DOL		CHRISTOPHER GRECO		26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL		CHRISTOPHER PAPASTEFANOU A/K/A CHRIS PAPASTEFANOU		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		CRAIG JOHANSEN		10 SOUTH 5TH ST LOCUST VALLEY NY 11560	09/26/2022	09/26/2027
DOL	DOL	*****3228	CROSS-COUNTY LANDSCAPING AND TREE SERVICE, INC.	ROCKLAND TREE SERVICE	26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL	*****7619	DANCO CONSTRUCTION UNLIMITED INC.		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL		DANIEL ROBERT MCNALLY		7 GREENFIELD DRIVE WARWICK NY 10990	03/25/2022	03/25/2027
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2CSYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		DAVID FRIEDLANDER		64 NORTH PUTT CORNERS RD NEW PALTZ NY 12561	05/10/2023	05/10/2028
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL		DELPHI PAINTING & DECORATING CO INC		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		DINA TAYLOR		64 N PUTT CONNERS RD NEW PALTZ NY 12561	05/10/2023	05/10/2028
DOL	DOL	*****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	AG		EDWIN HUTZLER		23 NORTH HOWELLS RD BELLPORT NY 11713	08/04/2021	08/04/2026
DOL	DA		EDWIN HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	*****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	NYC	*****5917	EPOCH ELECTRICAL, INC		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2024
DOL	DOL		EUGENIUSZ "GINO" KUCHAR		195 KINGSLAND AVE BROOKLYN NY 11222	12/22/2023	12/22/2028
DOL	DOL		FAIGY LOWINGER		11 MOUNTAIN RD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DA		FREDERICK HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	NYC	*****6616	G & G MECHANICAL ENTERPRISES, LLC.		1936 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/29/2019	11/29/2024
DOL	DOL	*****2998	G.E.M. AMERICAN CONSTRUCTION CORP.		195 KINGSLAND AVE BROOKLYN NY 11222	12/22/2023	12/22/2028
DOL	DOL		GABRIEL FRASSETTI			04/10/2019	04/10/2024
DOL	NYC		GAYATRI MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DA		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DOL		GIGI SCHNECKENBURGER		261 MILL RD EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DA		GIOVANNA TRAVALJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	DA	*****0213	GORILLA CONTRACTING GROUP, LLC		505 MANHATTAN AVE WEST BABYLON NY 11704	10/05/2023	10/05/2028
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	DOL		HERBERT CLEMEN		42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL		IRENE KASELIS		32 PENNINGTON AVE WALDWICK NJ 07463	05/30/2019	05/30/2024
DOL	DOL	*****9211	J. WASE CONSTRUCTION CORP.		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		J.M.J CONSTRUCTION		151 OSTRANDER AVENUE SYRACUSE NY 13205	11/21/2022	11/21/2027
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET	12/22/2022	12/22/2027

NYSDOL Bureau of Public Work Debarment List 03/01/2024

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DOL	DOL		J.R. NELSON CONSTRUCTION		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		J.R. NELSON, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	12/12/2022	12/12/2027
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		J.R.N COMPANIES, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL	*****1147	J.R.N. CONSTRUCTION, LLC		531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JAMES J. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****7993	JBS DIRT, INC.		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL	*****2435	JEFFEL D. JOHNSON	JMJ7 AND SON	5553 CAIRNSTRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JEFFEL JOHNSON ELITE CARPENTER REMODEL AND CONSTRUCTION		C2 EVERGREEN CIRCLE LIVERPOOL NY 13090	11/21/2022	11/21/2027
DOL	DOL	*****2435	JEFFREY M. JOHNSON	JMJ7 AND SON	5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	NYC		JENNIFER GUERRERO		1936 HEMPSTEAD TURNPIKE EAST MEADOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		JIM PLAUGHER		17613 SANTE FE LINE ROAD WAYNEFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		JMJ7 & SON CONSTRUCTION, LLC		5553 CAIRNS TRAIL LIVERPOOL NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 AND SONS CONTRACTORS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS		7014 13TH AVENUE BROOKLYN NY 11228	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS AND SONS		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JMJ7 CONTRACTORS, LLC		5553 CAIRNS TRAIL CLAY NY 13041	11/21/2022	11/21/2027
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		JOHN MARKOVIC		47 MANDON TERRACE HAWTHORN NJ 07506	03/29/2021	03/29/2026
DOL	DOL		JOHN WASE		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		JORGE RAMOS		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	DOL		JOSEPH K. SALERNO		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL		JOSEPH K. SALERNO II		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026

NYSDOL Bureau of Public Work Debarment List 03/01/2024

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DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		JRN CONSTRUCTION CO, LLC		1024 BROADWAY ALBANY NY 12204	11/07/2023	11/07/2028
DOL	DOL	*****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL	*****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL	*****1147	JRN CONSTRUCTION, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		JRN PAVING, LLC		531 THIRD STREET ALBANY NY 12206	11/07/2023	11/07/2028
DOL	DOL		JULIUS AND GITA BEHREND		5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002
DOL	DOL		KARIN MANGIN		796 PHELPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	DOL		KATE E. CONNOR		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KEAN INDUSTRIES, LLC		2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	DOL	*****2959	KELC DEVELOPMENT, INC		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KIMBERLY F. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL		KMA GROUP II, INC.		29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028
DOL	DOL	*****1833	KMA GROUP INC.		29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028
DOL	DOL		KMA INSULATION, INC.		29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028
DOL	DOL		KRIN HEINEMANN		2345 ROUTE 52, SUITE 2N HOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	NYC		KULWANT S. DEOL		9-11 40TH AVENUE LONG ISLAND CITY NY 11101	09/26/2023	09/26/2028
DOL	DA	*****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL		LEROY E. NELSON JR		531 THIRD ST ALBANY NY 12206	10/25/2022	10/25/2027
DOL	DOL		LEROY E. NELSON JR		531 THIRD ST ALBANY NY 12206	12/22/2022	12/22/2027
DOL	DOL		LEROY E. NELSON JR		531 THIRD ST ALBANY NY 12206	11/07/2023	11/07/2028
DOL	AG	*****3291	LINTECH ELECTRIC, INC.		3006 TILDEN AVE BROOKLYN NY 11226	02/16/2022	02/16/2027
DOL	DOL		LOUIS A. CALICCHIA		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		LUBOMIR PETER SVOBODA		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL	*****2196	MAINSTREAM SPECIALTIES, INC.		11 OLD TOWN RD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DA		MANUEL P TOBIO		150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	DA		MANUEL TOBIO		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	NYC		MARIA NUBILE		84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DOL		MATTHEW P. KILGORE		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	DOL	*****4829	MILESTONE ENVIRONMENTAL CORPORATION		704 GINESI DRIVE SUITE 29MORGANVILLE NJ 07751	04/10/2019	04/10/2024
DOL	NYC	*****9926	MILLENNIUM FIRE PROTECTION, LLC		325 W. 38TH STREET SUITE 204NEW YORK NY	11/14/2019	11/14/2024

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DOL	NYC	*****0627	MILLENNIUM FIRE SERVICES, LLC		14 NEW DROP LNE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	DOL	*****1320	MJC MASON CONTRACTING, INC.		42 FOWLER AVENUE CORTLAND MANOR NY 10567	10/25/2022	10/25/2027
DOL	DOL	*****1320	MJC MASON CONTRACTING, INC.		42 FOWLER AVENUE CORTLAND MANOR NY 10567	01/24/2023	01/24/2028
DOL	NYC		MUHAMMED A. HASHEM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	NYC		NAMOW, INC.		84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DOL	*****7790	NATIONAL BUILDING & RESTORATION CORP		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	DOL	*****1797	NATIONAL CONSTRUCTION SERVICES, INC		1010 TILDEN AVE UTICA NY 13501	07/24/2023	07/24/2028
DOL	NYC		NAVIT SINGH		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		NELCO CONTRACTING, LLC		1024 BROADWAY ALBANY NY 12204	11/07/2023	11/07/2028
DOL	DA		NICHOLAS T. ANALITIS		505 MANHATTAN AVE WEST BABYLON NY 11704	10/05/2023	10/05/2028
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	11/15/2022	11/15/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	*****7429	NICOLAE I. BARBIR	BESTUCCO CONSTRUCTION, INC.	444 SCHANTZ ROAD ALLENTOWN PA 18104	09/17/2020	09/17/2025
DOL	NYC	*****5643	NYC LINE CONTRACTORS, INC.		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		PATRICK PENNACCHIO		2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	DOL		PATRICK PENNACCHIO		2345 RT. 52 SUITE 2NHOPEWELL JUNCTION NY 12533	12/18/2023	12/18/2028
DOL	DOL		PAULINE CHAHALES		935 S LAKE BLVD MAHOPAC NY 10541	03/02/2021	03/02/2026
DOL	DOL		PETER STEVENS		11 OLD TOWN ROAD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DOL		PETER STEVENS		8269 21ST ST BELLEROSE NY 11426	12/22/2022	12/22/2027
DOL	DOL	*****0466	PRECISION BUILT FENCES, INC.		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC		RASHEL CONSTRUCTION CORP		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****1068	RATH MECHANICAL CONTRACTORS, INC.		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL	*****2633	RAW POWER ELECTRIC CORP.		3 PARK CIRCLE MIDDLETOWN NY 10940	07/11/2022	07/11/2027
DOL	DA	*****7559	REGAL CONTRACTING INC.		24 WOODBINE AVE NORTHPORT NY 11768	10/01/2020	10/01/2025
DOL	DOL		RICHARD REGGIO		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	DOL		ROBBYE BISSESAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003
DOL	DOL		ROBERT A. VALERINO		3841 LANYARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		ROBERT BRUNO		5 MORNINGSIDE DRIVE AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	07/11/2022	07/11/2027
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	*****7172	RZ & AL INC.		198 RIDGE AVENUE VALLEY STREAM NY 11581	06/06/2022	06/06/2027
DOL	DOL	*****1365	S & L PAINTING, INC.		11 MOUNTAIN ROAD P.O BOX 408MONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL		SAL FRESINA MASONRY		1935 TEALL AVENUE	07/16/2021	07/16/2026

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DOL	DOL		SAL MASONRY CONTRACTORS, INC.		(SEE COMMENTS) SYRACUSE NY 13202	07/16/2021	07/16/2026
DOL	DOL	*****9874	SALFREE ENTERPRISES INC		P.O BOX 14 2821 GARDNER RDPOMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		SALVATORE A FRESINA A/K/A SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	DOL		SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	NYC	*****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	DA	*****0476	SAMCO ELECTRIC CORP.		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	NYC	*****1130	SCANA CONSTRUCTION CORP.		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL	*****2045	SCOTT DUFFIE	DUFFIE'S ELECTRIC, INC.	P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	DOL		SCOTT DUFFIE		P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	DOL		SHULEM LOWINGER		11 MOUNTAIN ROAD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DA		SILVANO TRAVALJA		3735 9TH ST LONG ISLAND CITY NY 11101	01/05/2023	01/05/2028
DOL	DOL	*****0440	SOLAR GUYS INC.		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	NYC		SOMATIE RAMSUNAHAI		115-46 132ND ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL	*****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC	*****3661	SPANIER BUILDING MAINTENANCE CORP		200 OAK DRIVE SYOSSET NY 11791	03/14/2022	03/14/2027
DOL	DOL		STANADOS KALOGELAS		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL	*****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL	*****6844	STEAM PLANT AND CHX SYSTEMS INC.		14B COMMERCIAL AVENUE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	*****9933	STEED GENERAL CONTRACTORS, INC.		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	*****9528	STEEL-IT, LLC.		17613 SANTE FE LINE ROAD WAYNESFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		STEFANOS PAPASTEFANOU, JR. A/K/A STEVE PAPASTEFANOU, JR.		256 WEST SADDLE RIVER RD UPPER SADDLE RIVER NJ 07458	05/30/2019	05/30/2024
DOL	DOL	*****3800	SUBURBAN RESTORATION CO. INC.		5-10 BANTA PLACE FAIR LAWN PLACE NJ 07410	03/29/2021	03/29/2026
DOL	DOL	*****9150	SURGE INC.		8269 21ST STREET BELLEROSE NY 11426	12/22/2022	12/22/2027
DOL	DOL		SYED RAZA		198 RIDGE AVENUE NY 11581	06/06/2022	06/06/2027
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL	*****9733	TERSAL CONSTRUCTION SERVICES INC		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13208	07/16/2021	07/16/2026
DOL	DOL		TERSAL CONTRACTORS, INC.		221 GARDNER RD P.O BOX 14POMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		TERSAL DEVELOPMENT CORP.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL	*****5766	THE COKER CORPORATION	COKER CORPORATIO N	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		TIMOTHY PERCY		29807 ANDREWS ROAD BLACK RIVER NY 13612	10/17/2023	10/17/2028
DOL	DA	*****1050	TRI STATE CONSTRUCTION OF NY CORP.		50-39 175TH PLACE FRESH MEADOWS NY 11365	03/28/2022	03/28/2027
DOL	DA	*****4106	TRIPLE H CONCRETE CORP		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	*****8210	UPSTATE CONCRETE & MASONRY CONTRACTING CO INC.		449 WEST MOMBSHA ROAD MONROE NY 10950	06/06/2022	06/06/2027

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DOL	DOL	*****6418	VALHALLA CONSTRUCTION, LLC.		796 PHLEPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	NYC	*****2426	VICKRAM MANGRU	VICK CONSTRUCTION	21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	NYC		VICKRAM MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC	*****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL	*****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL	*****8266	WILLIAM CHRIS MCCLENDON	MCCLENDON ASPHALT PAVING	1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM CHRIS MCCLENDON		1646 FALLS STREET NIAGARA FALLS NY 14303	05/01/2023	05/01/2028
DOL	DOL		WILLIAM G. PROERFRIEDT		85 SPRUCEWOOD ROAD WEST BABYLON NY 11704	01/19/2021	01/19/2026
DOL	DOL	*****5924	WILLIAM G. PROPHY, LLC	WGP CONTRACTING, INC.	54 PENTAQUIT AVE BAYSHORE NY 11706	01/19/2021	01/19/2026
DOL	DOL		XENOFON EFTHIMIADIS		29-10 38TH AVENUE LONG ISLAND CITY NY 11101	10/11/2023	10/11/2028

TECHNICAL SPECIFICATIONS

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

Division of Engineering

ITEM 205. 97200011 - TESTING, HANDLING AND DISPOSAL OF CONTAMINATED DEWATERING FLUIDS

DESCRIPTION:

Collect, test, handle and properly dispose, or discharge to the local sewer/stormwater system contaminated sub-surface water that requires dewatering during project construction/excavation. The contamination present in sub-surface waters may include, but is not limited to: gasoline, heating oils, kerosene, diesel fuel, jet fuel, lubricating oils, motor oils, greases, polychlorinated bi-phenyls (PCBs), and/or heavy metals. Collect and analyze water as required by the entity or agency governing/owning the disposal facility, or wastewater infrastructure. Conduct all tasks associated with these items in accordance with all Federal, State, County, and local regulations.

MATERIALS:

Furnish all materials and equipment required to properly collect, handle, filter/treat and dispose of contaminated water.

The Contractor may need to furnish the following to satisfy the requirements:

- Storage tanks or drums of sufficient capacity to store the water collected while awaiting disposal.
  Containers must be non-leaking and prevent the potential for spills.
- All equipment and supplies needed to pump or otherwise collect, store, sample, and/or otherwise handle contaminated water.

CONSTRUCTION DETAILS:

I. Advance Preparation

At least 30 days prior to commencing work in the areas requiring dewatering, prepare and submit the following information to the EIC for review and approval:

1. Identify the proposed treatment/disposal facilities to include: facility name, address, and contact person;
2. Any required permits and/or approvals that must be obtained for local discharge;
3. Identify any intended or required on-site treatment. The types and intended storage locations of any storage tanks/drums/ equipment;
4. For any transportation off-site, the identification of and information on the proposed waste transporter to include: name, address, telephone number, contact person, and EPA and NYS Transporter ID number; and
5. Name, address, and telephone number of the proposed laboratory for analysis of water samples.

II. Material Handling and Disposal

At least 30 days prior to commencing work the contractor shall provide a material handling plan. This plan shall stipulate provisions for dewatering, pumping, filtering or otherwise treating as necessary, collection, temporary storage, and discharge or disposal of contaminated water to:

1. County or City sewer/stormwater system, if approved;
2. A wastewater treatment plant if disposal has been approved by the wastewater treatment plant;
3. A water body discharge point with a valid SPDES (State Pollutant Discharge Elimination System) permit if discharge complies with all permit conditions, stipulation agreements, or as otherwise approved by the New York State Department of Environmental Conservation; and/or
4. Other permitted facilities.

ITEM 205. 97200011 - TESTING, HANDLING AND DISPOSAL OF CONTAMINATED DEWATERING FLUIDS

For any on-site storage, label any containers and tanks identifying the contents and its generation date. Inspect stored materials at least weekly for any leakage and/or deterioration and immediately implement any needed corrective actions.

If stored, dispose of all contaminated materials within 30 days of collection or within 30 days of the results of any required laboratory analysis, whichever is later, unless additional time is approved by the EIC. Do not dispose or discharge any fluids prior to the receipt of the laboratory results by the EIC.

III. Sampling and Laboratory Analysis

This work shall include collecting water samples and arranging for samples to be analyzed at a laboratory for parameters as required by State, County, or City discharge permits, or the disposal facility. Samples shall be collected and analysis completed prior to any discharging activities. Perform all analyses at a laboratory approved by the New York State Department of Health Environmental Laboratory Approval Program (ELAP) for the intended analyses. Provide a copy of the analysis results to the EIC within 24 hours of receipt. The results of the laboratory analysis will determine or confirm the final regulatory classification of the water for appropriate handling, transportation, treatment and disposal methods and requirements. No discharge or disposal shall occur prior to the EIC's receipt and acceptance of laboratory reports.

IV. Transportation Off Site

For any off-site transportation of wastewater, load and transport wastewater in vehicles with a valid 6 NYCRR Part 364 Waste Transporter Permit (and permits for any other jurisdiction as applicable). Verify and document that the transporter has a current waste transporter's permit authorizing the transport of the project waste materials to the approved off-site facility. Complete any required shipping papers, placarding, labeling, manifests, and weighing/load measurements and provide documentation/copies to the EIC. Verify that any trucks/tankers are not leaking. Do not combine fluids from any other source other than from the Project Site. No payment for this item shall be made until proper documentation of disposal is received by the EIC.

BASIS FOR ACCEPTANCE:

Submission of evidence that all contaminated water has been handled and disposed/discharged in accordance with Federal, State and local regulations, and applicable permits will be the basis of acceptance for work completion.

METHOD OF MEASUREMENT:

This work will be measured on a Lump Sum basis.

BASIS OF PAYMENT:

The lump sum bid shall include the cost of furnishing all labor, materials, equipment, transportation, pumping, storage, discharge or disposal, sampling and analysis, documentation, permits, and any other incidentals necessary to complete the work.

ITEM 209.20XX0009 – BIODEGRADABLE BIO-FIBER ROLLS

DESCRIPTION
This work shall consist of furnishing and installing biodegradable bio-fiber rolls in accordance with the contract documents and as directed by the Engineer.

MATERIALS
The following sections of the standard specifications shall apply:

Bank and Channel Protection	620-2

The rolls shall have
- a density of 9 lb./ft^3
- exterior 2-inch knotted mesh netting that is 100% coir fiber mesh material
- interior material that is 100% coconut fiber.

Other biodegradable material may be acceptable as specified in the contract documents or as approved. Compost fill will **NOT** be accepted. The entire Bio-Fiber Roll shall be 100% biodegradable.

Stone material, if used, shall conform to §620-2.02.

Posts shall be per §209-2.05 B. 1. Post height shall be per §209-2.05 B. 1 or manufacturer's instructions, whichever is greater.

CONSTRUCTION DETAILS
The following sections of the standard specifications shall apply:

Planting, Transplanting and Post-Planting Care	611-3

Installation:
Biodegradable bio-fiber rolls – including posts - shall be installed according to manufacturer's instructions, or as specified in the contract documents.

When erosion control blanket material is used in conjunction with the bio-fiber rolls to cover the slopes of disturbed banks, the Contractor shall staple the fabric to the back of the bio-fiber roll.

Maintenance:
The Contractor shall be responsible for maintaining the bio-fiber rolls installation for the duration of the contract and thru the period of establishment of those plantings put into the roll as specified under §611-3.05 Post Planting Care.

METHOD OF MEASUREMENT
This work will be measured as the number of linear feet of biodegradable bio-fiber rolls installed.

ITEM 209.20XX0009 – BIODEGRADABLE BIO-FIBER ROLLS

BASIS OF PAYMENT

The unit price bid per linear foot of biodegradable bio-fiber rolls furnished and installed shall include the cost of furnishing all labor, material, and equipment necessary to satisfactorily complete the work.

Where XX is the diameter of the bio-fiber roll in inches.

ITEM 304.10119917 - SUBBASE COURSE, TYPE 1011-2

All of the requirements of Section 304 *Subbase Course* shall apply except as herein modified:

MATERIALS

Material shall conform to the requirements of §733-04 *Subbase Course* with the addition of the following requirement:

Natural Material. Natural material obtained from sources located in Richmond, Kings, Queens, Nassau and Suffolk Counties shall conform to the following gradation:

Sieve Size Designation	Percentage Passing by Weight
2 in.	100
1 in.	80-100
¼ in.	50-85
No. 10	30-70
No. 40	15-40
No. 200	6-12

Natural material obtained from sources other than those listed above shall conform to the gradation requirements of Table 733-04A *Subbase Gradation* in §733-04B. *Gradation.*

BASIS OF PAYMENT

Payment will be made under:

Item No.	Item	Pay Unit
304.10119917	Subbase Course, Type 1011-2	Cubic Yard

11/08/99
3/4/10 (EI 10-014)

ITEM 520.09000010 - SAW CUTTING ASPHALT CONCRETE

DESCRIPTION. This work shall consist of saw cutting existing asphalt concrete pavement or sidewalk at the locations indicated on the plans or where directed by the Engineer.

MATERIALS. All equipment proposed for this work shall be approved by the Engineer prior to actual use.

CONSTRUCTION DETAILS. Saw cutting shall be along a neat line as indicated on the plans or where directed by the Engineer. Saw cuts shall be made to the depth(s) indicated on the plans.

Any damage to material not indicated for removal, caused by the Contractor's operations shall be repaired by the Contractor. All repair shall be done in a manner satisfactory to the Engineer.

METHOD OF MEASUREMENT. This work will be measured by the number of linear feet of saw cutting done. No allowances will be made for saw cuts of different depths.

No saw cutting will be measured for payment under this item which the Contractor may choose to do for his own convenience.

BASIS OF PAYMENT. The unit price bid per linear foot of saw cutting shall include the cost of all labor, materials, and equipment necessary to complete the work.

Any repairs made necessary by the Contractor's operations shall be done to the satisfaction of the Engineer at no additional cost to the State.

ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

DESCRIPTION: Install injection ports, seal the crack opening, inject the crack with epoxy (full depth for restoration work, or as deep as conditions allow for prevention work), and restore the sealed surface to a flush condition in areas visible to the public. Perform the work at locations indicated on the contract plans or where directed by the Engineer.

PREVENTION - use in contaminated, cracked concrete areas to prevent movement and protect reinforcing.

RESTORATION - use in uncontaminated cracked concrete areas to restore structural integrity. Take verification cores for payment. Have an experienced epoxy manufacturer representative present until the work is acceptable to the Engineer.

MATERIAL REQUIREMENTS:

1. Crack Sealant - epoxy paste that completely cures in 4 hours or less and retains the injected epoxy. Any other type of crack sealant is subject to a project demonstration and approval by the Engineer.

2. Low Viscosity Injection Epoxy - Manufacturer certified to meet ASTM C881, Type I or IV, Grade 1, Class B or C (as temperature conditions require.)

3. Vertical & Overhead Patching Material (Approved List) - (for ITEM 555.80020001) §701-08

INJECTION EQUIPMENT: Use equipment in good working order, as approved by the Engineer, with the following features:

- Separate feed lines to the mixing chamber
- Automatic mixing and metering pump
- Ability to thoroughly mix the epoxy components in the mixing chamber
- Operator control of the epoxy flow from the mixing chamber
- Clean, legible, accurate pressure gauges easily viewable by the operator
- Ability to provide an uninterrupted pressure head to continually force epoxy into the cracks
- Injection pressure from 0 to at least 200 PSI
- Capable of metering each epoxy component to within 3.0% of the epoxy manufacturer's mix ratio

Un-reacted epoxy components may be stored overnight in separate reservoirs and feed lines.

Before starting the work, demonstrate to the Engineer the ability of the equipment to meter and mix epoxy components to the required mix ratio. Ratio accuracy may be determined by simultaneously metering each component into separate, clean, accurately graduated, volumetric containers, or another procedure approved by the Engineer. Also, activate the automatic mixing and metering pump, mix a small amount of injection epoxy, and waste it into a disposable container. The Engineer will observe this trial operation and be satisfied the equipment is working properly, and the epoxy is mixed with no streaks.

CONSTRUCTION DETAILS:

ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

1. Crack and Surface Preparation. Remove all debris or contaminants accessible within the cracks by using hand tools, water blasting or oil-free high pressure air blasting, vacuuming, or other methods suitable to the Engineer. Epoxy resin will not penetrate: compacted, water or oil soaked debris. Allow free moisture within the crack to be absorbed before injecting epoxy. Remove all materials, including moisture, from the surface adjacent to the crack which might interfere with bonding of the crack sealant.

2. Injection Port Installation. Attach injection ports to the prepared surface by placing them onto (surface adapters) or into the cracks (socket ports) and affixing with crack sealant. Larger cracks may be ported by inserting an anchored tube into the crack.

   Use positive connection port designs to connect injection equipment to the ports. Other injection port designs and attachment methods, where worker fatigue would not be a problem, require approval by the Engineer.

   Use the following general guidelines for spacing injection ports when cracks are uniform in width through the structure. For cracks that get tighter with depth, double this spacing. Intermediate ports may be placed for observation. To permit maximum flow into the void, position ports on the wider crack sections and at intersections, rather than at an exact spacing.

   If these guidelines cannot be followed, use port locations approved by the Engineer. Port spacing may be modified by the Engineer as experience is gained, or when cores are taken to determine penetration.

   FOR CRACKS COMPLETELY THROUGH A MEMBER

   A. Cracks accessible from one side - space the ports not less than the thickness of the member.

   B. Cracks accessible from both sides - space the ports not less than twice the thickness of the member and stagger them relative to the ports on the opposite side. Make the stagger between ports (on opposite sides of the member) at least the thickness of the member.

   Place the endmost ports at the ends of the crack so as to insure complete filling of the crack.

   FOR MULTIPLE CRACKS ALL OVER A MEMBER.
   Space the ports as far apart as practical, but not less than 8" from one another. An 8" spacing presumes a 4" penetration in each direction, if the adjacent ports are not plugged when epoxy reaches them. For fine cracks that taper to an end, place the endmost ports about 4" from the end.

3. Crack Seal. After port installation, seal the crack opening with crack sealant, being careful not to plug the injection ports. Allow the crack sealant to cure completely before injecting epoxy.

   Apply crack sealant only when surface and ambient temperatures are above 50° F.

4. Port Flushing. Prior to any epoxy injection, flush critical ports with oil-free compressed air to verify that air exits from all the installed ports, dry the cracks, and check for leaks.

5. Epoxy Injection. Perform epoxy injection only when the surface and ambient temperatures are above 45° F and are not expected to fall below 45° F during the next 24 hours.

   UNIFORM WIDTH CRACKS - start toward the middle of a horizontal crack and work outward, or the lowest point of a sloping or vertical crack and work upward.

   VARIABLE WIDTH CRACKS - start at the widest points of all types of cracks and work outward. Secure the feed line to the first port. Initiate and continue flow until epoxy exits from the adjacent port. (Plug observation ports and continue through the same port to achieve maximum penetration.) Temporarily stop the injection process, remove the feed line, and seal the port. Attach the feed line to the adjacent port and repeat this procedure along the crack until the last port is sealed.

   Generally, use higher pressures when injecting narrow deep cracks, medium to low for wider cracks, and lowest pressures when injecting a delaminated area or an area susceptible to lifting. Low pressure applied for a longer duration is often more effective than high pressure applied for a shorter duration.

   Replenish the epoxy supply in the mixing equipment before it is exhausted. Thoroughly stir each epoxy component both before and after adding it to its respective component in the mixing equipment. Exercise care to assure a continuous injection operation.

   Allow the epoxy to fully cure prior to performing subsequent work in the repaired area.

   In the event of leakage from a crack, stop the injection process until the leak is sealed. When any work stoppage exceeds 15 minutes, clean the mixing chamber and flush the line that carries mixed epoxy. Flush with a suitable solvent, followed by air.

6. For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), take cores ranging in diameter from 1 to 4", as approved by the Engineer, to verify full penetration by epoxy and its cure. Take a representative core from each structural element, or one from every 100 feet of crack repaired, whichever is greater, at locations approved by the Engineer. The Engineer will retain the cores and determine if they are acceptable for payment. Patch the holes with Vertical & Overhead Patching Material.

   More than one core may be necessary to obtain an acceptable sample from cracks that diverge below the surface. (To avoid cutting reinforcing, the core drill may be angled to intercept a crack behind the reinforcing.)

7. Clean Up. In all areas visible to the public, as determined by the Engineer, remove spillage, the ports and crack sealant until flush with the adjacent surface. Remove stains and repair any damage to the satisfaction of the Engineer at no additional cost.

ITEM 555.80010001 - CRACK SEALING BY EPOXY INJECTION (PREVENTION)
ITEM 555.80020001 - CRACK REPAIR BY EPOXY INJECTION (RESTORATION)

METHOD OF MEASUREMENT: The Engineer will measure the work as the number of linear feet of crack sealed or repaired, as specified.

BASIS OF PAYMENT: Include the cost of all labor, materials, and equipment necessary to complete the work in the unit price bid per linear foot. For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), also include the cost of coring and repairing the core holes.

For ITEM 555.80010001 CRACK SEALING BY EPOXY INJECTION (PREVENTION), the Engineer will authorize payment after the measured length of crack has been sealed and the surface cleaned.

For ITEM 555.80020001 CRACK REPAIR BY EPOXY INJECTION (RESTORATION), the Engineer will authorize payment after the measured length of crack has been repaired as verified by cores, the core holes patched and the surface cleaned.

ITEM 555.81980011 - CRACK REPAIR (1/8 of an inch or wider) BY INJECTION OF PORTLAND CEMENT GROUT

DESCRIPTION

Install injection ports, seal the crack opening, inject the crack with grout, and restore the sealed surface to a flush condition in areas visible to the public. Perform the work at locations indicated on the contract plans or where directed by the Engineer.

MATERIAL REQUIREMENTS

A. Crack Sealant - epoxy paste that completely cures in 4 hours or less and retains the injected grout. Any other type of crack sealant is subject to a project demonstration and approval by the Engineer.

B. Portland Cement Grout Ingredients.

Portland Cement, Type II	§701-01
Fly Ash (Type F)	§711-10
Microsilica	§711-11
Grout Sand	§703-04
Water	§712-01
Admixtures	§711-08
Expansive Agent	-

Include an air entraining admixture to create 5 - 15% air entrainment. If an expansive agent is used, use a maximum 1%, by weight of cementitious material, and eliminate any air entraining admixture.

Cracks 1/8 to 1/4 of an inch. Design a grout (portland cement, water and admixtures) with a minimal water content that will fill and flow throughout the crack. Up to 25% by loose volume of the portland cement may be replaced, in combination or alone, as follows:

Fly Ash	0 to 25%
Microsilica	0 to 10%

Cracks 1/4 **of an inch wide and wider.** Use a loose volume ratio of 1 part cementitious material (portland cement, fly ash, microsilica) to 1 - 3 parts grout sand.

Perform mix trials to select a suitable grout for the application. When the repairs will be visible to the public, match the color of the repair to the adjacent material, to the satisfaction of the Engineer.

Demonstrate that the grout to be used flows satisfactorily through an installed injection port.

EQUIPMENT

Use only equipment in good working order, as approved by the Engineer.

A. High Speed Colloidal Mixer – provide a machine operated high speed colloidal mixer that operates in the range of 800 to 2000 revolutions per minute.

B. Positive Displacement Pump - to maintain a consistent pressure (from 0 to 51 lb) to uniformly force grout into the cracks

ITEM 555.81980011 - CRACK REPAIR (1/8 of an inch or wider) BY INJECTION OF PORTLAND CEMENT GROUT

CONSTRUCTION DETAILS

A. Crack and Surface Preparation. Remove all debris or contaminants accessible within the cracks by using hand tools, water blasting or oil-free high pressure air blasting, vacuuming, or other methods suitable to the Engineer. Remove all materials, including moisture, from the surface adjacent to the crack which might interfere with crack sealant bonding.

B. Injection Port Installation. Attach injection ports to the prepared surface by placing them onto (surface adapters) or into the cracks (socket ports) and affixing with crack sealant. Larger cracks may be ported by inserting an anchored tube into the crack. Other injection port designs and attachment methods require approval by the Engineer.

For cracks uniform in width, use injection port spacing sufficient to completely fill the crack. For cracks that get tighter with depth, double the injection port spacing. Intermediate ports may be placed for observation. To permit maximum flow into the void, position ports on the wider crack sections and at intersections, rather than at an exact spacing. Port spacing may be modified by the Engineer as experience is gained.

FOR CRACKS COMPLETELY THROUGH A MEMBER:

1. Cracks accessible from one side - space the ports not less than the thickness of the member.

2. Cracks accessible from both sides - space the ports not less than twice the thickness of the member and stagger them relative to the ports on the opposite side. Make the stagger between ports (on opposite sides of the member) at least the thickness of the member.

Place the endmost ports at the ends of the crack so as to insure complete filling of the crack.

FOR MULTIPLE CRACKS ALL OVER A MEMBER:
Space the ports as far apart as practical, but not less than 8 inch from one another. An 8-inch spacing presumes a 4 inch penetration in each direction, if the adjacent ports are not plugged when grout reaches them. For cracks that taper to an end, place the endmost ports about 4 inches from the end.

C. Crack Seal. After the ports have been installed, seal the crack opening with crack sealant, being careful not to plug the injection ports. Allow the crack sealant to cure completely before injecting grout.

Apply crack sealant when surface and ambient temperatures are above 50°F.

D. Water Flush. Prior to any grout injection, flush the crack with pressurized water using the grout injection procedure, or a similar procedure, to clean out any remaining debris, verify that water exits from all the installed ports, check for leaks, and dampen the walls of the crack. The Engineer will decide if this procedure is unsuitable for a particular crack.

E. Grout Injection. Perform grout injection only when the surface and ambient temperatures are above 45°F and are not expected to fall below 45°F during the next 24 hours.

UNIFORM WIDTH CRACKS - start toward the middle of a horizontal crack and work outward, or the lowest point of a sloping or vertical crack and work upward.

VARIABLE WIDTH CRACKS - start at the widest points of all types of cracks and work outward. Secure the feed line to the first port. Initiate and continue flow until grout exits from the adjacent port. (Plug observation ports and continue through the same port to achieve maximum penetration.)

Temporarily stop the injection process, remove the feed line, and seal the port. Attach the feed line to the adjacent port and repeat this procedure along the crack until the last port is sealed.

Generally, use higher pressures when injecting narrow deep cracks, medium to low for wider cracks, and lowest pressures when injecting a delaminated area or an area susceptible to lifting. Low pressure applied for a longer duration is more effective than high pressure applied for a shorter duration.

Exercise care to assure a continuous injection operation. In the event of leakage from a crack, stop the injection process until the leak is sealed.

Allow the grout to fully cure prior to performing subsequent work in the repaired area.

F. Verification. Take a minimum of 2 cores for each days work to verify acceptability of the injection operation. Takel or 2 inch cores, at locations mid-way between injection ports, to a depth of at least 6 inches. The Engineer will verify acceptability of the injection operation before progressing with other crack repair operations. Coring frequency may be reduced if acceptable injection operations occur routinely, as determined by the Engineer.

G. Clean Up. In all areas visible to the public, remove spillage, the ports and crack sealant until flush with the adjacent surface. Remove stains and repair any damage to the satisfaction of the Engineer at no additional cost.

METHOD OF MEASUREMENT:

The Engineer will measure the work as the number of linear feet of crack repaired as required.

BASIS OF PAYMENT:

Include the cost of all labor, materials, and equipment necessary to complete the work in the price bid per linear foot.

The Engineer will authorize payment after the measured length of crack has been repaired, and surface cleaned, as required.

ITEM 557.32000018 LIGHTWEIGHT, HIGH- PERFORMANCE CONCRETE FOR THIN STRUCTURAL APPLICATIONS

DESCRIPTION. Prepare the surface and place lightweight high-performance concrete for thin structural applications. Limit the depth of placement to $1^1/_2$ – 5 inches.

MATERIAL REQUIREMENTS. Use materials meeting §557-2. Manufacture lightweight high-performance concrete according to §501, and the following modifications:

A. Design. Design a lightweight high-performance concrete mixture, proportioned according to the American Concrete Institute Manual of Concrete Practice, ACI 211.2, Standard Practice for Selecting Proportions for Structural Lightweight Concrete.

1. Produce a homogeneous mixture of cement, pozzolan (Fly ash or GGBFS), microsilica, fine aggregate, lightweight coarse aggregate, air entraining agent, normal range set-retarding water-reducing admixture, and water as designed.

2. Use Type I, I/II II (§701-01) or Type SF (§ 701-03) cement. Use a minimum cementitious content of 675 lb/yd³. Use 15-20% pozzolan (§711-10, Fly ash or §711-12, GGBFS) and 6-10% microsilica (§711-11).

3. Use lightweight coarse aggregate conforming to §703-10, with a gradation in the 3/8" to #8 size designation in ASTM C330, Table 1.

4. Determine the cement content for each trial batch by means of a yield test according to ASTM C138.

a. At least 10 working days prior to concrete placement, provide the Materials Engineer with a copy of the trial mix design with the following data.

- Fine and coarse aggregate (saturated surface dry condition) content in lb/yd³.
- Cement content in lb/yd³.
- Water content in lb/yd³.
- Unit weight of freshly mixed concrete in accordance with ASTM C138.
- Dry unit weight in accordance with ASTM C567.
- 28 day compressive strengths.
- Batch quantities of all materials as they will appear on the batch record.

b. The Materials Engineer, or their representative, will approve the batch quantities prior to use. Use these values to manufacture all lightweight concrete for this project, and periodically correct the batch weights to account for changes in the fine aggregate fineness modulus and aggregate moisture contents in accordance with Material Method 9.1, or current Department directives.

B. Stockpile Handling. Construct lightweight aggregate stockpile(s) so as to maintain uniform moisture throughout the pile. Continuously and uniformly sprinkle the stockpile(s) with water using a sprinkler system approved by the Materials Engineer. Soak for a minimum of 48 hours, or until the stockpile has achieved a minimum internal moisture content of 15% by weight. If a steady rain of comparable intensity occurs, turn off the sprinkler system. At the end of the wetting period, or after the rain ceases, allow stockpiles to drain for 12 to 15 hours immediately prior to use.

C. Sampling of Materials. The Materials Engineer's representative, will take a 1 quart sample of microsilica in accordance with Materials Method 9.1, or current Department directives, for each day's placement for testing. Sampling of other materials will be at the direction of the Regional Materials Engineer.

D. Batching. After the materials have been accepted for this work, determine the proportions for concrete and equivalent batch weights based on trials made with materials to be used in the work.

• If microsilica is added independently - weigh cumulatively in the following order: cement, fly ash (or GGBFS) and microsilica. Base the batching tolerance of ±0.5% on the total weight of cementitious material, for each material draw weight.

• If microsilica is used as part of a blended cement - weigh cumulatively in the following order: blended cement and fly ash (or GGBFS). Base the batching tolerance of ±1% on the total weight of cementitious material, for each material draw weight.

E. Compressive Strength Determination. Achieve an average compression strength of 3600 psi, or greater, with no individual cylinder compressive strength less than 3000 psi.

F. Density Determination. Produce concrete with an average dry unit weight ranging from 110 to 115 lb/ft^3 when tested in accordance with ASTM C567.

CONSTRUCTION DETAILS.

A. Concrete Manufacturing and Transporting. Apply the provisions of §584-3 and 557-3.01 with the following modifications:

1. Use slump, unit weight and air tests as a control measure to maintain a suitable consistency. Perform slump, unit weight and air tests according to Materials Method 9.2. Determine air content by the volumetric method described in ASTM C173. Air content and slump placement limits are:

	Minimum	Desired	Maximum
Air Content (%)	5.0	6.5	8.0
Slump (inches)	$2\ ^1/_2$	$2\ ^1/_2$- $3\ ^1/_2$	4

2. If the lightweight coarse aggregate moisture content is less than saturated surface dry, introduce lightweight coarse aggregate, along with approximately 2/3 of the total mixing water, into the mixer and mix for a minimum of 10 minutes. Add the fine aggregate, admixtures, cement, fly ash (or GGBFS), microsilica, and remaining mixing water and mix completely.

3. Have the lightweight aggregate manufacturer supply a service representative at the site for the first two days of placement operations to assist in the control of lightweight concrete mixing and placement.

B. Handling, Placing and Finishing. Handle and place the lightweight concrete according to 584-3.05 except that pumping will not be permitted. Place the concrete in one lift. Finish the concrete within 10 minutes after placement. In the event a delay prevents finishing within the 10 minute time limit, stop further placement and cover the unfinished concrete with plastic curing covers. Resume placement after the ability to finish the concrete within the 10 minute time limit was been restored. Apply curing within 10 minutes after finishing. Provide uniform, continuous wetting with wet burlap for 7 days after curing has begun. In cold weather, the requirements of 557-3.12 apply.

C. Testing. Test the concrete according to Materials Method 9.2. The unit weight of the fresh concrete during placement should be compared to that which was submitted with trial mix design. Make adjustments to the concrete mix at the batching facility based on slump, unit weight and air tests. The Engineer will cast cylinders, in sets of 2 individual cylinders, at a frequency of 1 set for each 50 yd^3, or fraction thereof actually placed. A minimum of 1 set will represent each day's concrete placement.

D. Repairs. Make any repairs as per the provisions of §557-3.13. In addition, the Engineer will reject any concrete represented by a cylinder set with an average compressive strength less than 3600 psi, or an individual cylinder with a compressive strength less than 3000 psi. Proposed repairs require Deputy Chief Engineer, Structures approval.

METHOD OF MEASUREMENT. The quantity to be measured for payment will be the number of square feet satisfactorily installed, measured to the nearest square foot. No measurement will be made for slab reconstruction concrete.

BASIS OF PAYMENT. Include the cost of all labor, materials and equipment necessary to complete the work in the square foot bid price.

ITEM 560.10070008 - CLEANING OF STONE MASONRY AND CONCRETE SURFACES

DESCRIPTION:

The work shall consist of cleaning of stone masonry and concrete surfaces of graffiti, efflorescence, and any organic material. The work shall be done where indicated on the plans, or where ordered by the Engineer.

MATERIALS:

Abrasive material for blast cleaning may be selected by the contractor. All abrasives shall be free of lead. Silica sand and other types of non-metallic abrasives containing more than 1.0% free silica, by weight, will not be allowed.

All equipment shall be approved by the Engineer, prior to use.

CONSTRUCTION DETAILS:

All stone masonry and concrete surfaces to be cleaned shall be blast cleaned, or abraded by other mechanical means satisfactory to the Engineer.

The cleaning method(s) shall be demonstrated on a test area at a location determined by the Engineer.

After cleaning, surfaces shall exhibit no evidence of organic material (e.g. oil, asphalt, dirt, paint, efflorescence, etc.).

No particulate matter, of any nature, shall be permitted to remain on the cleaned surface. After cleaning the surface shall be air-blown or vacuum cleaned. Air-blowing may be used on vertical, or overhead surfaces. Vacuum cleaning shall be required for all other surfaces.

If, after cleaning is completed, the cleaned surface becomes dirty as a result of the contractor's operations, it shall be recleaned by the foregoing procedures at the expense of the contractor.

METHOD OF MEASUREMENT:

This work will be measured as the number of square feet of stone masonry and concrete surface cleaned.

BASIS OF PAYMENT:

The unit price bid per square foot shall include the cost of all labor, materials and equipment necessary to complete the work.

ITEM 560.11200007 – CONSTRUCT DRY STONE WALL

DESCRIPTION:

Under this item, the Contractor shall construct a dry stone wall at the location and to the dimensions shown on the plants or as ordered by the Engineer.

MATERIALS:

Stone shall be native limestone, granite, or sandstone, sound and durable, and of uniform quality and texture throughout. Stone shall be free from shale, excess mica, seams, scaling or evidence of disintegration. Color shall be as specified. Samples of stone representative of the full range of sizes and colors shall be submitted to the Engineer for approval prior to commencement of work.

CONSTRUCTION:

The Contractor shall construct the dry stone wall true to line and grade, and to the dimensions shown on the plans or as ordered by the Engineer.

A sample (approximate 13 ft) dry stone wall shall be constructed in order to assess pattern and workmanship to the satisfaction of the Engineer and Regional Landscape Architect. The Contractor may elect to construct the sample wall in place in anticipation of approval, in which case it may remain as a segment of the finished wall.

METHOD OF MEASUREMENT:

The quantity measured under this item will be the number of feet of dry stone wall constructed in accordance with the plans and the directions of the Engineer.

BASIS OF PAYMENT:

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work. Excavation and backfill shall be paid for separately under the appropriate items.

ITEM 560.13200007 - REMOVE AND RESET STONE WALL

DESCRIPTION:

Under this item, the Contractor shall remove the existing stone wall from its original location and reset it at the location and to the dimensions as shown on the plans or as ordered by the Engineer.

MATERIALS:

The stone used shall be the existing material from the wall being removed.

At the Contractor's option, new clean stone matching the stone within the existing stone wall as to composition, nominal size, and appearance as approved by the Engineer may be utilized to construct the reset stone wall.

Masonry Mortar Subsection 705-21

CONSTRUCTION DETAILS:

The Contractor shall carefully remove the existing stone wall as shown on the Plans or as ordered by the Engineer. All stone shall be cleaned and old mortar removed prior to reuse within the reset stone wall. The new wall shall be set true to line and to the dimensions shown on the Plans or as ordered by the Engineer. The workmanship shall duplicate that of the original installation.

METHOD OF MEASUREMENT:

The quantity to be measured under this item will be the number of feet of stone wall reset in accordance with the plans and the directions of the Engineer.

BASIS OF PAYMENT:

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work. Excavation and backfill shall be paid for separately under the appropriate items.

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ITEM 560.40000008 - REPAIR STONE MASONRY

DESCRIPTION:
The work consists of replacing missing stones and removing, cleaning and reinstalling loose stones on walls at existing structures where indicated on the contract plans.

MATERIALS:
Contractor may utilize existing stones that were previously a part of the wall and are presently on the side slopes adjacent to the structure.

Contractor shall furnish all new stones required to complete the work. New stone shall match the existing as nearly as possible in kind, texture, hardness, color and finish.

Mortar shall conform to the requirements of 560-2.06. Color of mortar shall match existing, as nearly as practicable.

CONSTRUCTION DETAILS:
Prior to any repairs, existing stones shall be thoroughly cleaned of all dirt and mortar.

Stone masonry shall not be installed when the ambient temperature is 40° F or below, or when the stone masonry units exhibit frost.

Stone masonry units shall not be dropped upon or slid over existing masonry, nor shall hammering or turning of stone masonry units on the masonry be allowed. Stone masonry units shall be carefully set without jarring masonry already laid, and they shall be handled in a manner so as not to cause damage.

Each stone shall be cleaned before being set and the bed which is to receive the masonry shall also be cleaned. Do not moisten surfaces receiving masonry mortar as excess water in masonry mortar is meant to be absorbed into dry receiving surfaces to obtain better bond.

All stone shall be well bedded in mortar and settled in place with a suitable wooden maul before the setting of the mortar.

No pinning up of stones with spalls will be permitted, and no spalls will be permitted in beds.

End of stones shall be buttered to completely fill the joint with mortar. Joints shall not be filled by pouring in a thin or liquid mortar. Tool joints in exposed faces to match existing.

METHOD OF MEASUREMENT:
This work will be measured as the number of square feet of stone masonry repaired (including mortar joints within the stone masonry) as measured on the plane of all exposed surface (including the top, inside, outside and end faces) of the stone masonry repaired.

BASIS OF PAYMENT:
The unit price bid per square foot shall cover the cost of all labor, material, equipment and incidentals necessary to complete the work.

ITEM 594.11000010 – FIBERGLASS REINFORCED PLASTIC (FRP) COMPOSITE LUMBER FOR BRIDGE FENDER

DESCRIPTION

Under this work, the Contractor shall furnish and install fiberglass reinforced plastic (FRP) composite lumber for the bridge fender system as shown on the Contract Plans and as described herein. The installed composite lumber shall be fastened as shown on plans. This work shall include all equipment, materials, labor and all else necessary to install the FRP composite lumber as shown on the plans.

The work shall also include maintaining the fender system and navigation lighting as necessary during construction; and furnishing, installing, and maintain necessary access walkways for the maintenance of navigation lights during construction.

Work shall be performed in conformance with all regulations and requirements of the U.S. Coast Guard. Navigation shall be maintained at all times, and shall not be restricted during construction except as permitted by the U.S. Coast Guard.

MATERIALS

1. Fiberglass Reinforced Plastic Composite Lumber:

   COMPOSITE LUMBER – The plastic for the lumber shall be a mixture of recycled high-density polyethylene, medium-density polyethylene and low-density polyethylene. The lumber shall meet the material property requirements specified in Table 1. The outer skin shall be smooth and black in color. It shall provide sufficient resistance to ultraviolet light degradation as to meet the requirements in Table 1.

   The lumber shall consist of a dense outer skin surrounding a less dense core. Interior voids shall not exceed 0.75" [19mm] in diameter. LUMBER shall be free of twist and curvature. Dimensions and tolerances shall be in accordance with Table 2.

   Composite lumber shall be reinforced by four (4) – 1.5" fiberglass reinforcing rods spaced inside the four corners of the member. Reinforcing rods shall be continuous and offer a minimum flexural strength of 70 ksi when tested in accordance with ASTM D4476 and a minimum compressive strength of 40 ksi when tested in accordance with ASTM D695. Lumber shall meet the structural properties (plus or minus 15%) listed in Table 3.

Table 1 – Plastic Material Properties

Density ASTM D 792	Skin	55-70 pcf
Density ASTM E12	Core	30-50 pcf
Water Absorption ASTM D 570	Skin	2 hrs: < 1.0% weight. increase 24 hrs: < 5.0% weight. increase
Brittleness ASTM D 746	Skin	No break at -40°F
Impact Resistance ASTM D 746 Modified	Skin	Greater than 4 ft-lbs/inch
Hardness ASTM D 2240	Skin	40-80 (Shore D)
Abrasion ASTM D 4060	Skin	Weight Loss: <0.02 oz Wear Index: 2.5 to 3.0 Cycles = 10,000 Wheel = CS17 Load =2.2lb
Chemical Resistance ASTM D 543	Skin Sea Water Gasoline No. 2 Diesel	 < 1.5% weight increase < 7.5% weight increase < 6.0% weight increase

ITEM 594.11000010 – FIBERGLASS REINFORCED PLASTIC (FRP) COMPOSITE LUMBER FOR BRIDGE FENDER

Tensile Properties ASTM D 543	Skin/Core	Minimum 500 psi at break
Compressive Modulus	Skin/Core	Minimum 40 ksi
Coefficient of Friction ASTM F 489	Skin	Minimum 0.25, wet or dry
Nail Pull-Out ASTM D 1761	Skin/Core	Minimum 60 lb

Table 2 – Dimensions and Tolerances

Fiber Reinforced Plastic Lumber	Dimension	Tolerance
Length	Per order	+6 inches / -0 inches
Width x Length	12" x 12"	± 0.250 in
Corner Radius	2.0 inches	± 0.250 in
Outer Skin Thickness	0.1875 inches	± 0.125 in
Distance from outer surface to fiberglass rebar elements	1.5 in	± 0.625 in
Straightness (gap, bend or bulge inside while lying on a flat surface)		< 1.5 inches per 10 feet

Table 3 – Structural Properties for 12" x 12". FRP Lumber with (4) 1.5" Rebar

Member Size	12" x 12"
Modulus of Elasticity	300,000 psi min.
Yield Stress in Bending	4,500 psi min.
Weight	40 to 60 lb/ft

Lumber shall be reinforced with continuous fiberglass reinforcing rods with a minimum flexural strength of 70 ksi when tested in accordance with ASTM D4476 and a minimum compressive strength of 40 ksi when tested in accordance with ASTM D695. Steel reinforcing rods shall not be permitted.
Flame Retardant Skin – The outer skin of the lumber shall include a flame-retardant additive. Each shipment of lumber delivered to the job site shall include a quality control report from the manufacturer certifying these minimum requirements are satisfied.
2. Steel Plates And Hardware
Expansion anchor bolts shall conform to AISI 316 and must be a minimum of 15 inches long
Steel plates shall conform to ASTM A240 Grade 316
Hardware shall be stainless steel and shall conform to ASTM F593

CONSTRUCTION DETAILS

Preparation

A. Before fabricating the lumber material, the Contractor shall submit shop drawings to the Engineer for approval.

Submittals shall include the following:

1. Names and addresses of all Suppliers/Fabricators to be utilized in the Work.
2. 6 Copies of the Contractor's Work Plan and Schedule of Operation to be submitted at least 30 days prior to commencing any work.
3. Shop Drawings/Catalog sheets.

4. Certified copies of mill reports covering the chemical and physical properties of all metal furnished under the Section.

5. Copies of the FRP Composite Lumber manufacturer's standard and most recent product brochure for the product covered by these Specifications.

B. Materials shall be protected at all times against exposure to extreme heat or impact. The lumber shall be shipped in a manner that will minimize scratching or damage to the outer surfaces. The lumber shall be stacked on dunnage above ground so that it may be easily inspected and stored in a manner that will avoid damage. The lumber shall be handled with nylon slings. Sharp instruments shall not be used in handling the product. Lumber damaged in shipping or handling will be rejected.

C. The lumber shall be cut, beveled, drilled, countersunk, and otherwise fabricated in accordance with the approved shop drawings and the manufacturer's recommendations. Set all material accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Securely attach all composite lumber to substrate by anchoring and fastening as shown on plans. All members where possible shall be installed in lengths as long as practicable, and unless otherwise shown, shall have the ends butted together and joined by means of bolted steel splice plates. Splice plates shall not be attached to the channel side of the fender system.

Installation

1. Install composite lumber per manufacturer's instructions.

2. All composite lumber shall be fastened to the piers with stainless steel expansion bolts as shown on drawings. Stainless steel dock or plate washers shall be provided under all bolt heads and nuts.

3. Bolt heads shall be countersunk along navigable channel as indicated on the Contract drawings.

4. Recess all steel plates and hardware a minimum 2" from the fender waler face of the channel side.

5. Provide composite lumber blocking and spacers as necessary.

Tolerances

1. Fender Construction: Variation from elevation and location shall not exceed 2" from those on the Plans.

METHOD OF MEASURMENT

The quantity to be paid for the Fiberglass Reinforced Plastic Composite Lumber will be measured per linear foot furnished and installed for the fender system as shown in the Contract Plans based on the 12" x 12" cross section of FRP composite lumber. No measurement will be made for waste. Composite lumber that are used to replace damaged lumber section that have been previously accepted by the Engineer, but are somehow damaged before completion of the Project, will not be measured for payment.
No separate measurement will be made for blocking, steel, bolts and hardware.

BASIS OF PAYMENT

The unit price bid per meter for Fiberglass Reinforced Plastic Composite lumber complete and accepted in place shall include the cost of furnishing all labor, materials and equipment necessary to complete the work as described herein. The unit price bid per meter for the FRP Composite lumber is based on a 12" x 12" cross section with four 1.625" diameter fiberglass reinforcement bars. The unit price shall also

ITEM 594.11000010 – FIBERGLASS REINFORCED PLASTIC (FRP) COMPOSITE LUMBER FOR BRIDGE FENDER

include furnishing, delivery, storage, and handling all materials, equipment, and labor incidental thereto. The costs incidental to the disposal of cutoff waste material will be included in the unit price bid of the FRP Composite Lumber.

No separate payment will be made for blocking, steel, bolts and hardware.

The work under this Section will be paid for under the following Pay Item:

Item No.	Item	Pay Unit
594.11000010	Fiberglass Reinforced Plastic (FRP) Composite Lumber	LF

ITEM 595.98200018 – SPRAY-APPLIED WATERPROOFING MEMBRANE

DESCRIPTION

The contractor shall furnish and install a spray-applied, waterproofing membrane in accordance with the contract documents, approved Material Detail Sheets (MDS), and as directed by the Engineer. All surface preparation and quality-control testing of substrates and the applied membrane are included.

MATERIALS

The spray-applied, waterproofing membrane shall meet the requirements of §717-02 and *ASTM C1305/ C1305M - 16 Crack Bridging Ability of Liquid-Applied Waterproofing Membrane.*

CONSTRUCTION DETAILS

General. The contractor shall arrange for the membrane manufacturer to have a competent technical representative with necessary equipment to perform the quality-control testing at the job site during all phases of preparation and installation. The technical representative shall present all quality-control testing equipment to the Engineer to verify calibration dates and demonstrate their competency to perform quality-control testing.

The contractor shall submit Safety Data Sheets (SDS) and approved MDS prepared by the membrane manufacturer to the Engineer a minimum of two weeks prior to the scheduled commencement of work. The contractor shall protect personnel exposed to primers and membranes in accordance with SDS and store all components of the membrane, including broadcast aggregates, at the job site in accordance with approved MDS.

The contractor shall use tarpaulin or other suitable masking to protect traffic, the surrounding environment and adjacent features from over spraying.

Membrane Application and Quality-Control Testing.

Substrate Preparation. All surfaces that are to receive the membrane shall be prepared in accordance with the approved (MDS). The contractor shall blast clean all surfaces as a minimum and remove residual matter using brooms and oil/moisture-free compressed air.

Substrate Moisture Content and Temperature. The contractor shall measure the surface moisture content (≤5% reading is required using a moisture meter) and temperature before applying the primer and membrane. The surface moisture content and temperature shall be within allowable tolerances as stated in the approved MDS. The contractor shall perform one test for every two thousand square feet of area as specified in the contract documents or a minimum of three tests.

Substrate Cohesion/Primer Adhesion. After the substrate has been prepared, the contractor shall test the cohesion of the substrate and the adhesion of the primer to the substrate in accordance with *ASTM D4541 – Pull-Off Strength of Coatings Using Portable Adhesion Testers.* The contractor shall conduct tests after the primer has sufficiently cured as determined by the technical representative. One test shall be performed for every two thousand square feet of prepared substrate area and at locations where deficient adhesion is suspected by the Engineer or a minimum of three tests. Required minimum adhesion strengths shall be 300 psi for each test on steel or 150 psi on Portland Cement Concrete substrates before applying primer to the remaining surface area.

Primer Application. The contractor shall apply primer to the substrate surface area at a rate specified in the approved MDS.

Membrane Application. The contractor shall apply each course of the membrane at a rate specified in the approved MDS. The membrane shall be applied in one or two coats to a minimum total thickness of 80 mils.

Membrane Thickness. The contractor shall measure the wet-film thickness of each course of membrane using a standard comb-type thickness gauge or measure the dry-film thickness of each course of membrane using a dry-film thickness gauge for nonferrous substrates.

One measurement for every one hundred square feet of membrane shall be done. The measured thickness of each course of the membrane and the entire thickness of the finished membrane shall be greater than or equal to 80 mils.

Membrane Pin Holes. Following the application and cure of the primer and membrane, the membrane shall be visually inspected for pinholes and integrity. Any defects shall be repaired as per the manufacturer recommendation.

Membrane Adhesion. The contractor shall test the adhesion of the membrane to the substrate in accordance with *ASTM D4541 – Pull-Off Strength of Coatings Using Portable Adhesion Testers.* One test shall be conducted for every two thousand square feet of membrane applied, and at locations where deficient adhesion is suspected by the Engineer or a minimum of three tests. The minimum adhesion strengths shall be 300 psi for each test on steel or 150 psi on Portland Cement Concrete substrates.

The contractor shall repair and correct any deficiencies in the membrane and substrate noted during quality-control testing as recommended by the manufacturer's representative at no additional cost to the State.

Binder Aggregate Application. When cold-applied, wearing-surface overlays are specified, or additional shear resistance between the membrane and the wearing surface is desirable, the contractor shall broadcast an aggregate binder onto the membrane in accordance with the approved MDS.

The aggregate binder shall be applied to the membrane before the membrane cures and as specified in the approved MDS. The aggregate and membrane shall be fully integrated after the aggregate has been applied and the membrane has cured. Loose aggregate shall be removed with brooms or oil/moisture-free compressed air before applying the tack coat.

Tack Coat Application. The contractor shall apply a tack coat to the finished membrane as specified in the MDS prior to overlaying the membrane with a wearing surface.

METHOD OF MEASUREMENT

This work will be measured as the number of square feet of spray-applied, waterproofing membrane satisfactorily furnished and installed as shown on the contract plans or ordered by the Engineer.

BASIS OF PAYMENT

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

ITEM 596.122010WE – STEEL GRID DECK

DESCRIPTION

This work shall consist of furnishing and placing steel grid deck as shown on the Contract Plans and as specified herein. This grid deck panels shall include main bars, supplemental cross bars and reinforcing bars of the size and spacing shown on the Plans. The grid deck panels shall also include stringer connection plates as shown on the Plans.

MATERIALS

Steel Grid Deck

Steel grid deck shall conform to the requirements of Section 596 of the Standard Specifications and ASTM A709 Grade 50 except as modified in the Contract Documents. Miscellaneous structural steel shall conform to the requirements of ASTM A709 Grade 50 unless otherwise noted in the Contract Documents.

Fasteners shall conform to the requirements of ASTM A325, A563 and F436. All fasteners shall be galvanized in accordance to the requirements of ASTM A 153.

Bar reinforcement shall meet the requirements of Section 709-01 of the Standard Specifications.

The grid deck shall be hot-dip galvanized according to ASTM A123. Any defects in galvanizing shall be repaired as specified in ASTM A780. Repair materials containing aluminum shall not be used to restore defective areas.

Working drawings shall be prepared by the Contractor for the Engineer's review and approval in accordance with the New York State Steel Construction Manual. The working drawings shall provide complete details and procedures to complete the assembly and the installation of the grid deck.

CONSTRUCTION DETAILS

Steel Grid Deck

The steel grid deck shall be fabricated and installed in accordance with the New York State Steel Construction Manual and as modified by the Contract Documents.

The fabrication and installation of miscellaneous structural steel items shall be in accordance with the requirements of the New York State Steel Construction Manual and Section 564 of the Standard Specifications.

The Contractor shall verify all dimensions including any modifications to the structure during construction to determine the relative elevations of the deck beams and shall make all necessary adjustments for the fabrication of the grid deck.

The grid-reinforced concrete deck shall be fabricated as shown on the Contract Drawings. The grid deck shall consist of main rolled bars, secondary cross bars, supplemental bars and reinforcing bars. The secondary cross bars shall intersect and be perpendicular to the main bar. The two supplemental bars shall be parallel and evenly spaced between the main bars. Reinforcing bars shall be shop installed between the main bars and supplemental bars. A pan shall be provided as the form for the half-filled concrete grid reinforced deck. The grid-reinforced concrete deck shall have edge bars as detailed on the Plans. Hold-down plates shall be fabricated and installed as shown on the Plans. The individual diagonal bars,

secondary bars, cross bars and main bars of grid deck panels shall be welded at all intersections. The size and type of welds shall be as shown on the Plans.

A. Welding

A welding procedure and a welding sequence shall be submitted for review. Welding procedures shall be submitted for all welds. The welding sequence shall include the sequence and methods to prevent and minimize distortions and residual welding stresses in the completed grid deck. All welding shall be done in accordance with the New York State Steel Construction Manual.

B. Sample Grid Deck Panels

Prior to mass fabrication and production of the grid deck panels, the fabricator shall fabricate a typical grid deck panel of each type. A pre-fabrication meeting shall be held at the fabricator's plant facility for inspection and review of the pre-production grid deck. The Contractor and the Engineer shall attend the meeting. The grid deck fabricator shall not begin fabrication and production of the remaining panels until approval of the sample grid deck by the Engineer. Approved sample grid deck panels may be incorporated into the work.

C. Fabrication

The grid deck shall be fabricated on a level solid surface. The flatness of grid deck panel shall be monitored during the fabrication process. Welding of the grid deck shall be sequenced and controlled to prevent distortions during and after the fabrication process of the grid deck.

D. Tolerances

The grid deck panels shall be fabricated within the following tolerances:

1. Overall Panel Length and Width

Plus zero (+0) to minus 1/4 in. maximum from the approved shop drawings.

2. Panel Squareness

Diagonal lengths between extreme comers of a panel shall measure within 1/2 in. from each other.

3. Panel Flatness

The transverse camber (width) of panel shall be no more than 0.004 times the width of the panel. The longitudinal camber (length) shall be no more than 0.003 times the length of the panel.

4. Sweep

The side bow (sweep) shall be no more than plus or minus 1/4 in. per 10 linear feet in either direction.

5. Main Bar Verticality

   The main bar shall be no more than 3/16 in. out of vertical on the full bar height. No more than 1% of all locations can violate the specified tolerance.

6. Cross Bar Verticality

   None.

7. Main Bar Spacing

   Center to center spacing of the main bar shall be no more than plus or minus 1/8 in. from the detailed bar spacing.

8. Cross Bar Spacing

   Center to center spacing of the cross bar shall be no more than plus or minus 1/8 in. from the detailed bar spacing.

The grid deck panels shall be installed within the following tolerances:

Main bearing bar misalignment between adjacent grid deck panels shall be no more than 1/2 in.

Distance between main bearing bars between adjacent grid deck panels shall be as specified, plus or minus 1/4 in.

E. Transport and Storage

The grid deck panels shall be supported in a manner to prevent distortion during transport and storage. Adequate support or dunnage beneath the grid deck panel shall be provided at the ends of the panel and at intermediate points. The intermediate spacing of the supports or dunnage during transport and storage shall be no more than half the maximum stringer spacing. The grid deck shall be fully secured during transport. The flatness of deck panels shall be within the allowable tolerances as noted above after transport or storage.

F. Handling

The grid deck panels shall be supported in a manner to prevent distortion during handling. Care shall be taken during lifting and placing to avoid overstressing, damaging or distorting the grid deck panels. The panels shall not be placed or dragged over any obstruction that will damage the components of the grid deck.

G. Assembly

The grid deck panels shall be placed and installed in such a manner so that no initial stress is induced into the bridge structure or grid deck panel. No external force shall be applied to the new grid deck panel or bridge structure to fit the component except to close a gap less than 1/16 in. between the new deck panel and new stringer. There shall be no imposed undue stresses or distortions of the grid deck during installation. If a gap greater than 1/16 in. exists between the deck panel and stringer, the Contractor shall provide shims to fill the gap.

Any deck panel installed with an undue stress or distortion shall be removed and replaced with a new panel section at no additional cost to the Department. Any deck panel installed that is not in conformance with contract specifications shall be removed and replaced with a new panel at no additional cost to the Department.

All grid deck panels shall be shop assembled to the bascule leaf with no less than 1/4 of the bolts installed. Torqueing of the deck panel bolts is not required at shop assembly.

H. Repairs

The Contractor shall submit repair procedures for non-conforming grid deck panels or assemblies. The repair procedure shall not be construed as acceptance of the deck panels or assemblies. All repairs shall be documented and submitted to the Engineer.

METHOD OF MEASUREMENT

The quantity shall be measured as the number of square feet of grid deck surface installed in accordance with the plans and this specification.

BASIS OF PAYMENT

The unit price bid per square foot shall include the cost of furnishing all labor, materials and equipment necessary to complete the work. This price shall include, but not be limited to the cost of verification of all dimensions, sample panels, furnishing and installing grid decking, reinforcement, painting, incidental hardware (including connection plates), adjustments and inspection of this work.

Payment will be made under:

Item No.	Item	Pay Unit
596.122010WE	Steel Grid Deck	Square Foot

ITEM 599.061001WE – REHABILITATE BUILDING INTERIOR

DESCRIPTION:

This work shall consist of all labor, materials, tools and equipment necessary to rehabilitate and furnish the operator's building interior in accordance with the provisions of the Contract Documents. This item covers all architectural work including miscellaneous metals and plumbing but excludes the foundations, structural concrete, reinforcing steel, structural steel, HVAC, civil, and electrical work.

MATERIALS:

All provisions of the following sections of the MasterSpec write-up provided in Appendix A of the project shall apply:

Section 024113	Selective Demolition
Section 054000	Cold Formed Metal Framing
Section 072113	Board Insulation
Section 078400	Firestopping
Section 079200	Joint Sealers
Section 081102	Steel Doors and Frames
Section 087100	Finish Hardware
Section 092116	Gypsum Board Systems
Section 092800	Cement Board
Section 093013	Ceramic Tile
Section 096513	Resilient Wall Base
Section 099101	Construction Painting
Section 102800	Toilet and Bath Accessories
Section 112600	Unit Kitchens
Section 224100	Plumbing Fixtures

CONSTRUCTION DETAILS:

All provisions of the above MasterSpec sections shall apply. Performance shall be to the satisfaction of the Engineer.

All provisions of the NYSDOT Standard Specifications for the items listed above shall apply.

METHOD OF MEASUREMENT:

This work will be measured on a Lump Sum Basis for the building constructed in accordance with the Contract Documents.

BASIS OF PAYMENT:

The Lump Sum price bid for the Rehabilitate Building Interior work shall include the cost of all labor, equipment and materials necessary to satisfactorily complete the work.

Payment will be made under:

ITEM 599.061001WE – REHABILITATE BUILDING INTERIOR

Item No.	Item	Pay Unit
599.061001WE	Rehabilitate Building Interior	Lump Sum

APPENDIX A

SECTION 024113

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This section includes the following demolition work pertinent to the construction limit area. All trades are responsible for their respective demolition work, and as following:
   1. Demolition and removal of selected site elements.
   2. Demolition and removal of selected building elements.
   3. Demolition and removal of selected portions of building or structure.
   4. Disconnecting, capping or sealing site utilities.

B. Related Sections include the following:

1.	Section 024113	Selective Demolition
2.	Section 054000	Cold Formed Metal Framing
3.	Section 072113	Board Insulation
4.	Section 078400	Firestopping
5.	Section 079200	Joint Sealers
6.	Section 081102	Steel Doors and Frames
7.	Section 087100	Finish Hardware
8.	Section 092116	Gypsum Board Systems
9.	Section 092800	Cement Board
10.	Section 093013	Ceramic Tile
11.	Section 096513	Resilient Base
12.	Section 099101	Construction Painting
13.	Section 102800	Toilet and Bath Accessories
14.	Section 112600	Unit Kitchens
15.	Section 224100	Plumbing Fixtures

1.03 DEFINITIONS

A. Removals shall be defined as the removal of all items as shown on the drawings.

B. Demolish: Completely remove and legally dispose of off-site.

C. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

D. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

E. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

F. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of the contractor.

1.05 SITE DEMOLITION SUBMITTALS

A. Quality Control Submittals:
   1. Permits: Submit one copy of each permit.
   2. Demolition Plan: For information only, submit one copy of the demolition plan required under Quality Assurance Article.

B. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Locations of proposed dust- and noise-control temporary partitions and means of egress, including access for general public affected by selective demolition operations.
   5. Means of protection for items to remain and items in path of waste removal from site.

C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
   1. Comply with submittal requirements in General Provisions.

E. Predemolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage caused by selective demolition operations.

F. Plans indicating waterproofing and watertight conditions for the existing structure during demolition.

G. Site security requirements need to be addressed in relation to NFPA section 7.2.5 as follows:
   7.2.5. Site Security:
   7.2.5.1. Guard service shall be provided where required by the authority having jurisdiction.

1.06 BUILDING DEMOLITION SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of stairs, and locations of temporary partitions and means of egress.

B. Predemolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with General Provisions. Submit before Work begins.

C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.
   1. Comply with submittal requirements in General Provisions.

1.07 QUALITY ASSURANCE

A. Permits: Before the Work of this Section is started, obtain all permits required by State and local jurisdictions for all phases and operations of the Work.

B. Demolition Plan: Before the Work of this Section is started, prepare a detailed demolition plan. The demolition plan shall include, but not be limited to, detailed outline of intended demolition and disposal procedures. The demolition plan will not

relieve the Contractor of complete responsibility for the successful performance of the Work in accordance with all applicable State and local codes and restrictions.

C. Standards: Comply with ANSI A10.6 and NFPA 241.
   1. Submission requirements under NFPA 241 that need to be made and approved by the Designer including but limited to the following reference section in NFPA 241:
      7.1 Fire Safety Program
      7.1.1 An overall construction or demolition fire safety program shall be developed.

D. Predemolition Conference: Conduct conference at Project site to comply with requirements in General Provisions.

E. Demolition Firm Qualifications:
   1. Standards: Comply with ANSI A10.6 and NFPA 241.

   2. Predemolition Conference: Conduct conference at Project site to review methods and procedures related to selective demolition including, but not limited, to the following:
      a. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

      b. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

      c. Review areas where existing construction is to remain and requires protection.

1.08 RESPONSIBILITY, PROTECTION, DAMAGES, RESTRICTIONS

A. Condition of Space: WCDPW assumes no responsibility for actual condition of the space in which removals and demolition Work is performed.

B. Protections: Provide temporary barricades and other forms of protection required to protect WCDPW property, personnel, and general public from injury due to selective removals and demolition work.
   1. Provide protective measures as required to provide free and safe public passage, WCDPW personnel, and the general public.

   2. Protect from damage existing finish work that is to remain in place and which becomes exposed during operations.

3. Protect floors with building paper or other suitable covering.

C. Damages: Promptly repair any and all damages to all property and finishes caused by the removals and demolition work; to WCDPW satisfaction and at no extra cost to WCDPW

D. Explosives: The use of explosives is prohibited.

E. Power-driven Tools (for interior removals and demolition): Only hand-held electric power-driven tools conforming to the following criteria shall be used to cut or drill concrete and masonry:
   1. Electric Chiselling Hammer
      a. Power Data 115 Volts AC
         7-8 Amps
         Three-wire grounded connection

      b. Percussion 2400-2600 Impacts/Minute

      c. Type/Size Hand-held (+ 18-inch length)

      d. Unit Weight 12-15 pounds (minus chisel bit)

   2. Electric Hammer Drill
      a. Power Data 115 Volts AC
         5-8 Amps
         Three-wire grounded connection

      b. Percussion 2400-3200 Impacts/Minute

      c. Type/Size Hand-held (+ 18-inch length)

      d. Unit Weight 12-15 pounds (minus chisel bit)

      e. Speed Data 0-0500 RPM (Under load)

1.09 PROJECT CONDITIONS

A. Recycle demolition debris to the extent possible.

B. Burning is prohibited.

C. The use of explosives is prohibited.

D. Demolition related equipment shall access the site from street level, unless otherwise approved in writing by the Owner's Representative. Coordinate site access for demolition related equipment with WCDPW.

E. Utilities:
   1. Verify the location and status of all utilities within the Contract Limit Line (CLL).

   2. Utilities that are subject to modification or part of the alteration will be disconnected as a part of this contract. Protect all utilities within and immediately adjacent to the construction limit area during the Work of this Section.

   3. Prior to beginning demolition, verify that all required utilities serving the building to be demolished have been disconnected.

   4. Do not interrupt utility services to buildings which are to remain without previous notification to the Facility Representative, minimum 7 work day notice.

F. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so WCDPW operations will not be disrupted.
   1. Comply with requirements specified in General Provisions.

G. Conditions existing at time of inspection for bidding purpose will be maintained by WCDPW as far as practical.
   1. Before selective demolition, WCDPW will remove the following items:
      a. Loose furniture and electronics
      b. Office equipment

H. Notify WCDPW of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

I. Storage or sale of removed items or materials on-site is not permitted.

PART 2 - PRODUCTS

2.01 MATERIALS

A. NOT USED

B. Contractor to provide the respective material related to the individual trade demolition, as required:

1. Grout: ASTM C 476.

2. Fill Within Building Foundation: Earth, sand, and gravel. Combustible materials, metal glass, broken brick and masonry or other debris are not acceptable.

3. Selected Fill: Sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials.

Sieve	Percent Passing
4 Inch	100
No. 40	0-70
No. 200	0-15

C. Contractor to provide the respective material related to the individual trade demolition, or as follows:

1. Thrust Blocks: Minimum 2500 psi concrete.

PART 3 – ALL TRADES COMMON EXECUTION

3.01 EXAMINATION

A. Verify the utilities that need to be disconnected and capped.
   1. Selective electrical, mechanical and plumbing verification will be done by the Contractor.
   2. Do not interrupt utility services to buildings or interior spaces within the building which are to remain, or outside the construction limit area.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required, per respective contract.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvage, per respective contract.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered per individual contract, investigate

and measure the nature and extent of conflict. Promptly submit a written report to WCDPW.

E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 PREPARATION

A. Prior to demolition make the appropriate preparation with the WCDPW Representative in order for them to clear the construction site of any loose equipment, materials, supplies, barrels, or furnishings, deemed an encumbrance in the construction process.

B. Remove items scheduled to be salvaged for the Facility, and place in designated storage area.

C. Coordinate construction staging areas, construction material and stockpiling, equipment storage, construction site access and temporary diversion of vehicular and pedestrian traffic around project site with WCDPW prior to demolition.

D. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Comply with requirements for access and protection specified in General Provisions.

3.03 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically.

   2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

   3. Selective electrical, mechanical and plumbing demolition will be done by the Contractor.

4. Vermin Control: As demolition and construction process progresses and vermin infestation becomes apparent, employ a "Certified Commercial Applicator," certified by the New York State Department of Environmental Conservation, to exterminate rodents and vermin in the building to be demolished. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

5. Dispose of demolished items and materials promptly.

6. Perform selective demolition Work in a systematic manner and use such methods as are required to complete the Work indicated, and in accordance with the Specifications and governing City, State, and Federal regulations.

7. Carefully remove items, equipment and materials to be retained by the WCDPW. Pre-determine with Facility's delivery and location of delivery of removed items to be salvaged prior removal.

8. Do not place demolition equipment in buildings where it will create excessive loads on supporting walls, floors, and frames. Promptly remove accumulated debris and materials.

9. When walls, partitions, floors and ceilings (or portions thereof) are indicated to be removed; unless indicated otherwise:
   a. Remove all items attached to the surfaces of the construction to be removed.
   b. Selective electrical, mechanical and plumbing demolition related to interior demolition will be done by the Contractor.

10. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations, as specified in NFPA 241. Maintain adequate ventilation when using cutting torches.

B. Removed and Salvaged Items:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until delivery to WCDPW .
   4. Transport items to Owner's storage area on-site designated by WCDPW .
   5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse.
   2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by WCDPW items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain WCDPW property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials and dispose of at an offsite designated area following the proper approvals.

3.05 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.06 BACKFILLING AND GRADING

A. Broken concrete and masonry materials shall not be used for backfill material.

PART 4 – GENERAL CONSTRUCTION EXECUTION

4.01 GENERAL

A. Provide temporary chain link fence and other construction protection elements as described in General Provisions to ensure project safety in and around construction limit area prior the commencement of demolition and construction work.

B. Notify WCDPW and remove loose equipment and other furniture as described in Part 1.09.1 in this section.

C. Remove items scheduled to be salvaged for the Facility, and place in storage area as designated by WCDPW.

D. Temporary Facilities:
   1. Provide protection around selective demolition area and to and from occupied portions of building, as shown in staging plan.
   2. Provide temporary weather protection, during interval between selective demolition of exiting construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
   3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
   4, Ensure that spaces adjacent and effected by construction activities remain condition throughout the length of construction.

E. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

F. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to WCDPW.

G. Clean and/or repair adjacent structures and improvements of dust, dirt, and all debris caused by selective demolition operations.

H. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

I. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

J. Provide support of all plumbing and piping, electrical conduits, and HVAC duct work during demolition slabs and throughout the construction process, and as deemed necessary, in order to facilitate the progress of the work.

4.02 SELECTIVE GENERAL CONSTRUCTION DEMOLITION SCHEDULE

A. Existing Items to Be Removed: Identified elements on the demolition plans, including existing conduit, piping and ceiling tile rails which are no longer in use or functional.

B. Existing Items to Be Removed and Salvaged: Identified elements on the demolition plans.

C. Existing Items to Remain: Identified utilities shown on plans, including any elements and runs servicing the existing facility operations.

4.03 NOT USED

PART 5 – ELECTRICAL CONSTRUCTION EXECUTION

5.01 GENERAL

A. Notify WCDPW and remove loose equipment and other furniture as described in Part 1.09.I in this section.

B. Remove items scheduled to be salvaged for the Facility, and place in storage area as designated by WCDPW.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to WCDPW.

E. Clean and/or repair adjacent structures and improvements of dust, dirt, and all debris caused by selective demolition operations.

F. Coordinate with the Contractor for the protection and temporary support of all electric conduits in a methodical manner as to allow the progress of the construction project in its entirety.

5.02 UTILITY SERVICES AND ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
   1. Comply with requirements for existing services/systems interruptions specified in General Provisions.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and electrical systems serving areas to be selectively demolished.
   1. Selective electrical demolition will be done by the Contractor.

5.03 SELECTIVE ELECTRIC DEMOLITION SCHEDULE

A. Existing Items to Be Removed: As Indicated on Contract Drawings.

B. Existing Items to Be Removed and Salvaged: As indicated on Contract Drawings.

C. Existing Items to Remain: As Indicated on Contract Drawings.

5.04 NOT USED

PART 6 – MECHANICAL CONSTRUCTION EXECUTION

6.01 GENERAL

A. Notify Owner's Representative and remove loose equipment and other furniture as described in Part 1.09.I in this section.

B. Remove items scheduled to be salvaged for the Facility, and place in storage area as designated by WCDPW.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to WCDPW.

E. Clean and/or repair adjacent structures and improvements of dust, dirt, and all debris caused by selective demolition operations.

F. Coordinate with the Contractor for the protection and temporary support of all HVAC ducts in a methodical manner as to allow the progress of the construction project in its entirety.

6.02 UTILITY SERVICES AND MECHANICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
   1. Comply with requirements for existing services/systems interruptions specified in General Provisions.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical systems serving areas to be selectively demolished.
   1. Selective mechanical demolition will be done by the Mechanical Contractor.

6.03 SELECTIVE MECHANICAL DEMOLITION SCHEDULE

A. Existing Items to Be Removed: As Indicated on Contract Drawings.

B. Existing Items to Be Removed and Salvaged: As indicated on Contract Drawings.

C. Existing Items to Remain: As Indicated on Contract Drawings.

PART 7 – PLUMBING CONSTRUCTION EXECUTION

7.01 GENERAL

A. Notify Owner's Representative and remove loose equipment and other furniture as described in Part 1.09.I in this section.

B. Remove items scheduled to be salvaged for the Facility, and place in storage area as designated by WCDPW.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to WCDPW.

E. Clean and/or repair adjacent structures and improvements of dust, dirt, and all debris caused by selective demolition operations.

F. Coordinate with the Contractor for the protection and temporary support of all plumbing piping in a methodical manner as to allow the progress of the construction project in its entirety.

7.02 UTILITY SERVICES AND PLUMBING SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
   1. Comply with requirements for existing services/systems interruptions specified in General Provisions.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and plumbing systems serving areas to be selectively demolished.
   1. Selective plumbing demolition will be done by the Contractor.

7.03 SELECTIVE PLUMBING DEMOLITION SCHEDULE

A. Existing Items to Be Removed: As Indicated on Contract Drawings.

B. Existing Items to Be Removed and Salvaged: As indicated on Contract Drawings.

C. Existing Items to Remain: As Indicated on Contract Drawings.

7.04 NOT USED

END OF SECTION

SECTION 054000

COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Studs in interior walls.
   2. Z-furring channels in interior walls.
   3. Ceiling furring sections
   4. Ceiling channels

B. Related Sections specified elsewhere:
   1. Section 072113: "Board Insulation"
   2. Section 081102: "Steel doors and Frames"
   3. Section 092116: "Gypsum Board Assemblies"
   4. Section 092800: "Cement Board"

1.03 NOT USED

1.04 PERFORMANCE REQUIREMENTS FOR STUDS IN INTERIOR WALL

A. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
   1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
   2. Design non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

1.05 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Shop Drawings: Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping,

bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

1. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Welding certificates.

D. Qualification Data: For professional engineer and testing agency.

E. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:

1. Steel sheet.
2. Expansion anchors.
3. Power-actuated anchors.
4. Mechanical fasteners.
5. Vertical deflection clips.
6. Horizontal drift deflection clips
7. Miscellaneous structural clips and accessories.

F. Research/Evaluation Reports: For cold-formed metal framing.

1.06 QUALITY ASSURANCE

A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.

D. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.

E. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

F. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

G. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
   1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
   2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."

H. Comply with AISI's "Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings."

I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in General Provisions.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:
   1. Allied Studco.
   2. AllSteel Products, Inc.
   3. California Expanded Metal Products Company.
   4. Clark Steel Framing.
   5. Consolidated Fabricators Corp.; Building Products Division.
   6. Craco Metals Manufacturing, LLC.
   7. Custom Stud, Inc.
   8. Dale/Incor.
   9. Design Shapes in Steel.
   10. Dietrich Metal Framing; a Worthington Industries Company.
   11. Formetal Co. Inc. (The).
   12. Innovative Steel Systems.
   13. MarinoWare; a division of Ware Industries.
   14. Quail Run Building Materials, Inc.
   15. SCAFCO Corporation.
   16. Southeastern Stud & Components, Inc.
   17. Steel Construction Systems.
   18. Steeler, Inc.

19. Super Stud Building Products, Inc.
20. United Metal Products, Inc.
21. Or approved equal.

2.02 MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
   1. Grade: ST33H
   2. Coating: G60.

B. Steel Sheet for Vertical Deflection or Drift Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
   1. Grade: 50, Class 1.
   2. Coating: G90.

2.03 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
   1. Supplementary framing.
   2. Bracing, bridging, and solid blocking.
   3. Web stiffeners.
   4. Anchor clips.
   5. End clips.
   6. Foundation clips.
   7. Gusset plates.
   8. Stud kickers, knee braces, and girts.
   9. Joist hangers and end closures.
   10. Hole reinforcing plates.
   11. Backer plates.

2.04 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
   1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

F. Welding Electrodes: Comply with AWS standards.

2.05 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A 780.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.

D. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.06 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
   1. Fabricate framing assemblies using jigs or templates.
   2. Cut framing members by sawing or shearing; do not torch cut.
   3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

C. Install load bearing shims or grout between the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations to ensure a uniform bearing surface on supporting concrete or masonry construction.

D. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.03 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
   1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
   1. Cut framing members by sawing or shearing; do not torch cut.
   2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
      a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

I. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
   1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.04 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.05 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 072113

BOARD INSULATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:

1. Board insulation for partition walls.

B. Related Sections:

1. Section 054000 "Cold Formed Metal Framing"

2. Section 092116 "Gypsum Board Systems"

3. Section 092800 "Cement Board"

1.03 REFERENCES

A. ASTM C165 - Standard Test Method for Measuring Compressive Properties of Thermal Insulations
B. ASTM C203 - Breaking Load and Flexural Properties of Block-Type Thermal Insulation
C. ASTM C272/C272M- Standard Test Method for Water Absorption of Core Materials for Sandwich Constructions
D. ASTM C552- Standard Specification for Cellular Glass Thermal Insulation
E. ASTM C553– Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
F. ASTM C578- Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
G. ASTM C591- Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation
H. ASTM C612- Standard Specification for Mineral Fiber Block and Board Thermal Insulation
I. ASTM C930 - Standard Classification of Potential Health and Safety Concerns Associated with Thermal Insulation Materials and Accessories
J. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
K. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics

L. ASTM D3833/D3833M - Water Vapor Transmission of Pressure-Sensitive Tapes
M. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
N. ASTM E84 - (2020) Standard Test Method for Surface Burning Characteristics of Building materials
O. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials
P. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C
Q. ASTM E154/E154M - Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
R. ICC IBC – International Building Code
S. NFPA – 31 Standard for the Installation of Oil-Burning Equipment
T. NFPA 54 - National Fuel Gas Code
U. NFPA 70 - National Electrical Code
V. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances
W. TAPPI T803 OM - Puncture Test of Container Board
X. 29 CFR 1910.134 - Respiratory Protection

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's product data and application instructions.
B. Manufacturer's Standard Details
   a. Submit manufacturer's standard details indicating methods of attachment and spacing, transition and termination details, and installation details.

1.05 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
B. Installer qualifications:
   a. Installer shall have experience with installation of insulation board; and installation shall be in accordance with insulation manufacturer's installation guidelines.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the site in original sealed wrapping bearing manufacturer's name and brand designation, specification number, type, grade, R-value, and class. Store and handle to protect from damage. Do not allow insulation materials to become wet, soiled, crushed, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storing, and protecting of materials before and during installation.
B. Inspect materials delivered to the site for damage and store out of weather in manufacturer's original packaging. Store only in dry locations, not subject to open flames or sparks, and easily accessible for inspection and handling. Keep materials wrapped and separated from off-gassing materials (such as drying paints and adhesives). Do not use materials that have visible moisture or

biological growth. Comply with manufacturer's recommendations for handling, storage, and protection of materials before and during installation

1.07 SAFETY REQUIREMENTS

A. Provide installers with dust/mist respirators, training in their use, and protective clothing, all approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA) and in accordance with 29 CFR 1910.134

B. Comply with the safety requirements of ASTM C930.

1.08 WARRANTY

A. Warranty Period: Two years from date of Substantial Completion.

B. Warranties must cover all defects that impair the functional performance and appearance of the components. Warranty shall cover complete replacement including affected adjacent Work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Board Insulation - Provide thermal insulating materials as recommended by manufacturer for each type of application indicated. Provide insulation with the following physical properties and in accordance with the following standards:

a. Extruded Preformed Cellular Polystyrene: ASTM C578 REV A

i. Thermal Resistance as indicated on contract drawings.

b. Fire Protection Requirements:

i. Flame spread index of 25 or less when tested in accordance with ASTM E84.

ii. Smoke developed index of 50 or less when tested in accordance with ASTM E84.

iii. Provide insulated assemblies in accordance ICC IBC Chapter Fire and Smoke Protection Features.

c. Other Material Properties:

i. Rigid cellular plastics: Compressive Resistance at Yield shall be per ASTM D1621.

ii. Mineral fiber board: Compressive strength shall be per ASTM C165.

iii. Water Vapor Permeance: shall be per ASTM E96/E96M, desiccant method, in the thickness required to provide the specified thermal resistance, including facings, if any.

iv. Water Absorption: shall be per ASTM C272/C272M.

2.02 ACCESSORIES

A. Adhesive
   a. As recommended by insulation manufacturer.
B. Mechanical Fasteners
   a. Corrosion resistant fasteners as recommended by the insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to receive insulation and or vapor barriers. Notify WCDPW if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

3.02 PREPARATION

A. Installation and Handling
   a. Provide insulation in accordance with the manufacturer's printed installation instructions. Keep material dry and free of extraneous materials.
B. Electrical Wiring
   a. Do not install insulation in a manner that would enclose electrical wiring between two layers of insulation.
C. Cold Climate Requirement
   a. Place insulation on the outside of pipes.
D. Continuity of Insulation
   a. Butt tightly against adjoining boards, studs, rafters, joists, sill plates, headers and obstructions. Provide continuity and integrity of insulation at corners, wall to ceiling joint, roof, and floor. Avoid creating thermal bridges and voids. Provide and verify continuity of insulative barrier throughout the building enclosure.
E. Coordination
   a. Verify final installed insulation thicknesses comply with thicknesses indicated, R-values specified, and with the approved insulation submittal(s).
F. Installation on Walls
   a. Installation using Furring Strips: Install as recommended by insulation manufacturer.
G. Mechanical Attachment on Concrete and Masonry Walls
   a. Cut insulation to cover walls. Apply adhesive to wall and set clip or other mechanical fastener in adhesive as recommended by manufacturer. After curing of adhesive, install insulation over fasteners and bend split prongs to provide a flush condition with the insulation. Butt all edges of insulation and seal with tape.
H. Protection board or coating
   a. Install protection board or coating in accordance with manufacturer's printed instructions. Install protection over all exterior exposed insulation and to 300 mm 1 foot below grade.
I. Adhesively Bonded Systems: Apply adhesive to underside of slab and completely cover wall with insulation

a. Full back bed method or
b. Spot method: Provide at least six spots having a diameter of approximately 4 inches, located at each corner and mid-point of each of the longer sides.
c. As recommended by insulation manufacturer.
d. Use full back method for insulation pieces 1 square foot or less.
e. Butt all edges of insulation and seal with tape.

J. Perimeter and Under Slab Insulation
a. Install perimeter thermal insulation where heated spaces are adjacent to exterior walls, slab edges in slab-on-grade, or floating slab construction

3.03 MANUFACTURER'S INSTRUCTIONS

A. Layout insulation, tape edges, provide vapor retarder and other required accessories to protection against vermin, insects, and damage in accordance with manufacturer's printed instructions.

B. Insulation on Vertical Surfaces
a. Provide thermal insulation on interior face of foundation walls and on edges of slabs-on-grade. Fasten insulation with adhesive.

C. Protection of Insulation
a. Protect insulation from damage during construction and back filling by application of protection board or a coating. Do not leave installed vertical insulation unprotected overnight. Protect installed insulation from weather, including rain and ultraviolet light, from mechanical abuse, compression, and dislocation.

END OF SECTION

SECTION 078400

FIRESTOPPING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section Includes:

1. Firestopping at penetrations in fire-resistance-rated walls.
2. Firestopping at penetrations in horizontal assemblies.
3. Firestopping at partitions, partition/slab junctions

B. Related Sections:

1. Section 054000 "Cold Formed Metal Framing"

2. Section 092116 "Gypsum Board Systems"

3. Section 092800 "Cement Board"

1.03 REFERENCES

A. UL 263 Fire Tests of Building Construction and Materials.

B. UL 1479 Fire Tests of Through-Penetration Firestops.

C. UL 2079 Standard for Safety Tests for Fire Resistance of Building Joint Systems.

D. ASTM E 119 Methods of Fire Tests of Building Construction and Materials.

E. ASTM E 814 Method of Fire Tests of Through-Penetration Fire Stops.

1.04 DEFINITIONS

A. UL Fire Resistance Directory: Product directory published yearly, with supplements, by Underwriters Laboratories Inc., containing listings and classifications in effect as of the published date for product categories covered by UL.

B. Inchcape Directory of Listed Products: Product directory published yearly by Inchcape Testing Services containing listings which reflect certifications granted for materials,

products, systems and equipment which have been tested by Inchcape Testing Services to recognized governing standards.

C. Omega Point Laboratories Listings Directory: Product Directory published yearly by Omega Point Laboratories, Inc. containing listed building products, materials, and assemblies which have been tested by Omega Point Laboratories to recognized governing standards.

D. Factory Mutual Approval Guide: Product directory published yearly, with supplements, by Factory Mutual Research Corp., containing listed building products, materials, and assemblies which have been tested by Factory Mutual Research Corp., to recognized governing standards.

E. F Rating: Prohibits flame passage through the system and requires acceptable hose stream test performance.

F. T Rating: Prohibits flame passage through the system and requires the maximum temperature rise on the unexposed surface of the wall or floor assembly, on the penetrating item and on the fill material not to exceed 325 degrees F above ambient, and requires acceptable hose stream test performance.

G. Company Field Advisor: An employee of the Company which lists and markets the primary components of the system under their name who is certified in writing by the Company to be technically qualified in design, installation, and servicing of the required products or an employee of an organization certified by the foregoing Company to be technically qualified in design, installation and servicing of the required products. Personnel involved solely in sales do not qualify.

1.05 DESIGN REQUIREMENTS

A. Devices and materials shall meet the hourly fire resistance ratings required by the Project as determined by UL 263, UL 1479, UL 2079, ASTM E 119 or ASTM E 814 and be listed and detailed in the UL Fire Resistance Directory, Inchcape Directory of Listed Products, Factory Mutual Approval Guide, or the Omega Point Laboratories Listings Directory.

1. Exception: Where no listed designs exist that meet the requirements of a specific project condition, submit details and manufacturer's written recommendations for a design meeting the requirements. Include evidence of engineering judgment and extrapolation from listed designs.

1.06 SUBMITTALS

A. Submittals Package: Submit the following items specified below the same time as a package:

1. Product Data.
2. Samples.
3. Quality Control Submittals.
4. Firestop Schedule.

B. Product Data: Catalog sheets, specifications and installation instructions for each firestop device and material.
   1. Indicate design number for each firestop proposed to be used which is detailed in the UL Fire Resistance Directory, Inchcape Directory of Listed Products, Factory Mutual Approval Guide, or the Omega Point Laboratories Listings Directory.
   2. State the specific locations where each firestop system is proposed to be installed.

C. Samples: One of each product if requested.

D. Quality Control Submittals:
   1. Design Data: Show details and include engineering information and manufacturer's written recommendations required under Design Requirements Article for each proposed firestop if other than a design detailed in the UL Fire Resistance Directory, Inchcape Directory of Listed Products, Factory Mutual Approval Guide, or the Omega Point Laboratories Listings Directory.
      a. State the specific locations where each firestop is proposed to be installed.
   2. Installer's Qualifications Data:
      a. Name of each person who will be performing the Work and their employer's name, business address and telephone number.
      b. Names and addresses of 3 similar projects that each person has worked on during the past 5 years.
   3. Company Field Advisor Data:
      a. Name, business address and telephone number of Company Field Advisor secured for the required services.
      b. Certified statement from the Company listing the qualifications of the Company Field Advisor, and listing of services and each product specifically listed for this Project for which Company Field Advisor is given authorization by the Company to render advice.

E. Firestop Schedule: Submit schedule itemizing the following:
   1. Manufacturer's product reference numbers and/or drawing numbers.
   2. UL, Inchcape Testing Services, Factory Mutual Research Corp., or Omega Point Lab design number.
   3. Location of firestop material.
   4. Penetrating Item Description/Limits: Material, size, insulated or uninsulated, and combustibility.
   5. Maximum allowable annular space or maximum size opening.
   6. Wall type construction.
   7. Floor type construction.
   8. Hourly Fire resistance rating of wall or floor.
   9. F rating.
   10. T rating, if available.

NOTE: Firestop Schedule is for information only, and will not be acted on for approval. Refer to Sample Firestop Schedule bound in Appendix.

1.07 QUALITY ASSURANCE

A. Installer Qualifications: The persons installing the firestopping and their supervisor shall be personally experienced in firestop work and shall have been regularly employed by a company installing firestopping for a minimum of 3 years.

B. Pre-Installation Conference: Before the firestop work is scheduled to commence, a conference will be called by the Director's Representative at the Site for the purpose of reviewing the Contract Documents and discussing requirements for the Work. The conference shall be attended by related trade Contractors (if any), their qualified firestopping installers, and associated firestopping manufacturer's Company Field Advisors.

C. Container/Package Labels: Include manufacturer's name and identifying product number, date of manufacturer, lot number, shelf life (if applicable), qualified testing and inspecting agency classification marking, curing time, and mixing instructions for multi-component materials.

D. Company Field Advisor: Secure the services of a Company Field Advisor for the following:
   1. Render advice regarding suitability of firestopping materials and methods.
   2. Assist in completing firestop schedule.
   3. Attend pre-installation conference.

E. Field-Constructed Sample Installations: Prior to installing firestopping, erect sample installations for each type through-penetration firestop system indicated in the Firestop Schedule to verify selections made and to establish standard of quality and performance by which the firestopping work will be judged.
   1. Build sample installations to comply with the following requirements, using materials indicated for final installations.
      a. Locate sample installations on site at locations where directed.
      b. Obtain Director's Representative's acceptance of sample installations before start of firestopping installation.
      c. Retain and maintain sample installations during construction in an undisturbed condition.
      d. Accepted sample installations in an undisturbed condition at time of substantial completion of Project may become part of completed firestopping work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver firestopping materials to the Site in original, new unopened containers or packages bearing manufacturer's printed labels.

B. Store and handle firestopping materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, etc.

1.09 PROJECT CONDITIONS

A. Environmental Requirements:

1. Temperature: Do not install firestopping materials when ambient or substrate temperatures are outside limits permitted by manufacturer of firestopping materials.
2. Humidity and Moisture: Do not install the Work of this Section under conditions that are detrimental to the application, curing, and performance of the materials.
3. Ventilation: Provide sufficient ventilation wherever firestopping materials are installed in enclosed spaces. Follow manufacturer's recommendations.

1.10 SEQUENCING AND SCHEDULING

A. Leave exposed those firestopping installations that are to be concealed behind other construction until the Director's Representative has examined each installation.

PART 2 PRODUCTS

2.01 FIRESTOPPING-GENERAL

A. Through-Penetration Firestop Devices, Forming Materials, And Fill, Void or Cavity Materials: As listed in the UL Fire Resistance Directory, Inchcape Directory of Listed Products, Factory Mutual Approval Guide, or the Omega Point Laboratories Listings Directory.
1. For firestopping exposed to moisture, furnish products that do not deteriorate when exposed to this condition.
2. For firestopping systems exposed to view, furnish products with flame-spread values of less than 25 and smoke developed values less than 50, as determined per ASTM E 84.
3. For penetrations for piping services below ambient temperature, furnish moisture-resistant through-penetration firestop systems.
4. For penetrations involving insulated piping, furnish through-penetration firestop systems not requiring removal of insulation.

B. Accessories: Components required to install fill materials as recommended by the firestopping manufacturer for particular approved fire rated system.

C. Identification Labels:
1. Furnished by fire stopping manufacturer of suitable material for permanent field identification of through-penetration firestops.
2. Identify the following:
   a. "WARNING - FIRESTOP MATERIAL".
   b. Company Name.
   c. Product Catalog number.
   d. F rating.
   e. T rating, if available.
3. Field fabricated labels are not acceptable.

D. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under

conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

E. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

F. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated.

G. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
2. T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.

2.02 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN), and perimeter firestop systems (XHDG) listed in Volume 2 of the UL Fire Resistance Directory; provide products of the following manufacturers as identified below:

1. Hilti, Inc., Tulsa, Oklahoma 1-800-879-8000
2. 3M Fire Protection Products, 3M Center, Bldg 223-2N-20, St. Paul, MN 55144 1-800-328-1687 (option 7)
3. Or approved equal. Substitution requests shall be considered in accordance with contract provisions.

2.03 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Fire-resistance-rated walls include fire walls fire-barrier walls smoke-barrier walls and fire partitions.
2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Horizontal assemblies include floors floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.

E. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

F. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

G. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

H. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

1. Permanent forming/damming/backing materials, including the following:

   a. Slag-wool-fiber or rock-wool-fiber insulation.
   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
   c. Fire-rated form board.
   d. Fillers for sealants.

2. Temporary forming materials.
3. Substrate primers.

4. Collars.
5. Steel sleeves.

2.04 FILL MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

2.05 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials,

water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine existing through-penetrations of floors, walls, partitions, and ceilings in the Work areas.

B. Examine existing junctures, control joints, and expansion joints in the Work areas.

C. Where firestopping is missing or not intact, submit a written report to WCDPW describing the existing conditions.

3.02 PREPARATION

A. Clean out openings immediately before installation of through-penetration firestopping. Comply with recommendations of firestopping manufacturer and the following requirements:
   1. Remove foreign materials from surfaces of openings, and from penetrating items that could interfere with adhesion of firestopping.
   2. Clean opening and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form release agents from concrete.

B. Clean out openings, and juncture, control, and expansion joints immediately before installation of firestopping. Comply with recommendations of firestopping manufacturer and the following requirements:
   1. Remove foreign materials from surfaces of openings and joint substrates, and from penetrating items that could interfere with adhesion of firestopping.
   2. Clean opening joint substrates to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.
   3. Remove laitance and form release agents from concrete.

C. Protection:
   1. Protect surfaces adjacent to through-penetration firestops with non-staining removable masking tape or other suitable covering to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or that would be caused by cleaning methods used to remove smears from firestopping materials.

D. Substrate Priming:

1. Prime substrates in accordance with the firestopping manufacturer's printed installation instructions using recommended products and methods.
2. Do not allow primer to spill or migrate onto adjoining exposed surfaces.

3.03 INSTALLATION OF THROUGH PENETRATION FIRESTOPS

A. Use through-penetration firestop devices, forming materials, and fill, void or cavity materials to form through-penetration firestops to prevent the passage of flame, and limit temperature rise of the unexposed surface as detailed in the UL Fire Resistance Directory, Inchcape Directory of Listed Products, Factory Mutual Approval Guide, or the Omega Point Laboratories Listings Directory.
   1. Where applicable design is not detailed in the Directories, use forming materials and fill, void or cavity material to form through-penetration firestop in accordance with approved printed details and installation instructions from the company producing the forming materials and fill, void or cavity material.
   2. If the construction type(s) of the building cannot be determined, provide firestopping with fire resistance ratings as specified in the Building Code of New York State, Tables 720.1(1), 720.1(2), 720.1(3), and 302.3.2.

B. Provide through-penetration firestop systems with F ratings that shall equal or exceed the fire resistance rating of the penetrated building construction.

C. Provide through-penetration firestop systems with T ratings, in addition to F ratings, at floors where the following conditions exist:
   1. Where firestop systems protect penetrations located outside the wall cavities.
   2. Where firestop systems protect penetrations located outside fire resistive shaft enclosures.
   3. Through-penetration firestop systems protecting floor penetrations require a T-rating of at least 1 hour, but not less than the required floor fire-resistance rating.

D. Firestop through-penetrations of floors, walls, partitions, ceilings, and roofs.

E. Firestop through-penetrations associated with the new Work.

F. Firestop through-penetration of partitions identified on the Construction Work Drawings as smoke partitions and fire rated assemblies.

G. Firestop through-penetrations of floors, walls, partitions, ceilings, and roofs in accordance with the fire resistance rating assigned to the walls, partitions, floors, ceilings, and roofs on the Construction Work Drawings.

H. In areas where through-penetration items have been installed before the construction work, firestop the through-penetration items after the construction work has been completed. Furnish drawings or written information to the Construction Work Contractor covering the provisions to be made in the construction work to enable firestopping of the through-penetration items.

I. Permanently affix label at each firestop. Use adhesive compatible with surface construction at firestop location.

3.04 INSTALLATION OF JUNCTION, CONTROL, AND EXPANSION JOINT FIRESTOPS

A. Use joint treatment materials to form firestop to prevent the passage of flame and limit temperature rise of the unexposed surface, as detailed in the UL Fire Resistance Directory, Inchcape Directory of Listed Products, Factory Mutual Approval Guide or the Omega Point Laboratories Listings Directory.

1. Where applicable design is not detailed in the Directories, use forming materials and fill, void or cavity material to form firestop in accordance with approved printed details and installation instructions from the company producing the forming materials and fill, void or cavity material.
2. If the construction type(s) of the building cannot be determined, provide firestopping with fire resistance ratings as specified in the Building Code of New York State, Tables 720.1(1), 720.1(2), 720.1(3), and 302.3.2.

B. Firestop junctures, control joints, and expansion joints.

C. Firestop junctures, control joints, and expansion joints associated with the new Work.

D. Firestop junctures, control joints, and expansion joints associated with smoke partitions and fire rated construction.

E. Permanently affix labels every 10 feet along each firestop. Use adhesive compatible with surface construction at firestop location.

3.05 CLEANING

A. Clean off excess fill materials and sealants adjacent to penetrations by methods and cleaning materials recommended by manufacturers of firestopping products and of products in which penetrations occur.

B. Remove masking tape as soon as practical so as not to disturb the firestopping's bond with substrate.

C. Protect firestopping during and after curing period from contact with contaminating substances, or damage resulting from adjacent Work.

D. Cut out and remove damaged or deteriorated firestopping immediately, and install new materials as specified in firestop schedule.

3.06 PENETRATION FIRESTOPPING SCHEDULE

A. Select UL-classified systems from the attached schedule and submit "Through-Penetration Firestopping Schedule" as specified in Article 1.04, Submittals.

THROUGH PENETRATION FIRE STOPPING SCHEDULE

THIS SCHEDULE INDICATES WHICH SERIES OF UL CLASSIFIED THROUGH PENETRATION FIRE STOPPING (TPFS) ASSEMBLIES ARE ACCEPTABLE FOR THIS PROJECT BASED ON BARRIER TYPE, BARRIER CONSTRUCTION AND PENETRANT TYPE.
EACH SYSTEM WITHIN A GIVEN SERIES IS CLASSIFIED FOR SPECIFIC PENETRATION CONDITIONS. CONTRACTOR SHALL SELECT TPFS ASSEMBLIES THAT ARE CLASSIFIED FOR USE WITH EACH PENETRATION'S CONDITION BASED ON CRITERIA SUCH AS THE FOLLOWING: PENETRATION SIZE, PENETRATION SHAPE, PENETRANT SIZE(S), PENETRANT MATERIAL(S), PENETRANT QUANTITY, LOCATIONS(S) OF PENETRANT(S) WITHIN PENETRATION.

BARRIER			PENETRANT TYPE											
TYPE	BASIS OF CONSTRUCTION	FIRE STOPPING REQUIREMENTS	NO PENETRANTS	METALLIC, UNINSULATED PIPE, CONDUIT, OR TUBING (EXAMPLES: COPPER, IRON, STEEL)	NONMETALLIC, UNINSULATED PIPE, CONDUIT, OR TUBING (EXAMPLES: PVC, CPVC, GLASS)	ELECTRICAL CABLES	CABLE TRAYS W/ELECTRICAL CABLES (NOTE 9)	INSULATED PIPES (EXAMPLES: COPPER, GLASS, IRON, PLASTIC, STEEL) IN SYSTEMS OPERATING BETWEEN 32 DEGF (0 DEGC) AND 122 DEGF (50 DEGC) (NOTE 1)	INSULATED PIPES (EXAMPLES: COPPER, GLASS, IRON, PLASTIC, STEEL) IN SYSTEMS OPERATING BETWEEN 32 DEGF (0 DEGC) OR ABOVE 122 DEGF (50 DEGC) (NOTE 2)	MISC ELECTRICAL PENETRATIONS (EXAMPLES: BUS DUCTS)	METAL DUCT	UL LISTED ELECTRICAL BOXES	OTHER RECESSED DEVICES (NOTE 3)
WALL	METAL STUDS & GYPSUM WALLBRD	UL CLASSIFIED SYSTEM — SINGLE PENETRANT	W-L-0000 SERIES OR NOTE 4	W-L-1000 SERIES	W-L-2000 SERIES	W-L-3000 SERIES	W-L-4000 SERIES	W-L-5000 SERIES	W-L-5000 SERIES	W-L-6000 SERIES	W-L-7000 SERIES	CLIV OR NOTE 8	NOTE 8
		UL CLASSIFIED SYSTEM — MULTIPLE PENETRANTS		W-L-8000 SERIES NOTE 5				W-L-8000 SERIES NOTE 5	W-L-8000 SERIES NOTE 5	N/A	N/A	N/A	
UL DESIGN NO. - U400 SERIES		F RATING	EQUAL TO BARRIER RATING										
		T RATING	EQUAL TO F RATING (NOTE 9)										
		ADDITIONAL REQUIREMENTS	NONE	NONE	NONE	NONE	NONE	NONE	NOTE 6	NONE	NOTE 7	NONE	NONE
WALL	POURED CONC., CONC. BLOCK OR MASONRY	UL CLASSIFIED SYSTEM — SINGLE PENETRANT	W-J-0000 SERIES OR NOTE 4	C-AJ-1000 OR W-J-1000 SERIES	C-AJ-2000 OR W-J-2000 SERIES	C-AJ-3000 OR W-J-3000 SERIES	C-AJ-4000 OR W-J-4000 SERIES	C-AJ-5000 OR W-J-5000 SERIES	C-AJ-5000 OR W-J-5000 SERIES	C-AJ-6000 SERIES	C-AJ-7000 OR W-J-7000 SERIES	??	NOTE 8
		UL CLASSIFIED SYSTEM — MULTIPLE PENETRANTS		C-AJ-8000 OR W-J-8000 SERIES - NOTE 5				C-AJ-8000 OR W-J-8000 SERIES - NOTE 5	C-AJ-8000 OR W-J-8000 SERIES - NOTE 5		N/A	N/A	
UL DESIGN NO. FOR CONCRETE BLOCK WALL - U900 SERIES (ANY THICKNESS)		F RATING	EQUAL TO BARRIER RATING										
		T RATING	EQUAL TO F RATING (NOTE 9)										

	ADDITIONAL REQUIREMENTS	NONE	NONE	NONE	NONE	NONE	NONE	NOTE 6	NONE	NOTE 7	NONE	NONE
WALL: POURED CONC. BLOCK OR MASONRY UL DESIGN NO. FOR CONCRETE BLOCK WALL - U900 SERIES MINIMUM THICKNESS GREATER THAN EIGHT INCHES	UL CLASSIFIED SYSTEM: SINGLE PENETRANT	NOTE 4	C-BK-1000 OR W-K-1000 SERIES	N/A	N/A	W-K-4000 SERIES	N/A	N/A	N/A	N/A	N/A	NOTE 8
	UL CLASSIFIED SYSTEM: MULTIPLE PENETRANTS		N/A									
	F RATING	EQUAL TO BARRIER RATING										
	T RATING	EQUAL TO F RATING (NOTE 9)										
	ADDITIONAL REQUIREMENTS	NONE										
FLOOR: POURED CONC. ANY THICKNESS	UL CLASSIFIED SYSTEM: SINGLE PENETRANT	C-AJ-0000 SERIES, F-A-0000 SERIES OR NOTE 4	C-AJ-1000 OR F-A-1000 SERIES	C-AJ-2000 OR F-A-2000 SERIES	C-AJ-3000 OR F-A-3000 SERIES	C-AJ-4000 OR F-A-4000 SERIES	C-AJ-5000 OR F-A-5000 SERIES	C-AJ-5000 OR F-A-5000 SERIES	C-AJ-6000 SERIES	C-AJ-7000 OR F-A-7000 SERIES	??	NOTE 8
	UL CLASSIFIED SYSTEM: MULTIPLE PENETRANTS		C-AJ-8000 OR F-A-8000 SERIES -- NOTE 5				C-AJ-8000 OR F-A-8000 SERIES - NOTE 5	C-AJ-8000 OR F-A-8000 SERIES - NOTE 5		N/A	N/A	
	F RATING	EQUAL TO BARRIER RATING										
	T RATING	EQUAL TO F RATING (NOTE 9)										
	ADDITIONAL REQUIREMENTS	NONE	NONE	NONE	NONE	NONE	NONE	NOTE 6	NONE	NOTE 7	NONE	NONE
FLOOR: POURED CONC. MINIMUM THICKNESS GREATER THAN FIVE INCHES	UL CLASSIFIED SYSTEM: SINGLE PENETRANT	C-BJ-0000 SERIES OR NOTE 4	C-BJ-1000 OR F-B-1000 SERIES	C-BJ-2000 OR F-B-2000 SERIES	C-BJ-3000 OR F-B-3000 SERIES	C-BJ-4000 OR F-B-4000 SERIES	C-BJ-5000 OR F-B-5000 SERIES	C-AJ-5000 OR F-A-5000 SERIES	C-AJ-6000 SERIES	C-BJ-7000 OR F-B-7000 SERIES	??	NOTE 8
	UL CLASSIFIED SYSTEM: MULTIPLE PENETRANTS		C-BJ-8000 OR F-B-8000 SERIES -- NOTE 5				C-AJ-8000 OR F-A-8000 SERIES - NOTE 5	C-BJ-8000 OR F-B-8000 SERIES - NOTE 5		N/A	N/A	
	F RATING	EQUAL TO BARRIER RATING										
	T RATING	EQUAL TO F RATING (NOTE 9)										
	ADDITIONAL REQUIREMENTS	NONE	NONE	NONE	NONE	NONE	NONE	NOTE 6	NONE	NOTE 7	NONE	NONE

THIS SCHEDULE USES THE IDENTIFICATION SYSTEMS OF UNDERWRITERS LABORATORIES, INC. AS DEFINED IN THEIR "FIRE RESISTANCE DIRECTORY" AND AS USED BY MANUFACTURERS ON THEIR UL CLASSIFIED SYSTEM.

INDICATED RATINGS MAY BE EXCEEDED. "N/A" = NOT APPLICABLE

END OF SECTION

SECTION 079200

JOINT SEALERS

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Steel Doors and Frames: Section 081102
B. Finish Hardware: Section 087100
C. Gypsum Board Systems: Section 092116
D. Cement Board: Section 092800
E. Resilient Base: Section 096513
F. Plumbing Fixtures: Section 224100

1.02 SUBMITTALS

A. Product Data: Catalog sheets, specifications, and installation instructions for each product specified except miscellaneous materials.

B. Samples:
1. Sealants: One pint or standard tube.
2. Joint Fillers: 24 inch long full section.
3. Gaskets: 24 inch long full section.
4. Joint Primer/Sealer/Conditioners: One pint.
5. Backer Rods: 24 inch long full section.
6. Bond Breaker Tape: 24 inch long full section.
7. Expansion Joint: Pre-compressed, self-expanding, tensionless, UL2079 FR Sealant system with Silicone coated surface, watertight, 2 hr rate sealant system, traffic grade.
8. Expansion Joint Cover Plate: Molded reinforced elastomeric hinged cover system, indicating pertinent dimensioning, component connections and anchorage methods: 24 inch long full section.

C. Quality Control Submittals:
1. Installer's Qualifications Data: Affidavit required under Quality Assurance Article.
2. Company Field Advisor Data: Name, business address, and telephone number of Company Field Advisor.

1.03 QUALITY ASSURANCE

A. Installer's Qualifications: The persons installing the sealants and their supervisor shall be personally experienced in the installation of sealants and shall have been regularly employed by a company engaged in the installation of sealants for a minimum of two years.

1. Furnish to the Director the names and addresses of five similar projects which the foregoing people have worked on during the past two years.
2. Furnish a letter from the sealant manufacturer, stating that the foregoing people are authorized to install the manufacturer's sealant materials and that the manufacturer's specifications are applicable to the requirements of this Project.

B. Pre-Installation Meeting: Prior to starting the Work and before materials are ordered, a meeting will be held at the Site to discuss the specifications, details, and application requirements. The meeting shall be attended by the Contractor, the sealant applicator and the sealant manufacturer's Company Field Advisor.

C. Container Labels: Include manufacturer's name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable), and packaging date or batch number.

D. Test and validate sealants used for exterior weathersealing per the Sealant Waterproofing Restoration Institute (SWRI).

E. Warranties:
1. Silicone sealants: 20 years Weatherseal Warranty.
2. Polyurethane or Silicone: 5 year Weatherseal Warranty.
3. Sealants for Granite, Marble and Limestone: 20 year Non-Stain Warranty.

F. Manufacturer shall be ISO-9001:2000 certified and shall provide written confirmation that a formal Quality management System and Quality Processes have been adopted in the areas of, (but not limited to) Engineering Manufacturing, Quality control and Customer Service for all processes, products and their components. Alternate manufacturers will be considered provided they submit written proof that they are ISO 9001:2000 certified prior to the project bid date.

1.04 PROJECT CONDITIONS

A. Environmental Requirements:
1. Temperature: Unless otherwise approved or recommended in writing by the sealant manufacturer, do not install sealants at temperatures below 40 degrees F or above 85 degrees F for non-silicone sealants and below minus 20 degrees F or above 125 degrees F for silicone sealants.
2. Humidity and Moisture: Do not install the Work of this section under conditions that are detrimental to the application, curing, and performance of the materials.
3. Ventilation: Provide sufficient ventilation wherever sealants, primers, and other similar materials are installed in enclosed spaces. Follow manufacturer's recommendations.

B. Protection:

1. Protect all surfaces adjacent to sealants with non-staining removable tape or other approved covering to prevent soiling or staining.
2. Protect all other surfaces in the Work area with tarps, plastic sheets, or other approved coverings to prevent defacement from droppings.

PART 2 PRODUCTS

2.01 SEALANTS

A. Type 1 Sealant, any of the following generic types:

1. One-part, low-modulus silicone sealant: Dow Corning 790, Dow Corning 791,Dow Corning 795, General Electric Silpruf, Pecora 864, Pecora 890, Pecora 890FTS.
2. One-part, non-sag silicone or polyurethane sealant: Bostik Chem-Calk 900, Bostik Chem-Calk 915, Bostik Chem-Calk 916 Textured, Bostik Chem-Calk 2020, Pecora Dynatrol I, Sika Sikaflex 1a, Sonneborn Sonolastic NP I, or Tremco DyMonic (not SWRI), Dow Corning Contractors Weatherproofing Sealant (CWS), Dow Corning Concrete Sealant (CCS), Pecora 895.
3. Two-part, non-sag silicone or polyurethane sealant: Bostik Chem-Calk 500 (not SRWI), Pecora Dynatrol II, Dow Corning CWS or CCS.

B. Type 1A Sealant:

1. For Horizontal Joints: Two-part, self-leveling silicone or polyurethane sealant for traffic bearing construction; Bostik Chem-Calk 550 (not SWRI), Tremco Vulkem 255, Pecora Urexpan NR-200, Pecora Silicone 310SL, Bostik Chem-Calk 550, Dow Corning Parking Structure Sealant FC or SL, Dow Corning Contractors Concrete Sealant, Sikaflex 2c SL
2. For Vertical Joints: Two-part, non-sag silicone or polyurethane sealant; Bostik Chem-Calk 500 (not SWRI), Tremco Vulkem 227, Pecora Dynatrol II, Pecora Silicone 311NS, Dow Corning Parking Structure Sealant NS, Dow Corning CCS, Sikaflex 2c NS EZ.

E. Type 1D Sealant: One-part, mildew resistant silicone sealant; Dow Corning 786, Dow Corning Tub and Ceramic, Pecora 898 Sanitary Silicone, General Electric Sanitary SCS1700, or Bostik Silicone Rubber Bathroom Caulk.

F. Type 2 Sealant: One-part acrylic polymer sealant; Pecora AVW-920, PTI 738, or Tremco Mono.

G. Type 2A Sealant: One-part acrylic or elastomeric sealant for sealing small joints; PTI 200 or Tremco Small Joint Sealant, Pecora AC-20.

H. Type 3 Sealant: One-part butyl rubber sealant; Pecora BC-158, PTI 707, or Bostik Chem-Calk 300 (not SWRI).

I. Type 4 Sealant: One-part silicone sealant for high temperatures; Bostik 9732 High Temp Red, Dow Corning Silastic 736 RTV, Dow Corning High Temp, General Electric RTV 106.

J. Type 5 Sealant: Flame and smoke resistant intumescent sealant; Metacaulk MC 150+, 3M Fire Barrier Caulk CP 25, Dow Corning 790.

K. Sealant Colors: For exposed materials provide color as indicated or, if not indicated, as selected by WCDPW from manufacturer's standard colors. For concealed materials, provide the natural color which has the best overall performance characteristics.

2.02 JOINT FILLERS

A. Self-Expanding Cork Joint Filler: Resilient, non-extruding type pre-molded cork units; ASTM D 1752, Type III.

B. Cork Joint Filler: Resilient, non-extruding type pre-molded cork units; ASTM D 1752, Type II.

C. Closed Cell Neoprene Joint Filler: ASTM D 1056, Class SC (oil resistant and medium swell), 2 to 5 psi compression deflection.

D. Expanded Polyethylene Joint Filler: Flexible, compressible, closed-cell polyethylene of not less than 10 psi compression deflection (25 percent).

E. Closed Cell Polyurethane Joint Filler: Resilient, compressible, semi-rigid; W.R. Meadows Ceramar or A.C. Horn Closed Cell Plastic Foam Filler, Code 5401.

F. Pre-formed Expansion Joint; Watson Bauman ACME, WABO Fireshield, or approved equal:

1. Sealant system shall be comprised of the following components: 1) fire retardant, impregnated foam not comprised of un-bonded vertical laminations and will fully extend without putting tension on the substrate, 2) pre-coated on both sides with silicone proven not to de-bond or separate if exposed to thermal shock cycling, 3) field-applied epoxy or UL listed adhesive, 4) system must not rely on a water based intumescent surface coating as part of the 2 or 3 hour fire rated sealant system. 5) Silicone fillet beads may be used where appropriate to prove a uniform seal with the substrate. Impregnated foam material must be proven not to take a compression set over time and the fire rated joint sealant must not rely on "injected sealant bands" along the substrate for its sealing properties.

2. Material shall be capable of movements of -25%, +25% (50% total) to -50% +50% (100% total) of nominal material size depending on the anticipated movement of the joint design. Standard sizes from ½" to 2". Depth of seal is 4"

3. Silicone external color facings to be low-modulus, waterproof silicone factory applied to the foam at a width greater than maximum joint extension such that the joint is never under tension within its rated movement range. When compressed to final supplied dimension, a bellow(s) to handle movement must be created in the silicone coating.

2.03 GASKETS

A. Hollow Neoprene Gasket: Hollow or compartmentalized neoprene extrusion, designed to withstand compression to 40 percent of normal width without extrusion from joint, and with full recovery; heavy, durable top member, suitable for long-term exposure to weather and traffic, hardness of 55 Shore A; ASTM D 2628.

B. Adhesive Closed-Cell PVC Gasket: Closed-cell, flexible, self-adhesive, non-extruding, polyvinylchloride foam gaskets; ASTM D 1667.

2.04 MISCELLANEOUS MATERIALS

A. Joint Primer/Sealer/Conditioner: As recommended by the sealant manufacturer for the particular joint surface materials and conditions.

B. Backer Rod: Compressible rod stock of expanded, extruded polyethylene.

C. Bond Breaker Tape: Polyethylene or other plastic tape as recommended by the sealant manufacturer; non-bonding to sealant; self-adhesive where applicable.

D. Cleaning Solvents: Oil free solvents as recommended by the sealant manufacturer. Do not use re-claimed solvents.

E. Masking Tape: Removable paper or fiber tape, self-adhesive, non-staining.

F. Expansion Joint Cover Plate: Provide molded reinforced elastomeric hinged cover system utilizing extruded ethylene propylene diene monomer (EPDM) with integral steel plates for reinforcement.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine all joint surfaces for conditions that may be detrimental to the performance of the completed Work. Do not proceed until satisfactory corrections have been made.

3.02 PREPARATION

A. Clean joint surfaces immediately before installation of sealant and other materials specified in this Section.

1. Remove all loose materials, dirt, dust, rust, oils and other foreign matter that will impair the performance of materials installed under this Section.
2. Remove lacquers, protective coatings and similar materials from joint faces with manufacturer's recommended solvents.
3. Do not limit cleaning of joint surfaces to solvent wiping. Use methods such as grinding, acid etching or other approved and manufacturer's recommended means, if required, to clean the joint surfaces, assuring that the sealant materials will obtain positive and permanent adhesion.

B. Set joint fillers at proper depth and position as required for installation of bond breakers, backer rods, and sealants. Do not leave voids or gaps between the ends of joint filler units.

1. Smooth Edged Joints: For joints between two concrete slabs or where new concrete abuts smooth edged materials use either cork joint filler or closed cell polyurethane joint filler.
2. Irregular Edged Joints: For joints where new concrete abuts granite curbs or other irregular edges use closed cell polyurethane joint filler.

C. Priming Joint Surfaces:

1. Prime joints which are to receive Type 1A and 1B Sealants.
2. Prime joints of friable (crumbly, chalky) masonry surfaces which are to receive Type 1 Sealant.
3. Prime joints other than those above if so recommended by the manufacturer's printed instructions.
4. Do not allow the primer/sealer to spill or migrate onto adjoining surfaces.

3.03 JOINT BACKING INSTALLATION

A. Install bond breaker tape in relaxed condition as it comes off the roll. Do not stretch the tape. Lap individual lengths.

B. Install backer rod of sufficient size to fill the joint width at all points in a compressed state. Compress backer rod at the widest part of the joint by a minimum of 25 percent. Do not cut or puncture the surface skin of the rod.

3.04 SEALANT INSTALLATION

A. Except as shown or specified otherwise, install sealants in accordance with the manufacturer's printed instructions.

B. Install sealants with ratchet hand gun or other approved mechanical gun. Where gun application is impractical, install sealant by knife or by pouring as applicable.

C. Types 2 and 2A Sealants: If low temperature makes application difficult, preheat sealants using manufacturer's recommended heating equipment.

D. Type 4 Sealant: Allow sealant to cure for a minimum of 3 days before backfilling.

E. Finishing: Tool all vertical, non-sag sealants so as to compress the sealant, eliminating all air voids and providing a neat smoothly finished joint. Provide slightly concave joint surface, unless otherwise indicated or recommended by the manufacturer.

1. Use tool wetting agents as recommended by the sealant manufacturer.

3.05 FIELD QUALITY CONTROL

A. Test Samples:

1. Where directed, for each 1000 linear feet of joint installed, cut out and carefully remove a 6 inch long sample of the undisturbed sealant and joint backer material from the newly installed Work. Remove the samples in the presence of the Director's Representative who will retain them for evaluating and testing.
2. Reseal cut out areas with the same materials.

3.06 CLEANING

A. Immediately remove misapplied sealant and droppings from metal surfaces with solvents and wiping cloths. On other materials, remove misapplied sealant and droppings by methods and materials recommended in writing by the manufacturer of the sealant material.

B. After sealants are applied and before skin begins to form on sealant, remove all masking and other protection and clean up remaining defacement caused by the Work.

END OF SECTION

SECTION 081102

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other General Provisions.

1.02 SUMMARY

A. Section includes interior hollow-metal doors at lower level.

B. Related Requirements:
1. Section 054000: Cold Formed Metal Framing
2. Section 087100: Finish Hardware for door hardware
3. Section 092116: Gypsum Board Systems
4. Section 092800: Cement Board
5. Section 099101: Construction Painting

1.03 REFERENCES

A. ANSI- American National Standard Institute
1. A240: Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications.
2. A250.4-2001 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.

B. NAAMM National Association of Architectural Metal Manufacturers
1. HMMA 830-1997 Hardware Preparations and Locations for Hollow Metal Doors and Frames.
2. HMMA 831-1997 Recommended Hardware Locations for Hollow Metal Doors and Frames.
3. HMMA 840-1999 Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.
4. HMMA 861-2000 Guide Specification for Commercial Hollow Metal Doors and Frames.

C. NFPA National Fire Protection Association
1. NFPA 80- 2010 Standard for Fire Doors and other Opening Protectives.

1.04 DEFINITIONS

A. Steel Door and Frame Manufacturer: Manufacturer of steel doors and frames regularly engaged in the manufacturing of such products for use in commercial, institutional, educational and other similar applications.

B. Company Field Advisor(s): An employee of the steel door and frame

manufacturer who is certified in writing by the manufacturer to be technically qualified in design, installation, and servicing of products.

C. Steel Door and Frame Distributor: Distribution Company who regularly engages in the distribution of steel doors and frames of the manufacturer whose doors and frames are submitted for this project.

D. Certified Installation Supervisor: Designated supervisor/installer, who has a minimum three years experience in steel frame and door installation, and is certified in writing by the steel door and frame manufacturer as qualified and responsible to ensure approved steel frames and doors are installed, adjusted, and operate properly.

1.05 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.05 SUBMITTALS

B. Submittals Packages
   1. Door and Frame Schedule and Shop Drawings Package: Submit as a complete package. Incomplete packages will be returned unreviewed.
      a. Quality Assurance Submittal
         1) Certification of Compliance as described in the Quality Assurance Article.
         2) Company Field Advisor's Qualification Data
            a) Name of Company Field Advisor and Employer's name, business address and telephone number and e-mail address.
            b) Names and addresses of 3 similar projects Company Field Advisor has worked on during the past three years.
            c) Written certification on steel door and frame manufacturer's letterhead that Company Field advisor is technically qualified in design, installation, and servicing of the products furnished for this Project.
         3) Certified Supervisor's and Installer's Qualification Data
            a) Name of Supervisor and each Installer performing Work, and Employer's name, business address and telephone number.
            b) Names and addresses of 3 similar projects Supervisor and each Installer has worked on during the past three years.
            c) Written certification on steel door and frame manufacturer's letterhead that Supervisor/Installer is technically qualified to ensure approved steel frames and doors are installed, adjusted, and operate properly.

b. Include schedule of doors and frames using the same reference numbers for details and opening as those shown on the contract drawings.
c. Include Product Data: Manufacturer's catalog sheets, specifications, and detailed installation instructions. Highlight products and options pertaining to this Project.

2. Closeout Submittals: Submit as a complete package.
a. Operation and Maintenance Manuals: Furnish 2 (two) hard cover three ring binders with project name and number prominently displayed on the front cover and the spine.
b. Listing of Manufacturer, address and contact information
c. Approved Door and Frame Submittal including shop drawings and product data sheets
d. Manufacturer's dated warranty for this specific project identified by WCDPW, project number, and manufacturer's order number.
e. Certification: Written certification from the Company Field Advisor that their products are installed according to manufacturer's printed installation instructions, and are operating properly.

1.06 QUALITY ASSURANCE

A. Uniformity and single source responsibility:
1. Provide steel doors and frames from a single source manufacturer who specializes in this type of work.

B. Certification of Compliance: A statement, written on steel door and frame manufacturer's letterhead, that certifies their products, submitted for this Project, have been tested and comply with references named in the References Article of this specification section, and as modified by other requirements this specification.

C. Field Measurements: Verify existing openings by field measurements before fabrication and indicate measurements on shop drawings.

D. Pre-Submittal Conference: Pre-Submittal Conference: Before the steel door and frame submittals are written, the contractor, the steel door and frame distributor, the steel door and frame shop drawing preparer, and the steel door and frame designer shall attend a conference to discuss the contract requirements for the steel door and frame submittal package, including but not limited to, quality assurance items to be submitted, the cover sheet, index, page numbering, schedule formatting, product nomenclature, installation notes, preparations for electric hardware, and product data sheets.

E. Pre-installation Conference: When steel frames are on site, and before steel frame installation begins, the Director's Representative shall call a conference at the site to review the approved Steel Door and Frame Submittal, approved Finish Hardware Submittals, and proper installation procedures for the Work as well as:
1. Pre-installation inspection of Doors and Frames
a. Use and coordination of approved Steel Door and Frame submittals with approved Finish Hardware Submittals in the pre-

installation inspection process
b. Reading and understanding manufacturer's Door and Frame tags
c. Inspection and verification of labeling and label placement
1) Specified fire labels (attached metal labels) on doors and frames,
2) Label locations
3) Label legibility
d. Inspection and verification of proper welding of frames
e. Inspection and verification of hardware reinforcement and preparations in frame head and jambs.
f. Inspection and verification of required anchors and fasteners.
g. Inspection and verification of glass kit preparations in doors
h. Inspection and verification of Electric hardware preparation in frames and doors

2. Review of maximum allowable clearances between frames and doors; doors and floor; and meeting stiles of doors, and verification methods.
3. Verification of plumb, square and level frame installation with jamb rabbets parallel to one another.
4. Review of proper frame installation tools.

The contractor, frame installers, certified Company Field Advisor, WCDPW designer; and WCDPW inspector shall attend the conference. Facility personnel may attend. The WCDPW designer will present installation information.

1.07 SAMPLES FOR VERIFICATION:

A. For each type of exposed finish required prepared on Samples of not less than 3 by 5 inches.

B. For "Doors" and "Frames" subparagraphs below, prepare Samples approximately 8 by 10 inches to demonstrate compliance with requirements for quality of materials and construction:
1. Doors: Show vertical-edge, top and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
2. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

1.08 SCHEDULE: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings, Coordinate with final Door Hardware Schedule.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames in heavy paper cartons or other protective packaging. Remove any plastic protective wrap from the package.

B. Store doors and frames under cover, in a dry area, on raised platforms in vertical position with minimum 4 inch blocking between units to allow air circulation.

C. Clearly label packaging, and doors and frames, for identification and installation location.

PART 2 PRODUCTS

2.01 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A1011/A1011M-04a 2004.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel complying with ASTM A1008/A1008M-04b 2004.

C. Galvannealed Steel Sheets: Zinc Iron Alloy-Coated carbon steel sheets of commercial quality complying with ASTM A 653/653M, with A 60 zinc coating.

D. Anchors and Supports: Fabricate of not less than 16 gage sheet steel unless otherwise indicated.
   1. Galvanized Units: Galvanize anchors and supports to be used with galvanized frames, complying with ASTM A 153, Class B.

E. Anchorage Devices, Bolts, and Other Fasteners: Manufacturer's standard units unless otherwise indicated.
   1. Galvanized Units: Galvanize items and comply with ASTM A 153, Class C or D as applicable.

2.02 DOORS

A. General:
   1. Design and Thickness: 2 outer stretcher-leveled steel sheets not less than 14 gage, seamless, hollow construction, 1-3/4 inches thick.
   2. Construct doors with smooth flush surfaces without visible joints or seams on exposed faces or stile edges, except around glass and louver panels. Continuously MIG, ARC or laser weld vertical edges full height of door, grind smooth, and dress to achieve seamless edge. Tack welded, putty filled edges are not acceptable.
   3. Reinforce vertical edges by a continuous steel channel not less than 14ga extending the full height of door.
   4. Close top and bottom of horizontal edges with 14 gage steel channel spot welded to the inside of the face sheets a maximum of 4 inches on center.
   5. Continuously weld the closing end channels to the vertical edge reinforcing channel at all four corners producing a fully welded exterior.
   6. Provide minimum 16 gage flush steel top and bottoms caps, notched at both ends to fit hinge and lock channels, installed with a minimum of 6 welds per cap. Grind welds, body fill and finish smooth.
   7. Sound Deadening (ASTM E 90): Minimum Sound Transmission Class of 25.
   8. Door Edges: Bevel lock stile edge of single acting hinged doors 1/8 inch in 2 inches. "V" bevel meeting stiles of pairs of doors, except at double egress locations where meeting stiles are parallel.

B. Fire Rated Assemblies: Wherever a fire resistance classification is shown or scheduled for steel doors and frames; provide fire rated units that have been tested as fire door assemblies, and comply with National Fire Protection

Association (NFPA) Standard No. 80 and these specifications.

1. Identify each door and frame with a factory applied metal UL, FM, or WHI label.
2. Label shall remain legible, and shall not be obscured by prime painting or finish painting.
3. Indicate the applicable fire rating on the door label.
4. Locate labels on the hinge edge of door and jamb rabbet of frame.
5. Where continuous hinges are specified, apply labels on the header rabbet of frame and on top exposed edge of door. Locate labels as close to hinge edge as possible.
6. At the manufacturer's and/or contractor's expense, retain a third party inspector to recertify fire rated doors and frames, and to replace primed and finish painted labels.

B. Doors:
   a. Fabricate doors with 2 outer stretcher-leveled, A60 galvanized steel sheets.
   b. Reinforce inside of doors with polystyrene slab with a minimum .24 U factor, permanently bonded to inside of each face sheet.

C. Restroom Ceiling Hinged Access Panel
   a. Basis-of-Design Product: Karp Associates, Inc. Flush Access Door or approved equal.
   b. 12" X 12" Door Size
   c. 16 ga. steel frame and 14 ga. steel door with radius corners
   d. Pin type hinge
   e. Locks shall be flush and screwdriver operated
   f. Finish shall be prime coat of rust inhibitive electrostatic powder, baked white enamel. Stainless steel shall have No. 4 satin polish finish.

2.03 FRAMES

A. General:
   1. Furnish steel frames for doors and other openings, as shown, of size and profile as indicated.
   2. Construction: Full welded unit construction, with corners mitered and continuously welded full depth and width of frame, unless otherwise specified or shown. Knock-down type frames will not be accepted.
      a. Fixed Stops: Integral 5/8 inch stop unless otherwise shown.
      b. Removable Beads: Removable steel beads secured with machine screws. Form corners with butted hairline joints.
   3. Do not drill frames for silencers.
   4. Weld steel shipping spreaders to the underside of the jamb legs, requiring removal of the spreaders prior to frame installation.

B. Frames: Form of hot-rolled steel sheets, not less than 14 gage, zinc alloy iron coated A60 galvannealed.

C. Wall Anchors: Unless otherwise specified or shown, formed of not less than 16

gauge galvannealed steel.

1. Steel Stud Construction: Weld-in type welded to back of frame unless otherwise indicated or approved. Furnish at least 4 anchors per jamb up to 7'-6" jamb height; 5 anchors per jamb to 8 foot jamb height; one additional anchor per jamb for each 24 inches or fraction thereof over 8 feet high.

D. Floor Anchors: Furnish floor anchor for each jamb and mullion which extends to floor, formed of not less than 16 gage steel, with 2 holes to receive fasteners, welded to bottom of jamb or mullion, and galvanized if used with galvanized frames

2.04 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from warp, buckle and defects. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To assure proper assembly at Project site, clearly identify items that cannot be permanently factory-assembled before shipment.

B. Exposed Fasteners: Countersunk flat, or oval head torx center pin screws and bolts. Unless otherwise indicated, locate fasteners 2 inches from ends of members and not more than 12 inches apart.

C. Finish Hardware Reinforcements:
1. Minimum 10 gage continuous reinforcement for continuous hinges.
2. Install 7 gage reinforcement for butt hinges, or hinge reinforcement in door edge may be one piece 12 gage channel full door height with extruded hinge screw holes having an average minimum thread pull-out strength of 1600 pounds per hole.
3. Minimum 12 gage reinforcement for other hardware.
4. Weld 14 gage steel tongues, 1-1/2 inches high, inside lock mortise to keep lock body centered in door.
5. Closer reinforce doors and provide full profile closer reinforcement in frames for full width of opening, whether or not closers are specified.

D. Finish Hardware Preparation:
1. Factory prepare doors and frames to receive mortised and concealed hardware, including cutouts; reinforcing; drilling and tapping, in accordance with approved Finish Hardware Schedule and templates furnished by hardware manufacturers.
2. Factory reinforced doors and frames to receive surface applied hardware. Drill and tap for surface applied hardware at project site.

E. Finish Hardware Locations: Locate hardware reinforcements and mortises so hardware locations comply with requirements of HMMA 831, "Recommended Hardware Locations for Custom Hollow Metal Doors and Frames", and as follows:
1. Knobs, Levers, Crescents : Centerline 3'2" from finished floor.
2. Mortise Deadlocks: Centerline not to exceed 48" above finished floor.

F. Clearances: Fabricate doors for their respective frames within the following clearances:
   1. Jambs and Head: 3/32 to 1/8 inch.
   2. Meeting Edges of Pairs: 1/8 to 3/16 inch.
   3. Bottom (no threshold): 3/4 inch, maximum to finished surface.
   4. Bottom (at threshold): 3/8 inch, maximum to top of threshold or carpet.
   5. Fire Rated Doors: Comply with clearances specified in NFPA Standard No.80.
   6. Measure door clearances from stile edge to jamb.

G. Factory Prefinish Painting:
   1. Chemically wash, rinse, and dry exposed and concealed surfaces of fabricated units.
   2. Apply one coat of primer with vinyl binder to surfaces and oven-bake units.
   3. Units shall be capable of passing the following tests:
      a. Salt Spray Test complying with ASTM B 117-97 for 120 continuous hours.
      b. Water Fog Test complying with ASTM D 1735-97 for 240 continuous hours.

H. Factory Prime Painting:
   1. See section 099101 "Construction Painting" for prime finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine substrates, areas and conditions, with installer present under which frames are to be installed for defects that will adversely affect execution and quality of Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

A. Prior to installation adjust and securely brace door frames for squareness, alignment, twist, and plumb to the following tolerances:
   1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
   2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
   3. Twist: Plus or minus 1/16", measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
   4. Plumbness: Plus or minus 1/16 inch, measured at jamb face on a perpendicular line from head to floor.

B. Drill and tap doors and frames to receive non-templated mortised and surface mounted hardware.

3.03 INSTALLATION

A. General: Install steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
   1. Frames: Install frame of size and profile indicated. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set.
      a) Remove temporary braces necessary for installation only after frames have been properly set and secured.
      b) Check plumb, squareness, and twist of frames as walls are constructed. Adjust as necessary to comply with installation tolerances.
   2. Installation Tolerances: Adjust door frames for squareness, alignment, twist, and plumb to the following tolerances:
      a) Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
      b) Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
      c) Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
      d) Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. Doors: Fit non-fire-rated doors accurately in frames with the following clearances:
   1. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
   2. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
   3. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

3.04 ADJUSTING AND CLEANING

A. Final Adjustments:
   1. Check and readjust operating hardware items immediately before final inspection.
   2. Leave work in complete and proper operating condition.
   3. Remove and replace defective work including doors or frames that are warped, bowed, or otherwise unacceptable.

B. Clean foreign materials off steel doors and frames immediately after installation.

3.05 FINAL INSPECTION

A. Upon completion of the project, the Director's representative will schedule a final inspection to verify doors and frames are properly installed and adjusted. The contractor, door and frame installer, and design representative will attend.

B. Upon verification, the design representative will certify in writing components are properly installed and adjusted within referenced tolerances in accordance with this specification. Include this certification in the Close-out Submittals.

END OF SECTION

SECTION 087100

FINISH HARDWARE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This section includes the following:
   1. Finish hardware schedule for interior doors at lower level.

B. Related work in other sections
   1. Joint Sealers: Section 079200
   2. Steel Doors and Frames: Section 081102

1.03 REFERENCES

A. NFPA 80 Fire Doors and Windows (2007).

B. NFPA 101 Life Safety Code (2006).

C. Building Code of New York State (2010).

D. ICC/ANSI A117.1-2003 Accessible and Usable Buildings and Facilities.

E. ANSI/BHMA Standard A156.1 Butts and Hinges (2006).

F. ANSI/BHMA Standard A156.4 Door Controls – Closers (2008).

G. ANSI/BHMA Standard A156.6 Architectural Door Trim (2005).

H. ANSI/BHMA Standard A156.7 Template Hinge Dimensions (2009).

I. ANSI/BHMA Standard A156.8 Door Controls – Overhead Stops and Holders (2005).

J. ANSI/BHMA Standard A156.13 Mortise Locks and Latches Series 1000 (2005).

K. ANSI/BHMA Standard A156.16 Auxiliary Hardware (2008).

L. ANSI/BHMA Standard A156.18 Materials and Finishes (2006).

M. ANSI/BHMA Standard A156.22 Door Gasketing Systems (2005).

N. ANSI/BHMA Standard A156.26 Continuous Hinges (2006).

O. DHI - Door and Hardware Institute.

P. NAAM Standard HMMA 800-96- Hollow Metal Manufacturers Association.

Q. NAAM Standard HMMA 831-97 Recommended Hardware Locations for Custom Hollow Metal Doors and Frames.

R. 2010 Standards for State and Local Government Facilities: Title II.

1.04 DEFINITIONS

A. Architectural Hardware Consultant (AHC): A Door and Hardware Institute certified expert in complex architectural openings requiring advanced knowledge of model building codes and safety standards, ADA requirements, access control knowledge and installation expertise.

B. Architectural Hardware Distributor: A company that regularly purchases architectural hardware from manufacturers and specializes in the sale, service and support of that hardware to contractors and/or end users.

C. Company Field Advisor(s): Hardware manufacturers' representatives who are certified in writing by manufacturer to be technically qualified in design, installation, and servicing of products.

D. Installation Supervisor: Designated supervisor/installer, who has a minimum three years experience in finish hardware installation, and is qualified and responsible to ensure approved finish hardware is installed, adjusted, and operates properly.

E. Benchmark: Finish hardware installed on full size door and frame assembly that is constructed on-site. Benchmarks are constructed to verify qualities of materials and execution; to review coordination between frames, doors, and architectural hardware; to show interface between partitions and frames; and to demonstrate compliance with specified installation tolerances. Benchmarks are not samples. Unless otherwise indicated, approved benchmarks establish the standard by which the Work will be judged. The approved benchmark may be incorporated into the work of this section.

1.05 SUBMITTALS

A. NOT USED

B. NOT USED

C. Submittal Package Cover Sheets: The Hardware Distributor shall provide a cover sheet, which identifies each package by:

1. WCDPW project number.

2. Project name.
3. Facility name and location.
4. Submittal Package name.
5. Specification section name and number.
6. Construction Contractor's company name, address, e-mail address, and telephone number.
7. Finish Hardware Distributor's company name, address, e-mail address, and telephone number.
8. Certified Architectural Hardware Consultant's name, company name, address, e-mail address, and telephone number.
9. Submittal Date.

D. Submittal Packages
1. Quality Control Package: Do not submit balance of packages until this package is approved.
   a. Architectural Hardware Consultant Data:
      1) Provide name, business address, and telephone number of DHI certified Architectural Hardware Consultant.
      2) Submit photocopy of Door and Hardware Institute's certificate demonstrating individual is an Architectural Hardware Consultant.
   b. Company Field Advisor Data:
      1) Provide name, business address, and telephone number of Company Field Advisor(s) for continuous hinges, door bolts, locksets, overhead stops, door closers, and gaskets.
      2) List services and products for which company field advisor(s) is/are certified by manufacturer. Provide written certifications.
   c. Hardware Distributor's Qualification Data:
      1) Provide the Finish Hardware Distributor's company name, address, e-mail address, and telephone number.
      2) Provide the hardware distributor's company history, including number of years in the hardware distribution business, the number of AHC's employed, and the number of employees. Describe the distributor's major market.
      3) Include the names and contact information of physical plant managers for 3 facilities, similar to this project, for which the distributor has furnished architectural hardware within the past 2 years.
   d. Supervisor's/Installer's Qualification Data:
      1) Name of Supervisor and each installer performing Work, and employer's name, business address and telephone number.
      2) Names and addresses, and contact information of physical plant managers for 3 facilities, similar to this project, on which each installer has worked on during past 2 years.
2. Finish Hardware Package:
   a. Finish Hardware Schedule: Use vertical format and indicate finish hardware items, both mechanical and electrical in one

document, required to complete Work of this section. Submit Hardware Schedule that includes complete hardware sets for each door and frame shown on Door Schedule.

1) Preface schedule with following:
   a) Certified Architectural Hardware Consultant's statement of preparation of/or certification of, Finish Hardware Schedule.
   b) Index.
   c) List of manufacturers.
   d) List of finishes.
   e) Explanation of abbreviations.
   f) Keying instructions and key schedule.
2) Create hardware groups, each group consisting of similar doors and hardware. Do not combine labeled and non-labeled openings. Do not combine doors and frames with dissimilar door sizes and/or materials.
3) For each opening include the following:
   a) Door and frame materials and dimensions.
   b) Fire rating.
   c) Door number, location and handing.
   d) Degree of opening required for closer and/or overhead stop.
   e) Installation and detailing notes.
4) Under each group heading, list hardware items in detail, required for ordering. For each hardware item include:
   a) Type (Hinges).
   b) Quantity (Hinges 3ea).
   c) Manufacturers' name (Hinges 3ea Stanley).
   d) Catalog number (Hinges 3ea Stanley FBB199).
   e) Size (Hinges 3ea Stanley FBB199 4 ½ x 4 ½).
   f) Options or accessories (Hinges HTFBB199 4 ½ x 4 ½).
   g) Finish (Hinges HTFBB199 4 ½ x 4 ½ x 630).
   h) Fasteners (Hinges HTFBB199 4 ½ x 4 ½ x 630 x torx with center security pin).
   i) Indicate location of protection plates: Push side or pull side.
   j) Installation Notes, as written in this section, for each hardware group.
5) Use a separate hardware group in Hardware Schedule that lists attic stock hardware items, key cabinets, key control system, special tools required to install hardware, lubricants, and Operations and Maintenance Manuals.

b. Product Data: Furnish six copies of manufacturers' catalog sheets, specifications, sizing charts, and installation instructions, for each item specified. Highlight information pertaining specifically to product (s) submitted.

c. Submit samples as requested.

3. Closeout Submittals Package: Submit as a complete package.

a. Operation and Maintenance Manuals: Furnish 2 hardcover three ring binders with the project name and number displayed on the front cover and spine. Include:
   1) List of Manufacturers.
   2) Approved Finish Hardware Schedule.
   3) Approved Manufacturers' Product Data Sheets.
   4) Manufacturer's operation, installation, maintenance, and repair instructions for each type of hardware furnished.
   5) Templates for kind of hardware furnished.
   6) Parts List for each type of finish hardware furnished.
   7) Manufacturers' dated written warranty for each type of finish hardware furnished.
   8) Certifications: Written certification from Company Field Advisors that their products are installed according to manufacturers' printed installation instructions, are operating properly, and manufacturers' written warranty will be in effect upon physical completion of the Work.
   9) Special Tools: List of special tools required to install hardware, and their purpose.

b. Special Tools:
   1) At conclusion of finish hardware installation, turn over to Director's Representative 2 of each special tool required to install hardware together with a list of these tools and their purpose.

1.06 TEMPLATES

A. After receipt of approved submittals, furnish templates to affected trades, to enable fabricators to make provision for finish hardware without delaying the Work of the Project.

1.07 DELIVERY AND STORAGE

A. Coordinate delivery to avoid delay.

B. Clearly label each item for identification and installation location as it corresponds to the approved Finish Hardware Schedule and subsequent information bulletins.

C. Deliver hardware to the jobsite in the manufacturers' original packages complete with fasteners, parts, installation instructions, and templates required for proper installation.

D. Inventory hardware at jobsite to identify shortages or backorders. Resolve delivery shortages and damaged items prior to installing hardware.

E. Store finish hardware where directed by WCDPW. Provide locked, dry storage for finish hardware.

1.08 QUALITY ASSURANCE

A. Hardware Distributor's Qualification:
   1. Hardware Distributor who has been in the business of furnishing, and/ or installing finish hardware for a minimum of three years.
   2. Hardware Distributor shall have the DHI certified Architectural Hardware Consultant prepare or certify the Finish Hardware Submittal meets specification requirements, and the schedule is written accurately and in accordance with DHI recommendations, and requirements of this specification.

B. Company Field Advisors: Employ advisor(s) for continuous hinges, door bolts, mortise locksets, surface overhead stops, door closers, and gaskets.

C. Installation Supervisor: Employ a qualified Installation Supervisor who will be responsible to ensure approved finished hardware is installed, adjusted and operates properly.

D. Installers: Employ experienced finish hardware installers who have been regularly employed by a Company installing finish hardware for a minimum of 5 years.

E. Pre-submittal Conference: Before Finish Hardware Submittals are written for submission, the WCDPW will call a teleconference to review Finish Hardware Submittal requirements including but not limited to format, cover sheet, headings, hardware sets, level of detail, installation notes, description of operation, keying, and product data sheets. The Contractor, the Finish Hardware Distributor, the Finish Hardware Detailer, and consulting hardware designer, and WCDPW Designers shall attend. The WCDPW Finish Hardware Reviewer shall conduct the conference.

F. On Site Pre-installation Conference: Before finish hardware installation begins, the Director's Representative will call a conference at the site to review Finish Hardware Specifications, approved Finish Hardware Submittals, and to discuss requirements for the Work including:
   1. Hardware delivery and storage.
   2. Hardware labeling by door number.
   3. Hardware locations.
   4. Potential location conflicts.
   5. Hardware installation sequence and responsibility.
   6. Required accessories and fasteners.
   7. Continuous hinge installation.
   8. Surface overhead stops and closer template and adjustments.
   9. Special tools and maintenance items.
   10. Hardware Closeout requirements.
   11. Hardware Warranties.

G. Pre-installation Conference Attendance: The Construction Contractor, Company Field Advisors, authorized Finish Hardware Installers, and the Finish Hardware Distributor's Architectural Hardware Consultant shall attend the conference. WCDPW's Finish

Hardware Reviewer conducts the meeting. WCDPW designers and facility personnel may attend. The Company Field Advisors will present installation instruction and advice.

H. Pre-Benchmark-Construction Meeting: Prior to the construction of the mock-up, a meeting will be held at the site to review the requirements, and discuss the intent of the mock-up. The meeting will be scheduled by the WCDPWand conducted by the Hardware Designer. The meeting shall be attended by the WCDPW, the Hardware Designer, the Contractor's onsite foreman, the person supervising this phase of the Work (if different), and the person (people) who will be performing the work.

I. Construction of Benchmark: Before installing portions of the Work requiring benchmarks, install benchmarks for each form of construction required to comply with the following requirements, using materials indicated for the completed Work.
   1. Build hardware benchmark in door and frame assembly, specified in section 081102, in locations as directed, and include continuous hinge, lockset, closer, surface overhead stop and gaskets.
   2. Notify the WCDPW in advance of dates and times when benchmark will be constructed.
   3. Install benchmark with supervisor oversight and workers who will be employed during the construction of the Work.
   4. Construct benchmarks using the exact materials, products, methods, and workmanship that were approved for the Work.
   5. Obtain WCDPW approval of benchmarks before starting work, fabrication, or construction.
   6. Maintain benchmarks during construction in an undisturbed condition as a standard for judging the completed Work.
   7. Failure to maintain this standard of quality will be cause for rejection of the Work.
   8. Benchmark may be used in the Work unless otherwise indicated.

J. Uniformity of Hardware and Single Source Responsibility: For each kind of hardware provide product(s) of a single manufacturer.

K. Size Variations: Manufacturers' products may vary slightly from sizes specified except where minimum size or thickness is specified.

1.09 WARRANTY

A. Manufacturer's Warranty: Ten year minimum warranty for door closers.

B. Manufacturer's Warranty: Three year minimum for locksets.

1.10 MAINTENANCE

A. Special Tools: At the conclusion of finish hardware installation, turn over to Owner's Representative 2 sets of each special tools required for proper installation and adjustment of hardware, together with a list of these tools and their purpose.

B. Lubricants: Provide manufacturer's recommended lubricants for locksets and closers sufficient for 1 year of maintenance. Turn over to WCDPW.

PART 2 PRODUCTS

2.01 ACCESSORIES

A. Provide brackets, plates, arms, spacers, and special templates to mount door closers in combination with overhead stops and coordinators, on narrow top rails and for special ceiling and jamb conditions.

B. Provide curved lip strikes, with wrought boxes, specific to individual lock functions. Universal strikes that fit a variety of lock functions are not acceptable.

2.02 FASTENINGS

A. Provide fasteners that harmonize with finish hardware material and finish.

B. Provide torx center pin security fasteners for exposed hardware, including full mortise hinges.

C. Provide machine screws for hardware secured to metal; and machine screws and metal expansion shields for attachment to masonry substrates. Self-tapping or self-drilling screws are not acceptable.

D. Provide undercut shallow head torx center pin security fasteners where necessary for proper seating.

E. Attach door closers and overhead stops with sex bolts.

2.03 MATERIALS AND FINISHES

A. General: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in this section and in the Hardware Groups.

B. Hinges
   1. Barrel-type manufactured from 14-gauge 304 stainless steel.
   2. .25" diameter stainless steel non-rising pins.
   3. Provide hinges without covers.

C. Locks, Latches and Bolts
   1. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
   2. Provide 3/4" minimum throw on other latch bolts.
   3. Provide 1" minimum throw deadbolts.

D. Closers and Door Control Devices

1. Closer bodies: Provide closer bodies with the same hole template pattern regardless of type or application.
2. Closer arms: Non-handed forged steel.
3. Closer size: Provide sized closers.
4. Provide all-weather fluid to eliminate seasonal adjustment of closer speed.
5. Powder coat closer body, arm, and adapter plate or pre-treat closer body, arm, and adapter plate with rust-inhibiting coating before painted finish is applied.

2.04 MANUFACTURERS

A. Basis of Design:
1. Ives Ingersoll-Rand Security Technologies, 11819 N. Pennsylvania St., Carmel, IN 46032 1-317-810-3700
2. Schlage, 11819 N Pennsylvania St, Carmel, IN 46032 1-317-810-3700
3. LCN Closers, 121 W. Railroad Ave., PO Box 100, Princeton, IL 61356 1-800-526-2400
4. Or approved equal.

2.05 FINISH HARDWARE SCHEDULE

A. Group 1
1. Hinge: 3ea – 5BB1 4.5x4.5 NRP (Finish – 652)
2. Classroom Lock: 1ea – L9070HD 06A (Finish – 626)
3. Permanent Core supplied by WCDPW (Finish – 626)
4. Surface Closer: 1ea – 4040XP EDA (Finish – 689)
5. Wall Stop: 1ea – WS401CVX (Finish – 626)
6. Threshold: 1ea – 656A MSLA-10 (Finish – AL)
7. Silencer: 3ea – SR64 (Finish – GRY)

2.05 KEYING

A. Continue existing key system established for WCDPW.
1. Stamp key symbol on one side of key, and "Do Not Duplicate" on other side of key.
3. Furnish one copy of factory bitting list to facility.
4. Factory key cylinders.
5. Furnish 3 cut keys for each master key.
6. Furnish 7 cut keys for each keyed lockset.
7. These cut key quantities are for bidding purposes only. Actual number of cut keys required will be determined at keying meeting.
8. When lockset and cylinder are by different manufacturers, identify and furnish correct cylinder cam to operate lockset.
9. Provide compression rings and spacers to achieve proper spacing relationship between cylinder and face of door.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine doors and frames and related items for conditions such as, but not limited to, incorrect handing, hardware preparation, misaligned lock and strike preparations, that would prevent proper application of finish hardware. Do not proceed until defects are corrected.

B. Report conditions or hardware applications that are incorrect to the WCDPW.

3.02 INSTALLATION

A. Do not proceed with installation of finish hardware prior to attending referenced pre-installation conference.

B. Installation Sequence: Use proper installation sequence, i.e., install coordinators, and overhead stops and holders before surface mounted door closers.

C. Install hardware in accordance with manufacturer's printed installation instructions, and adjust for smooth operation, free of sticking, binding or rattling.
1. Template surface overhead stops and holders for proper operation
2. Template and adjust closers for proper operation.

D. Use proper tools and methods to prevent scratches, burrs or other defacement.

E. Threshold Installation:
1. Drill holes 3 inches from each end of threshold and intermediate holes 12 inches maximum o.c. for required fasteners. Prepare holes for countersunk fasteners.
2. Level and align thresholds with frames and doors. Where required, use non-corrosive shims.
3. Secure thresholds to substrate with countersunk fasteners.

F. Door Bottom Installation:
1. Mount sweep type door bottom protection/drip caps on exterior side of doors.
2. Before mounting apply Type 2 sealant on the back side of bearing surface. Secure to door with required fasteners.

G. Gasket Installation:
1. Install continuous stripping at each opening without unnecessary interruptions.
2. Where fasteners are required, secure fasteners for stripping and seals so they will not work loose during door operation. Exposed heads of fasteners shall be free of sharp edges.
3. Coordinate meeting stile gasket with hardware before installation.
4. Install units plumb and level at the optimum location to maintain a permanent effective seal.

H. After installation, cover and protect hardware to prevent damage during remaining construction. Remove protection upon completion of construction.

3.03 LOCATIONS

A. Locate hardware as follows:
   1. Door Closers: Template for maximum door swing allowed by wall placement and jamb conditions. Where overhead stop prevents door from swinging to wall, template the closer to exceed degree of opening allowed by overhead stop.
   2. Protection Plates: 1/8 inch from door bottom.
   3. Wall Stops: Centerline of bumper to match centerline of locking trim.

3.04 FIELD QUALITY CONTROL

A. Post Installation Review: After hardware is adjusted for proper operation, WCDPW will hold a Post-Installation Review with the Contractor, Hardware Designer, Company Field Advisors, Hardware Distributor and Hardware Installers.
   1. Physically inspect to verify proper application, installation, adjustment and operation of finish hardware, and in particular that:
      a) Latches engage freely without binding. Filing of strike plates to relieve latch bind is not acceptable.
      b) Closers are adjusted for proper spring power; sweep speed, latching speed; and hydraulic back check.
      c) Locations and proper attachment of installed protective hardware are as specified.
      d) There is no field modification of fasteners.
      e) Damaged fasteners are replaced.
   2. Defective hardware is repaired or replaced.
   3. Hardware is to be left clean and free from disfigurement.

B. Turn referenced Operations and Maintenance Manuals over to Facility through WCDPW.

END OF SECTION

SECTION 092116

GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes:
   1. Moisture- Resistant Gypsum Board for interior restroom partition walls and ceiling.

B. Related work specified elsewhere:
   1. Cold Formed Metal Framing: Section 054000
   2. Ceramic Tile: Section 093013
   4. Construction Painting: Section 099101

1.03 DEFINITIONS

A. Sheet Steel Gages: US Standard.

B. Gypsum Board Terminology: ASTM C 11 - Standard Terminology Relating to Gypsum and Related Building Materials and Systems.

1.04 SUBMITTALS

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

B. Samples:
   1. Steel Framing: 12 inches long, each component specified.
   2. Gypsum Board: 12 inches square, each type specified.
   3. Fasteners: 10 each type specified.
   4. Adhesive: 1 pint.

1.05 SYSTEMS REQUIREMENTS

A. Performance Requirements: Fabricate and install systems as indicated but not less than that required to comply with ASTM C754 under the following conditions:
   1. Gypsum board partitions:
      a. Standard systems: Maximum deflection of l/240 of partition height.

b. Systems to receive water resistant gypsum board or backer board: Maximum deflection of l/360 of partition height.

2. Interior suspended ceilings and soffits: Maximum deflection of l/360 of distance between supports.

B. Fire Resistance Ratings: Where fire resistance classifications are indicated, provide materials and application procedures identical to those listed by UL or tested according to ASTM E119 for type of construction shown.

C. Acoustical Ratings: Where sound ratings are indicated, provide materials and application procedures identical to those tested by manufacturer to achieve Sound Transmission Class (STC) scheduled or indicated in accordance with ASTM E90.

1.06 QUALITY ASSURANCE

A. Fire Resistance Rated Applications: Provide UL listed or ASTM E 119 tested materials, accessories, and application procedures to comply with the rating, UL Design Number, or Gypsum Association File Number indicated.

B. Sound Transmission Class (STC) Rated Applications: Provide materials and installation procedures identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413.

C. Single Source Responsibility: Obtain components for gypsum board shaft-wall assemblies from a single manufacturer for each type of assembly required.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

1.08 PROJECT CONDITIONS

A. Environmental Requirements: Comply with gypsum board manufacturer's printed temperature and ventilation requirements during application and finishing. Ventilate installation areas to relieve excess moisture.

PART 2 PRODUCTS

2.01 FRAMING

A. Studs, Tracks, and Furring: See Section 054000 Cold Formed Metal Framing.

2.02 CEILING AND SOFFIT SUPPORT MATERIALS

A. Hanger Anchorage Devices: Screws, clips, bolts or other devices compatible with indicated structural anchorage for ceiling hangers and whose suitability has been proven through standard construction practices or by certified test data.

B. Powder-Actuated Fasteners in Concrete: Fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers, and with capability to sustain, without failure, a load equal to 10x calculated loads.

C. Post-tensioned Concrete Slabs:
1. For inserts placed in post tensioned concrete work, maintain 3 inch clearance between inserts and prestressing strands.
2. If insert is in conflict with strand, insert must be moved to avoid strand. Do not move strands to avoid inserts.

D. Hangers:
1. Steel wire or rods, sizes to comply with requirements of ASTM C754 for ceiling or soffit area and loads to be supported.
2. Wire: ASTM A 641, soft, Class 1 galvanized.
3. Rods and flats:
   a. Mild steel components.
   b. Finish: Galvanized or painted with rust inhibitive paint for interior work; galvanized for exterior work.

E. Proprietary Framing System:
1. Framing system for gypsum board panels consisting of cold-rolled steel members conforming to ASTM C635, with exposed surfaces finished in manufacturer's standard enamel paint finish.
2. Components: Main tees, furring cross channels, furring cross tees, and cross tees.
3. Accessories:
   a. U-shaped channel molding.
   b. Galvanized carbon steel (12 ga.) hanger wire.
   Acceptable product: Equivalent to Drywall Suspension System by USG or approved equal.

   USG Drywall Suspension Systems – Commercial quality, cold-rolled steel, hot-dipped galvanized finish:

   Main Tees: Fire-Rated Heavy Duty classification 1-1/2" high x 144" long, integral reversible splice with knurled face. (DGLW-26 1-1/2" Face)

Cross Members: Fire-Rated members with knurled face. Cross Tees: DGLW-424 cross tee 1-1/2" high x 48" long with 1-1/2" wide face; quick release cross tee ends for positive locking and removability without tools.

Accessory Cross Tees: Cross tees must have knurled faces and quick release cross tee ends for positive locking and removability without tools.
DGL-424 Fire-Rated 1-1/2" high x 48" long with 15/16" face
DGL-824 Non Fire-Rated 1-1/2" high x 96" long with 15/16" face

Wall Moldings: Single web with knurled face
(DGWM-24 1-1/2" x 1" x 144" long wall molding)
(DGCM-25 1-9/16" x 1" x 144" channel molding)

2.02 GYPSUM BOARD

A. Moisture-Resistant Gypsum Board for interior gypsum partitions at restroom and other interior use: ASTM C 1396; long edges as follows:
   1. Long Edges: Tapered.
   2. Long Edges: Tapered with beveled or rounded edges.

2.03 FASTENERS

A. Steel Drill Screws: ASTM C 1002; gypsum board manufacturer's recommended types and sizes for substrates involved.

B. Laminating Adhesive: Gypsum board manufacturer's recommended type for substrates involved.

C. Expansion Anchors: Anchor bodies AISI 1018 or 12L14, of dimensions indicated; with nuts, ASTM A 563; and flat washers. Expansion sleeves AISI 1010, of dimensions indicated; with bolts, SAE Grade 5; and flat washers.

D. Toggle Bolts: Tumble wing type.
   1. Wing Body: AISI 1008-1010 or equivalent cold rolled steel.
   2. Trunnion Nut: 1/4 inch thru 3/8 inch AISI 1010 steel; 1/2 inch Zamac alloy.
   3. Screw: Carbon steel.

E. Self Threading Masonry Screws: Zinc plated; Tapcon Fasteners by ITW Buildex 1349 West Bryn Mawr Ave. Itasca, IL 60143, (800) 284-5339 or approved equal.

2.04 TRIM

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized steel or extruded vinyl.
2. Shapes:
   a. Cornerbead: Use at outside corners.
   b. Bullnose Bead: Use where indicated.
   c. LC-Bead: J-Shaped, exposed long flange receives joint compound. Use at exposed panel edges.
   d. L-Bead: L-shaped, exposed long leg receives joint compound with tear away bead. Use where gypsum board abuts or intersects dissimilar material.
   e. U-Bead: J-shaped, exposed short flange does not receive joint compound. Use where indicated.
   f. Expansion (Control) Joint: Use where indicated.

B. Exterior Trim: ASTM C 1047.
1. Materials: Hot-dip galvanized steel.
2. Shapes:
   a. Cornerbead: Use at outside corners.
   b. LC-Bead: J-shaped, exposed long flange receives joint compound. Use at exposed panel edges.
   c. Expansion (Control) Joint: One-piece, with V-shaped slot and removable strip covering slot opening.

2.05 METAL SUSPENSION SYSTEM, GENERAL

A. Retain this article with "Metal Suspension System" Article.

B. Metal Suspension-System Standard: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

   a. Type: Postinstalled expansion anchors.

   b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 for Class SC 1 service condition.

   c. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Group 1 Alloy 304 or 316 for bolts; Alloy 304 or 316 for anchors.

2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.135-inch- diameter wire.

E. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

F. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch- thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch- diameter bolts.

G. Seismic Struts: Manufacturer's standard compression struts designed to accommodate lateral forces.

I. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical tiles in-place.

2.06 METAL SUSPENSION SYSTEM

A. Retain this article with "Metal Suspension Systems, General" Article.

B. Manufacturers: Subject to compliance with requirements, provide products by the following:

C. Basis-of-Design Product: Refer to drawings for Basis of Design products.

D. Direct-Hung, Double-Web Suspension System: Main and cross runners roll formed from and capped with cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G30 coating designation.

1. Structural Classification: Intermediate-duty system

2.07 JOINT TREATMENT MATERIALS

A. Joint Tapes: ASTM C 475; plain or perforated.

B. Joint Compound: ASTM C 475; gypsum board manufacturer's recommended dry powder or ready-mixed, either of the following:

1. One Compound Treatment: One compound for both bedding and finishing joints.
2. Two Compound Treatment: Compatible joint compounds; one compound for bedding and the other compound for finishing joints.

C. Special Edged Gypsum Board: Gypsum board manufacturer's special joint treatment materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates to which gypsum board system attaches or abuts, preset steel door frames, cast in anchors, and structural framing, with installer present for compliance with requirements for installation tolerances and other conditions affecting performance of gypsum board system construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 CONSTRUCTION TOLERANCES

A. Do not exceed 1/8 inch in 8 feet variation from plumb or level in any exposed line or surface, except at joints between boards do not exceed 1/16 inch variation between planes or abutting edges or ends. Shim as required to comply with specified tolerances.

3.03 NOT USED

3.04 GYPSUM BOARD INSTALLATION

A. Install flattened expanded metal mesh in accordance with the manufacturer's printed instructions.
1. Install flattened expanded metal mesh in the most economical direction, of maximum panel sizes to minimize joints and the use of small pieces.
2. Use minimum number of fasteners required to hold panels in place until the gypsum board is installed.

B. Install gypsum board in the most economical direction, of maximum lengths to minimize end butt joints. Where unavoidable, locate end butt joints as far from center of walls or ceilings as possible.

C. Install gypsum board with face side out. Butt boards together at edges and ends over firm bearing with not more than 1/16 inch of open space between boards. Do not force into place.

D. Fasteners: Fasten gypsum board to supports and furring with steel drill screws of required size and spacing as recommended by the gypsum board manufacturer.
   1. Multiple-layer Work:
      a. Mechanically fasten both layers.
      b. Multiple-layer Work: Laminate second layer to base layer with adhesive. Provide temporary nails for removal after drying or permanent screws for temporary support of second layer.
      c. Stagger vertical joints in multiple layer Work. Offset joints not less than 10 inches.

E. Provide additional framing and blocking required to support gypsum board at openings and cutouts.

F. Form control joints in gypsum board where indicated. Allow 1/2 inch continuous opening between boards to allow for insertion of control joint trim.

G. Metal Supports: Provide "floating" interior Lt Gauge angle construction between gypsum board at interior corners.

H. Reinforce joints formed by tapered edges, butt edges, and interior corners or angles with joint tape.

3.05 TRIM INSTALLATION

A. Coordinate installation of trim progressively with gypsum board installation where trim is of type required to be installed prior to, or progressively with installation of gypsum board.

B. Securely fasten trim pieces in accordance with manufacturer's printed instructions.

C. Install corner beads at external corners. Install LC-Bead (J-Bead) beads at unprotected (exposed) edges and where gypsum board abuts dissimilar materials. Use single unjointed lengths unless otherwise approved by the Director.
   1. Miter corners of semi-finishing type casing and trim beads.

D. Install control joint trim in accordance with ASTM C 840, where indicated.

E. Comply with joint compound manufacturer's recommended drying time for the relative humidity and temperature at time of application. Allow minimum of 24 hours drying time between applications of joint compound.

F. Except Type X Gypsum Board: Joint compound treatment is not required on gypsum board surfaces installed above suspended ceiling lines.

G. Type X Gypsum Board: Install joint and corner reinforcing and trim, and one coat of joint compound over joints, fastener heads, and metal flanges above suspended ceiling lines.

3.06 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damages surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, and concealed areas. See section 099101.
2. Level 2: Finish at interior partition: Joints and angles, provide tape embedded in joint compound and provide two separate applications of joint compound over all joints, angles, and fastener heads. Accessories shall be covered with two separate coats of joint compound. Joint compound to be smooth and free of tool marks and ridges, primed and painted. See section 099101.

E. Cementitious Backer Units: finish according to manufacturer's written instructions.

3.07 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces, stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged includes, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 28 00

CEMENT BOARD

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Cement board and accessories.

B. Related Sections specified elsewhere:
   1. Section 054000: "Cold Formed Metal Framing"
   2. Section 093013: "Ceramic Tile"

1.03 REFERENCES

A. American National Standards Institute (ANSI):
   1. A108.11, American National Standard for Interior Installation of Cementitious Backer Units.
   2. A118.1, American National Standard Specifications for Dry-Set Portland Cement Mortar.
   3. A118.4, American National Standard Specifications for Latex-Portland Cement Mortar.
   4. A118.9, Test Methods and Specifications for Cementitious Backer Units.
   5. A136.1, American National Standard Specifications for Organic Adhesives for Installation of Ceramic Tile.

B. American Society for Testing and Materials (ASTM):
   1. C 473, Test Methods for Physical Testing of Gypsum Panel Products.
   2. C 1325, Specification for Fiber-Mat Reinforced Non-Asbestos Cement Interior Substrate Sheets.
   3. C 1002, Specification for Steel Drill screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
   4. D 2394, Methods for Simulated Service Testing of Wood and Wood-Based Finish Flooring.

1.04 SUBMITTALS

A. Product Data: Manufacturers' specifications and installation instructions for each product specified.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packaging and Shipping: Have materials shipped in manufacturer's original packages showing manufacturer's name and product brand name.

B. Storage and Protection: Store materials inside and protected from damage by the elements. Protect ends, edges, and faces of cement boards from damage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Cement Board:
   a. National Gypsum Company PermaBase BRAND Cement Board
   b. Hardie Backer Board
   c. USG Tile Backer
   d. Or approved Equal

2.02 MATERIALS

A. Cement Board:
   1. Backer Board: Cementitious, water durable, board; surfaced with fiberglass reinforcing mesh on front and back; long edges wrapped; and complying with ANSI A118.9 and ASTM C 1325 (PermaBase BRAND Cement Board).
      a. Thickness: ½ in., 5/8 in.
      b. Width: 2 ft. 8 in., 3 ft., or 4 ft.
      c. Length: 4 ft., 5 ft., 6 ft., or 8 ft.
      d. Edges: Tapered.
      e. Compressive Strength: Not less than 2250 lbs. per sq. in. when tested in accordance with ASTM D 2394.
      f. Water Absorption: Not greater than 8 percent when tested for 24 hours in accordance with ASTM C 473.
   2. Fasteners:
      a. Nails: 1-1/2-in. long, hot dipped galvanized, and in accordance with FS FF-N-105B, Type 2, Style 20.
      b. Screws: Hi-Lo thread screws (No. 8) wafer head, corrosion-resistant, 1-1/4 in. or 1-5/8 in. long, and complying with ASTM C 1002.
   3. Joint Treatment:
      a. Tape: Alkali-resistant fiberglass mesh tape intended for use with cement board.
   4. Bonding Materials:
      a. Mortar: Dry-set portland cement mortar in accordance with ANSI A118.1.
      b. Mortar: Latex-portland cement mortar in accordance with ANSI A118.4.

c. Adhesive: Organic adhesive in accordance with ANSI A136.1, Type 1.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: In accordance with the following reference standards and manufacturer's recommendations: ANSI A108.11.

END OF SECTION

SECTION 093013

CERAMIC TILE

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Work Included: This Section specifies the following items:

1. Bathroom wall tile.
2. Waterproof membrane for thin-set tile installations.
3. Crack-suppression membrane for thin-set tile installations.
4. Surface preparation for tile and accessories.

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 092800 - CEMENT BOARD
2. Section 079200 - JOINT SEALERS; sealing of expansion, contraction, control, and isolation joints in tile surfaces.
3. Section 102800 - TOILET AND BATH ACCESSORIES
4. Section 224100 - PLUMBING FIXTURES

1.02 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum 0.6.
2. Step Treads: Minimum 0.6.
3. Ramp Surfaces: Minimum 0.8.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

C. Samples for Verification:

1. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least 12 inches square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work. Include sealant specified in Section 079200 - JOINT SEALERS, in color approved for completed work.
2. Full-size units of each type of trim and accessory for each color and finish required.
3. Metal edge strips in 6-inch lengths.

D. Qualification Data: For Installer.

E. Material Test Reports: For each tile-setting and -grouting product.

F. Installation Bonding Report: Including dates sounding test performed and remedial action taken.

1.04 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain all tile of same type and color or finish from one source or producer.
1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
1. Waterproofing.
2. Joint sealants.
3. Cementitious backer units.
4. Metal edge strips.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquid additives in unopened containers and protected from freezing.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.01 TILE SCHEDULE

A. Wall and Cove Base Installation: Interior cove base installation over sound, dimensionally stable masonry or concrete; thin-set mortar; TCA W202 and ANSI A108.5.

1. Tile Type: Glazed ceramic tile as selected by Engineer.
2. Thin-Set Mortar: Latex-Portland cement mortar.
3. Grout: Polymer-modified unsanded grout.
4. Joint Width: 1/16 inch.
5. Color: See Interior Finish Schedule on Contract Drawings.

2.02 PRODUCTS, GENERAL

B. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements, unless otherwise indicated.

C. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in this Section.

D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.

F. Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes selected from manufacturer's standard shapes.

G. Waterproofing and Crack Suppression Membranes: Manufacturer's standard product that complies with ANSI A118.10.

H. Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

I. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

J. Tiles including cove, wainscot, bullnose, angles, strips, and coved base shall be provided as indicated on Contract Drawings.

1. Available Products:
   a. Dal Tile
   b. American-Olean
   c. Mosaic Tile Company
   d. Contractor must submit any product not specified a minimum ten days before the bid date to the Engineer in order for product to be considered for approval. The Engineer will notify Contractor, in writing, of decision to accept or reject request.

2.02 ELASTOMERIC SEALANTS

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Section 07920 - JOINT SEALANTS.

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Available Products or equal:
   a. Dow Corning Corporation; Dow Corning 786.
   b. GE Silicones; Sanitary 1700.
   c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
   d. Tremco, Inc.; Tremsil 600 White.

D. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.

1. Available Products or equal:
   a. Bostik; Chem-Calk 550.
   b. Mameco International, Inc.; Vulkem 245.
   c. Pecora Corporation; NR-200 Urexpan.
   d. Tremco, Inc.; THC-900.

2.03 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards, compressive strength requirements and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

D. The latex mortars shall be resistant to freeze/thaw cycle, thermal shock and vibration. Setting materials for toilet room shall be resistant to urine, acids alkali, petroleum distillates, solvents, and floor wastes.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.

2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.

3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Engineer.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Provide concrete substrates for tile floors that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.

1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.

2. Remove protrusions, bumps, and ridges by sanding or grinding.

C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.03 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials, to methods indicated in ceramic tile installation schedules, and resistance to deleterious substances.

B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.

C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.

F. Lay out tile wainscots to next full tile beyond dimensions indicated.

G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.

2. Prepare joints and apply sealants to comply with requirements in Section 07920 - JOINT SEALANTS.

H. Grout tile to comply with requirements of the following tile installation standards:

1. For ceramic tile grouts (sand-Portland cement; dry-set, commercial Portland cement; and latex-Portland cement grouts), comply with ANSI A108.10.

2. For chemical-resistant epoxy grouts, comply with ANSI A108.6.

I. At showers, tubs, and where indicated, install cementitious backer units and treat joints to comply with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.04 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANE INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.

B. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.

C. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.05 NOT USED

3.06 WALL TILE INSTALLATION

A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.

3.07 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed. After seven days, cover areas subject to construction traffic with heavy cardboard.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 096513

RESILIENT WALL BASE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY:

A. This section includes the following:
   1. Vinyl Wall Base for new interior partitions at lower level.

B. RELATED WORK SPECIFIED ELSEWHERE

   1. Section 079200 Joint Sealers.
   2. Section 092116 Gypsum Board Systems.
   3. Section 092800 Cement Board Systems.
   4. Section 099101 Construction Painting.

1.03 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

A. Provide vinyl wall base by one manufacturer, including adhesive.

B. If required, provide wall base material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory:

   a. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I.

   b. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.04 SUBMITTALS

A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions for wall base.

B. Submit the manufacturer's standard samples showing the required colors for wall base.

C. Submit the manufacturer's certification that the wall base has been tested by an independent laboratory and complies with the required fire tests.

1.05 ENVIRONMENTAL CONDITIONS

A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.

B. Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Do not stack skids or other materials on wall base. Store wall base, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

C. Maintain a minimum temperature in the spaces to receive the wall base of 65°F (18°C) and a maximum temperature of 100°F (38°C) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F (13°C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

D. Install wall base after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the wall base. Do not install wall base over concrete walls until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

PART 2 PRODUCTS

2.01 WALL BASE MATERIALS

A. **Basis of design:**

1. Provide Armstrong Color-Integrated Vinyl Wall Base, or approved equal, to match existing wall base color and available from Armstrong World Industries, Inc., or approved equal, having a nominal total thickness of 0.080 in. (2.0 mm), 6 in. (15.24 cm) high, meeting the requirements of ASTM F 1861, Type TV - Vinyl, Thermoplastic, Group 1 - Solid, Style A – Straight. The material shall consist of a composition of polyvinyl chloride resin binder, fillers and pigments.

2.02 ADHESIVES

A. **Basis of design:**

1. Provide Armstrong S-725 Wall Base Adhesive, or approved equal, at the wall base as recommended by the wall base manufacturer.

B. Provide a solvent-based contact adhesive to bond wall base to outside corners.

2.03 ACCESSORIES

A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide Armstrong S-184 Fast-Setting Cement-Based Patch and Skim Coat, or as recommended by manufacturer and approved by WCDPW.

B. For patching and smoothing gypsum plaster/drywall substrates above grade, provide Armstrong S-172 Floor Patch.

C. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

B. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.

C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.02 PREPARATION

A. Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with Fast-Setting Cement-Based Patch and Underlayment as recommended by the flooring manufacturer.

B. Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the wall base manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for wall base. Avoid organic solvents.

C. Perform Bond Tests as described in publication F-5061, and following manufacturer's recommendations, to determine if surfaces are dry; free of curing and

hardening compounds, old adhesive, and other coatings; and ready to receive wall base.

D. Clean wall surfaces to be covered immediately before the application of wall base. Make subfloor free from dust, dirt, grease, and all foreign materials.

3.03 INSTALLATION OF WALL BASE

A. Install wall base in strict accordance with the latest edition of manufacturer's installation guide.

B. Apply resilient top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

C. Follow manufacturer's recommendations for the installation of inside and outside corners to maximize straight lengths of vinyl wall base.

D. Form inside corners on job from straight pieces of maximum lengths possible by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Skive back of base where necessary to produce snug fit to substrate.

E. Fill voids with plastic filler along the top edge of the resilient wall base on masonry surfaces or other similar irregular substrates.

3.04 CLEANING AND PROTECTION

A. Perform initial maintenance according to the latest edition of "Armstrong Guaranteed Installation System," F-5061.

B. Protect installed wall base as recommended by the flooring manufacturer against damage from other trades or the placement of fixtures and furnishings. (See Finishing The Job in "Armstrong Guaranteed Installation System," F-5061.)

END OF SECTION

SECTION 099101

CONSTRUCTION PAINTING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This section includes surface preparation, field and factory painting of exposed interior items and surfaces, as detailed herein.

B. Paint exposed surfaces. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. Painting includes field painting, as follows:

1. Interior Field Applied Paints 1: Gypsum wallboard at new interior partition.
2. Interior Field Applied Paints 2: Hollow metal doors and frames at new interior partition.
3. Interior Field Applied Paints 3: Patched concrete wall locations.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 081102 Steel Doors and Frames
B. Section 092116 Gypsum Board Assemblies

1.04 DEFINITIONS

A. The word "paint" in this Section refers to substrate cleaners, fillers, sealers, primers, undercoats, enamels, stains, varnishes and other first, intermediate, last or finish coatings.

B. The word "primer" in this Section refers to substrate cleaners, fillers, sealers, undercoats, and other first or intermediate coats beneath the last or finish coating.

C. The words "finish paint" in this Section refers to the last or final coat and previous coats of the same material or product directly beneath the last or final coat.

D. Finish Paint Systems: Finish paint and primers applied over the same substrate shall be considered a paint system of products manufactured or recommended by the finish coat manufacturer.
   1. Finish paint products shall meet or exceed specified minimum physical properties.

1.05 SUBMITTALS

A. Painting Schedule: Cross-referenced Painting Schedule listing all interior substrates to be painted and specified finish paint type designation; product name and manufacturer, recommended primers and product numbers, and finish paint color designation for each substrate to be painted.

   1. Designate interior substrates by building name and number, floor, room name and number, and surface to be painted.

B. Product Data Sheets: Manufacturer's published product data sheets describing the following for each finish paint product to be applied:
   1. Percent solids by weight and volume, solvent, vehicle, weight per gallon, ASTM D 523 gloss/reflectance angle, recommended wet and dry film thickness, volatile organic compound (VOC) content in lbs/gallon, product use limitations and environmental restrictions, substrate surface preparation methods, directions and precautions for mixing and thinning, recommended application methods, square foot area coverage per gallon, storage instructions, and shelf-life expiration date.
   2. Manufacturer's recommended primer for each finish paint product and substrate to be painted.
   3. Manufacturer's complete range of available colors for each finish paint product to be applied.

C. Finish Paint Samples: Two finish paint samples applied over recommended primers for each substrate to be painted.
   1. Samples shall be in the designated color and specified ASTM D 523 reflectance.
   2. Label each sample with the following information:
      a. Project number and Painting Schedule designation describing substrate location represented by the sample.
      b. Finish paint and primer manufacturer, product names and numbers, finish paint color and reflectance.
   3. Leave a 1 inch wide exposed strip of unpainted substrate, primer, intermediate coatings, and finish paint specified.
   4. Sample Sizes:
      a. Wall, Ceiling, and Floor Substrates: 12 inch square panels.
      c. Concrete Substrates: 4 inch square blocks.
      d. Sheet Metals: 4 inch by 8 inch flat sheets.
      e. Bar and Tubular Metals: 8 inch long bars or tubular stock.

D. Quality Control Submittals:

1. Test Reports: Furnish certified test results from an independent testing laboratory showing that products submitted comply with the specifications, if requested by the Facility's Representative.
2. Certificates: Furnish certificates of compliance required under QUALITY ASSURANCE Article.

1.06 QUALITY ASSURANCE

A. Volatile Organic Compounds (VOCs) Regulatory Requirements: Chapter III of Title 6 of the official compilation of Codes, Rules and Regulations of the State of New York (Title 6 NYCRR), Part 205 Architectural Surface Coatings.
   1. Certificate of Compliance: List of each paint product to be delivered and installed. List shall include written certification stating that each paint product listed complies with the VOC regulatory requirements in effect at the time of job site delivery and installation.

B. Container Labels: Label each product container with paint manufacturer's name, product name and number, color name and number, thinning and application instructions, date of manufacture and shelf-life expiration, required surface preparation, recommended coverage per gallon, wet and dry film thickness, drying time, and clean up procedures.

C. Field Examples:
   1. Prior to on-site painting, at locations designated by the Facility's Representative, apply field examples of each paint type to be applied.
   2. Field examples to be applied on actual substrates to be painted and shall duplicate earlier approved paint samples.
      a. Interior field examples to be applied in rooms and spaces to be painted with the same products.
      b. Field Example Minimum Wet and Dry Film Thickness: As indicated on approved product data sheet.
      c. Application: Apply each coat in a smooth uniform wet mil thickness without brush marks, laps, holidays, runs, stains, cloudiness, discolorations, nail holes and other surface imperfections.
         1) Leave a specified exposed width of each previous coat beneath each subsequent coat of finish paint and primer.
      d. Use of Field Examples: Field examples shall serve as a quality control standard for acceptance or rejection of painting Work to be done under this Section.

   3. Field Example Sizes:
      a. Wall Examples: 200 square feet with 2 foot wide strips.
      b. Door and Frame Examples: One door and frame with 12 inch wide horizontal strips.

4. Do not begin applying paints represented by field examples until examples have been reviewed and approved by WCDPW's Representative.
    a. Protect and maintain approved field examples until all painting work represented by the example has been completed and approved.

D. Compatibility of Paint Materials: Primers and intermediate paints shall be products manufactured or recommended by the finish paint manufacturer.

E. Performance Criteria:
1. The following criteria are REQUIRED for products included in this section:
    a. Paints and coatings manufactured within 500 miles (by air) of the project site shall be documented in accordance with Submittal Requirements of Item 1.03.F.
    b. Architectural paints and coatings applied to interior walls and ceilings must not exceed the volatile organic compound (VOC) content limits established in Green Seal Standard GS-11, Paints.
    c. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates must not exceed the VOC content limit established in Green Seal Standard GC-03, AntiCorrosive Paints.
2. Volatile Organic Compounds: The VOC concentrations (in grams per liter) of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24 and the standards referenced in 1.04.E.1.
    a. Interior Paints and Coatings:
        1. Non-flat: 150
        2. Flat: 50
    b. Anti-Corrosive Paints (if used in interior applications):
        1. Gloss: 250
        2. Semi-gloss: 250
        3. Flat: 250
    c. Exclude water and tinting color added at the point of sale in the calculation of VOC concentrations.
3. Chemical Component Limitations: Aromatic Compounds: the product must contain no more than 1.0% by weight of the sum total of aromatic compounds. Testing for the concentration of these compounds will be performed if they are determined to be present in the product during a materials audit.
4. Chemical Component Limitations, Other Chemicals: The manufacturer shall demonstrate that the following chemical compounds are not used as ingredients in the manufacture of the product:
    a. Halomethanes: Methylene chloride.
    b. Chlorinated ethanes: 1,1,1-trichloroethane.
    c. Aromatic solvents: benzene, toluene (methylbenzene), ethylbenzene.
    d. Chlorinated ethylenes: Vinyl chloride.
    e. Polynuclear aromatics: Naphthalene.

f. Chlorobenzenes: 1,2-dichlorobenzene.
g. Phthalate esters: Di (2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, diethyl phthalate, dimethyl phthalate.
h. Miscellaneous semi-volatile organics: Isophorone.
i. Metals and their compounds: antimony, cadmium, hexavalent chromium, lead, mercury
j. Preservatives (antifouling agents): formaldehyde
k. Ketones: methyl ethyl ketone, methyl isobutyl ketone
l. Miscellaneous volatile organics: acrolein, acrylonitrile

5. Where paints will bond with Sprayed Fire Resistant Materials (SFRM), paints or encapsulants shall be field tested in accordance with ASTM E 736. Bond tests conducted shall indicate minimum average bond strength of 80% and a minimum individual bond strength of 50%, when compared to the bond strength of SFRM as applied to clean uncoated 1/8" thick (3-mm) steel plate.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to the Site in original, unopened containers and cartons bearing manufacturer's printed labels. Do not deliver products which have exceeded their shelf life, are in open or damaged containers or cartons, or are not properly labeled as specified.

B. Storage and Handling: Store products in a dry, well ventilated area in accordance with manufacturer's published product data sheets. Storage location shall have an ambient air temperature between 45 degrees F and 90 degrees F.

1.08 PROJECT CONDITIONS

A. Environmental Requirements:
1. Ambient Air Temperature, Relative Humidity, Ventilation, and Surface Temperature: Comply with paint manufacturer's published product data sheet or other printed product instructions.
2. If paint manufacturer does not provide environmental requirements, use the following:
a. Ambient Air Temperature: Between 45 degrees F and 75 degrees F.
b. Relative Humidity: Below 75 percent.
c. Ventilation: Maintain the painting environment free from fumes and odors throughout the Work of this Section.
d. Surface Temperature: At least 5 degrees F above the surface dewpoint temperature.
3. Maintain environmental requirements throughout the drying period.

B. Items are not to be painted unless specified, noted or directed in Contract Documents.

1.09 EXTRA MATERIALS

A. Provide extra finish paint materials, from the same production run as paints to be applied, in the following quantities for each color installed:
   1. Paint Type Interior Paints 1: Four gallons, each type.
   2. Paint Type Interior Paints 2: Four gallons, each type.
   3. Paint Types Interior Paints 3: Four gallons, each type.

PART 2 PRODUCTS

2.01 PAINT MANUFACTURERS

A. Where noted, the following finish paint manufacturers produce the paint types specified.
   1. Benjamin Moore and Co., 51 Chestnut Ridge Rd., Montvale, NJ 07645, (201) 573-9600.
   2. PPG Industries, One PPG Place, Pittsburgh, PA 15272, (412) 434-3131.
   3. Sherwin-Williams Co., Cleveland, OH 44101, (800) 321-8194.
   4. Valspar Corp., 1401 Severn St., Baltimore, MD 21230, (800) 638-7756.
   5. Or approved equal.

2.02 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

   1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: To match existing or as noted on Contract Drawings.

2.03 INTERIOR FIELD APPLIED PAINTS 1:

A. INTERIOR PRIMER

1. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.

   a. Benjamin Moore; ECO SPEC Interior Latex Primer Sealer 231: Applied at a dry film thickness of not less than 1.0 mil.

   b. Or approved equal.

B. INTERIOR FINISH COAT

1. Interior Latex Semi Gloss Paint: Factory-formulated Latex Semi Gloss Paint for Interior application.

   a. Basis of Design: Benjamin Moore; ECO SPEC Interior Latex Semi Gloss Enamel 224 Semi Gloss Finish: Applied at a dry film thickness of not less than 1.4 mils.

   b. Or approved equal.

2.04 INTERIOR FIELD APPLIED PAINTS 2:

A. INTERIOR PRIMER: Factory formulated metal primer, also suitable for application over applied fireproofing sealer and as recommended by Applied Fireproofing manufacturer.

1. Basis of Design: Benjamin Moore; IronClad Latex Low Lustre Metal Enamel No. 363 Applied at a dry film thickness of not less than 1.6 mils.

2. Or approved equal.

B. INTERIOR FINISH COAT: Factory formulated semi-gloss acrylic-latex interior enamel.

1. Basis of Design: Benjamin Moore; ECO SPEC Interior Latex Enamel W224.

2. Or approved equal.

2.05 INTERIOR FIELD APPLIED PAINTS 3:

A. INTERIOR PRIMER

1. Latex Primer: PrepRite Block Filler, B25W25 White – Basis of Design

2. Or approved equal.

B. INTERIOR 1st COAT

1. ProMar 200 Zero VOC Interior Latex Semi-Gloss– Basis of Design

2. Or approved equal.

C. INTERIOR 2nd COAT

1. ProMar 200 Zero VOC Interior Latex Semi-Gloss – Basis of Design

2. Or approved equal.

D. Color shall match existing wall color.

2.06 PAINT PRODUCTS (as required per application)

A. Bedding Compound: Water based pre-mixed gypsum wallboard joint compound.

B. Cleaning Solvents: Low toxicity with flash point in excess of 100 degrees F.

C. Color Pigments: Pure, nonfading, finely ground pigments with at least 99 percent passing a 325 mesh sieve.
1. Use lime-proof color pigments on masonry, concrete and plaster.
2. Use exterior pigments in exterior paints.

D. Galvanizing Compound, Cold: Single component compound with 93 percent pure zinc in the dried film and meeting the requirements of DOD-P-21035A (NAVY).

E. Glazing Compound: ASTM C 669.

F. Masking Tape: Removable paper or fiber tape, self-adhesive and nonstaining.

G. Metal Filler: Polyester resin base autobody filler.

H. Mineral Spirits: Low odor type recommended by finish paint manufacturer.

J. Paint Stripper: As recommended by finish paint manufacturer.

K Spackling Compound: Water based pre-mixed plaster and gypsum wallboard finishing compound.

L. Stain Blocker, Primer-Sealer: As recommended by finish paint manufacturer.

M. Turpentine: ASTM D 13.

2.07 FINISH PAINT TYPES

A. Physical Properties:
   1. Specified percent solids by weight and volume, pigment by weight, wet and dry film thickness per coat, and weight per gallon are minimum physical properties of acceptable materials.
      a. Opaque Pigmented Paints: Physical properties specified are for white titanium dioxide base before color pigments are added.
      b. Specified minimum wet and dry film thickness per coat are for determining acceptable finish paint products. Minimum wet and dry film thickness per coat to be applied shall comply with approved finish paint manufacturer's product data sheets.
   2. Gloss or Reflectance: The following ASTM D 523 specified light levels and angles of reflectance:
      a. Flat: Below 15 at 85 degrees.
      b. Eggshell: Between 5 and 20 at 60 degrees.
      c. Satin: Between 15 and 35 at 60 degrees.
      d. Semigloss: Between 30 and 65 at 60 degrees.
      e. Gloss: Over 65 at 60 degrees.

B. Colors: Provide paint colors either shown on contract drawings or to be selected by Architect from finish paint manufacturers available color selections.
   1. Approved finish paint manufacturers to match designated colors of other manufacturers where colors have been shown on the contract documents.
   2. Safety Colors: Industry Standard ANSI Safety Colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to be prepared, primed, or painted for compliance with contract documents, required environmental conditions, manufacturer's product data sheets, product label instructions and other written requirements.
   1. Do not begin any phase of the work without first checking and verifying that surfaces and environmental conditions are acceptable for such work and that any earlier phase deficiencies and discrepancies have been properly corrected.
      a. The commencement of new work shall be interpreted to mean acceptance of surfaces to be affected.

3.02 PREPARATION

A. Protection: Cover and protect both surfaces to be painted and adjacent surfaces not to be painted from existing paint removals, airborne sanding particles, cleaning fluids and paint spills using suitable drop cloths, barriers and other protective devices.

1. Adjacent exterior surface protections include roofs, walls, landscaping, driveways and walkways. Interior protections include floors, walls, furniture, furnishings and electronic equipment.
2. Remove and replace removable hardware, lighting fixtures, telephone equipment, other devices and cover plates over concealed openings in substrates to be painted.
    a. Cover and neatly mask permanently installed hardware, lighting fixtures, cover plates and other devices which cannot be removed and are not scheduled for painting.
3. Schedule and coordinate surface preparations so as not to interfere with work of other trades or allow airborne sanding dust particle to fall on freshly painted surfaces.
4. Provide adequate natural or mechanical ventilation to allow surfaces to be prepared and painted in accordance with product manufacturer's instructions and applicable regulations.
5. Provide and maintain "Wet Paint" signs, temporary barriers and other protective devices necessary to protect prepared and freshly painted surfaces from damages until Work has been accepted.

B. Clean and prepare surfaces to be painted in accordance with specifications, paint manufacturer's approved product data sheets and printed label instructions. In the event of conflicting instructions or directions, the more stringent requirements shall apply.

1. Cleaners: Use only approved products manufactured or recommended by finish paint manufacturer. Unless otherwise recommended by cleaner manufacturer, thoroughly rinse with clean water to remove surface contaminants and cleaner residue

C. Surfaces:

1. Existing Interior Painted Surfaces: Thoroughly clean to remove dirt, soot, grease, mildew, chalkiness and stains using finish paint manufacturer's recommended spray-on liquid cleaner.
    a. Apply cleaner using hand-held wand applicator in accordance with product manufacturer's instructions. Thoroughly rinse and remove all residue with clean water.
    b. Remove loose, peeling, cracked and blistered paint by chipping, scraping, and sanding smooth with medium and fine sandpaper.
    c. Completely strip and remove existing paint films where shown on the drawings using approved methods. When approved, chemical strippers to be applied and rinsed or removed in accordance with product manufacturer's printed instructions.
    d. Fill surface holes and depressions with finish paint manufacturer's recommended filler and sand smooth to adjacent undisturbed edges.

c. Touch-up bare spots on previously painted surfaces with finish paint manufacturer's recommended primer.

f. Sand existing semigloss and gloss paint surfaces to a uniform smooth dull finish before painting.

g. Fill and sand smooth existing paint surface damages, depressions, ridges and other imperfections that will remain visible after new paints have been applied.

2. Steel Doors and Frames: Fill indentations and cracks with metal filler; sand smooth to match adjacent undamaged surfaces.

3. Gypsum Wallboard:

a. Fill cracks, holes, and other indentations smooth to adjacent surfaces using specified bedding, spackling, and finishing compounds.

b. Plaster: Scrape and sand smooth ridges, spills, nibs, and other surface projections.

c. Cement Plaster: Coat surfaces to be patched with a bonding agent. Patch cement plaster with an approved mortar patching mix and finish to match adjacent surface and texture.

d. Gypsum Wallboard: Fill and sand smooth minor bedding and finishing compound defects.

e. Vacuum and wipe surfaces free of all sanding residue and dust.

4. Other Substrates: See finish paint manufacturer's recommendations.

D. Painting Material Preparations:

1. Prepare painting materials in accordance with manufacturer's approved product data sheets and printed label instructions.

a. Stir materials before and during application for a consistent mixture of density. Remove container surface paint films before stirring and mixing.

b. Slightly tint first opaque finish coat where primer and finish coats are the same color.

c. Do not thin paints unless allowed and directed to do so in writing within limits stated on approved product data sheets.

3.03 APPLICATION

A. Environmental Conditions:

1. Water-based Paints: Apply when surface temperatures will be 50 degrees Fahrenheit to 90 degrees Fahrenheit throughout the drying period.

2. Other Paints: Apply when surface temperatures will be 45 degrees Fahrenheit to 95 degrees Fahrenheit throughout the drying period.

3. Apply exterior paints during daylight hours free from rain, snow, fog and mist when ambient air conditions are more than 5 degrees above the surface dewpoint temperature and relative humidity less than 85 percent.

a. When exterior painting is allowed or required during nondaylight hours, provide portable outdoor weather recording station with constant printout showing hourly to diurnal air temperature, humidity, and dewpoint temperature.

4. Exterior Cold Weather Protection: Provide heated enclosures necessary to maintain specified temperature and relative humidity conditions during paint application and drying periods.

B. Install approved paints where specified, or shown on the drawings, and to match approved field examples.
   1. Paint Applicators: Brushes, rollers or spray equipment recommended by the paint manufacturer and appropriate for the location and surface area to be painted.
      a. Approved minimum wet and dry film thicknesses shall be the same for different application methods and substrates.

C. Paint Type Coats To Be Applied: Unless specified otherwise by finish paint manufacturer's product data sheet, the number of coats to be applied for each paint type are as follows:
   1. Paint Types Exterior and Interior:
      a. New Unpainted Surfaces: Apply 1 coat of primer and 2 coats of finish paint, or as specified in order to achieve the specified thickness.
      b. Existing Painted Surfaces: See manufacturer's recommendations.

D. Surfaces: Unless otherwise specified or shown on the drawings, paint surfaces as follows:
   1. Interior Surfaces:
      a. Walls: Interior Paints 1
      b. Doors, Windows, Frames and Trim: Interior Paints 2
      c. Patched Concrete Wall: Interior Paints 3

   2. Ferrous Metal Door and Window Hardware: Unless otherwise noted, prime and paint to match adjacent doors, windows and frames.

3.04 FIELD QUALITY CONTROL

A. Paint Samples: Assist the WCDPW Representative in obtaining random one quart paint samples for testing at any time during the Work.
   1. Notify the WCDPW Representative upon delivery of paints to the Site.
   2. Furnish new one quart metal paint containers with tight fitting lids and suitable labels for marking.
      a. Furnish labor to thoroughly mix paint before sampling and provide assistance with sampling when required.

3.05 ADJUSTING AND CLEANING

A. Reinstall removed items after painting has been completed.
   1. Restore damaged items to a condition equal to or better than when removed. Replace damaged items that cannot be restored.

B. Touch up and restore damaged finish paints. Touch up and restoration paint coats are in addition to the number of specified finish paint coats.

C. Remove spilled, splashed, or spattered paint without marring, staining or damaging the surface. Restore damaged surfaces to the satisfaction of the Facility's Representative.

D. Remove temporary barriers, masking tape, and other protective coverings upon completion of painting, cleaning and restoration work.

END OF SECTION

SECTION 102800

TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract.

1.02 SUMMARY

A. Section Includes:
   1. Bathroom accessories.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

   1. Construction details and dimensions.
   2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
   3. Material and finish descriptions.
   4. Features that will be included for Project.
   5. Manufacturer's warranty.

B. Samples: Full size, for each accessory item to verify design, operation, and finish requirements.

   1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

   1. Identify locations using room designations indicated.

1.04 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.06 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.07 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices to prevent delaying the Work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

B. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

C. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

D. Mirrors: ASTM C 1503, Mirror Glazing Quality, tempered clear-glass mirrors, nominal 6.0 mm thick.

2.02 PRIVATE-USE BATHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Basco, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Franklin Brass by Liberty Hardware Manufacturing Corporation; a Masco company.
4. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
5. Ginger; a Masco company.
6. Seachrome Corporation.
7. Tubular Specialties Manufacturing, Inc.
8. Or approved equal.

B. Toilet Tissue Dispenser :
1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc. – B-4288, or approved equal.
2. Description: Surface-Mounted Multi-Roll Toilet Tissue Dispenser
3. Mounting: Surface mounted.

4. Capacity: Designed for a minimum 4-1/2- or 5-1/4" diameter tissue rolls.
5. Material and Finish: Stainless steel unit with stainless steel dispending mechanism.

C. Soap Dispenser
1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc. – B-4122, or approved equal.
2. Description: Surface-Mounted Soap Dispenser
3. Mounting: Wall mounted set as indicated on Contract Drawings.
4. Provide 40 oz refill cartridges.

D. Paper Towel Dispenser
1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc. – B-262, or approved equal.
2. Description: Surface Mounted Paper Towel Dispenser
3. Dispenser shall be key locked wall mounted dispenser. Holds 600 multifold towers. Provide one case of 125 count packages of hand towels.
4. Mount: Wall mounted set as indicated on Contract Drawings.

E. Wall Mounted Mirror
1. Basis-of-Design Product: Bobrick Washroom Equipment, Inc. – B-290, or approved equal.
2. 18 inch x 36 inch glass mirror in stainless steel angle frame.
3. Mounting: Wall mounted set as indicated on Contract Drawings.

F. Hand Sanitizer Dispenser
1. Basis-of-Design Product: GOJO Wall-Mount Dispenser – H-1175, or approved equal.
2. Mounting: Wall mounted set as indicated on Contract Drawings.
3. Provide 40 oz refill cartridges.

G. Waste Basket
1. One waste basket shall be located in restroom.

2.03 NOT USED

2.04 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

3.02 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

SECTION 112600

UNIT KITCHENS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract.

1.02 SUMMARY

A. Section includes factory-fabricated and assembled unit kitchen including appliances.

1.03 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, finishes, furnished specialties, and accessories. Include rated capacities, operating characteristics, and utility requirements of appliances.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Finish for cabinets and unit kitchens, 8 by 10 inches (200 by 250 mm).
2. One full-size unit of each type of exposed hardware.

1.04 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of unit kitchen from manufacturer.

B. Manufacturer Certificate: Signed by manufacturer certifying that units comply with requirements.

C. Warranty: Sample of special warranty.

1.05 CLOSEOUT SUBMITTALS

A. Maintenance Data: For unit kitchen appliances to include in maintenance manuals.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that fabricates unit kitchens and their components.

B. Source Limitations: Obtain unit kitchens from single source from single manufacturer.

C. Regulatory Requirements: Where unit kitchens are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1 .

D. 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.

E. Appliance Standards:

1. Refrigerators and Freezers: UL 250 or AHAM ER-1.
2. Microwave Ovens: UL 923.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-assembled units, individually factory packaged and protected. Label with manufacturer's name, product name, and model number.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install unit kitchens until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Field Measurements: Verify actual dimensions of construction contiguous with unit kitchens by field measurements before fabrication.

1.09 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that unit kitchens can be supported and installed as indicated.

B. Coordinate wiring requirements and current characteristics of unit kitchens with building electrical system.

C. Coordinate layout and installation of plumbing, mechanical, and electrical services for unit kitchens.

D. Coordinate fittings and connections with Section 224100 Plumbing Fixtures and Item 599.0618NNWE Control House Plumbing.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace hermetically sealed refrigerator compressor system of unit kitchens that fail within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Dwyer Products
2. Summit Appliances
3. Or approved equal.

2.02 UNIT KITCHENETTE

A. Basis of Design: Dwyer Products: KC-23047 Kitchen – No cooktop, or approved equal.

B. Unit Kitchenette: All-in-one kitchenette includes stainless steel countertops, SS integral sink, Gooseneck faucets, refrigerator/freezer, microwave, end and back wall shield, and overhead cabinetry.
1. Dimensions: 84" height, 45" width, 26" depth
2. Faucet Finish: Chrome.
3. Refrigerator Type: 5.1 C.F. Refrigerator/Freezer
   a. Electrical Supply for Refrigerator: 120V AC/60HZ, 1.3 Amps. Plug in requiring a grounded recessed receptacle on a 15 amp circuit.
4. Microwave Type: 1.5 C.F.
5. Microwave Size: 30"
   a. Electrical Supply for Microwave: 120V AC/60HZ, 14 Amps, 160 KW, Output: 950 Watts, Input: 1580 Watts. Plug in appliance brought to a separate 15-20 amp single-grounded outlet.

C. Refer to Section 224100 for water supply and waste fittings.

2.03 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.04 FINISHES

A. Stainless-Steel Finishes: Remove tool and die marks and stretch lines, or blend into finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine walls and floors, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Examine walls and partitions for proper backing for unit kitchens.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Comply with requirements for connecting unit kitchens and appliances to electrical power system.

3.03 ADJUSTING AND CLEANING

A. Test, adjust, and verify operation of each appliance, plumbing fixture, and component of unit kitchens. Repair or replace items found to be defective or operating below rated capacity.

B. Verify that operating parts work freely and fit neatly and that clearances are adequate to properly and freely operate appliances.

C. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

D. After completing unit kitchen installation, remove protective coverings if any.

E. Repair or replace damaged parts, dents, buckles, abrasions, and other defects affecting appearance or serviceability. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 224100

PLUMBING FIXTURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Provisions Specification Sections, apply to this Section.

B. Plumbing Code of New York State applies to this section.

C. Item 599.0618NNWE Control House Plumbing.

1.02 SUMMARY

A. Section Includes:
   1. Lavatories.
   2. Faucets
   3. Water closets.

1.03 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for lavatories.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: Include diagrams for power, signal, and control wiring.

1.04 INFORMATIONAL SUBMITTALS

A. Manufacturer's Warranty

1.05 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For plumbing fixtures and faucets to include in operation and maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Faucet Washers and O-Rings: Equal to 1 of each type and size installed.
   2. Faucet Cartridges and O-Rings: Equal to 1 of each type and size installed.
   3. Toilet Seats: Equal to 1 of each type installed.

1.07 WARRANTY

A. Provide Manufacturer's standard warranty and agree to repair or replace components that fail in materials or workmanship within specified warranty period.

PART 2 - PRODUCTS

2.01 LAVATORIES

A. Lavatory:
   1. Enameled Cast Iron Wall-Mount Lavatory:
      a. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard Regalyn Wall-Mount Lavatory or comparable product by one of the following Manufacturers subject to compliance with requirements:
         1) American Standard America
         2) Eljer, Inc.
         3) Kohler Co.
         4) TOTO USA, INC.
         5) Or approved equal.
      b. Standard: ASME A112.19.2/CSA B45.1 for vitreous-china lavatories.
      c. Rectangular Nominal Size 20 by 18 inches (508 by 457 mm).
      d. Faucet-Hole Punching: Faucest holes on 4" centers.
      e. Color: White.
   2. Faucet: Comply with the requirements in "Lavatory Faucets" Article.
   3. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
   4. Waste Fittings: Comply with requirements in "Waste Fittings" Article.

2.02 LAVATORY FAUCETS

A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet materials that will be in contact with potable water.

B. Lavatory Faucets : Two-handle mixing valve.
   1. General-Duty, Copper- or Brass-Underbody Faucets:
      a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      b. Basis-of-Design Product: Subject to compliance with requirements, provide American Standard Monterrey 7500 or comparable product by one of the following:
         1) American Standard America.
         2) Delta Faucet Company.
         3) Eljer, Inc.
         4) Moen Incorporated.
         5) Or approved equal.
   2. Standard: ASME A112.18.1/CSA B125.1.
   3. General: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes; coordinate outlet with spout and fixture receptor.
   4. Body Material: General-duty, copper or brass underbody with brass cover plate.
   5. Finish: Polished chrome plate.
   6. Maximum Flow Rate: 1.5 gpm (5.7 L/min.).

7. Centers: 4 inches
8. Mounting: Deck, exposed.
9. Valve Handle(s): Wrist blade, 6 inches
10. Inlet(s): NPS 3/8 (DN 10) tubing
11. Spout: Rigid/Swivel, gooseneck.
12. Spout Outlet: Aerator
13. Drain: Grid.

2.03 WATER CLOSETS

A. Water Closets : Two piece round toilet system, vitreous china.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: Subject to compliance with requirements, provide Saniflush 083 Two-Piece Round Toilet System with 005 Toilet Tank or comparable product by one of the following:
   a. Saniflo SFA
   b. American Standard America.
   c. Eljer, Inc.
   d. Kohler Co.
   e. TOTO USA, INC.
   f. Zurn Industries, LLC; Commercial Brass and Fixtures.
   g. Or approved equal.
3. Bowl:
   a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
   b. Material: Vitreous china.
   c. Type: Close-Couple Toilet
   d. Height: 16 ¾" (without seat).
   e. Rim Contour: Elongated.
   f. Water Consumption: 1.28 gal. (4.8 L)
   g. Water spot: 4 ½" x 3 ¾"
4. Tank:
   a. Material: Vitreous china.
5. Toilet Seat: Includes soft-close toilet set with mounting hardware
6. Supply Fittings:
   a. Standard: ASME A112.18.1/CSA B125.1.
   b. Supply Piping: Chrome-plated-brass pipe or chrome-plated-copper tube matching water-supply piping size. Include chrome-plated wall flange.
   c. Stop: Chrome-plated-brass, one-quarter-turn, ball-type or compression stop with inlet connection matching water-supply piping type and size.

2.04 SUPPLY FITTINGS

A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet materials that will be in contact with potable water.

B. Standard: ASME A112.18.1/CSA B125.1.

C. Kitchenette Faucet and Lavatory Supply Fittings:

1. Supply Piping: Chrome-plated-brass pipe or chrome-plated-copper tube matching water-supply piping size. Include chrome-plated wall flange.
2. Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression stop with inlet connection matching water-supply piping type and size.
   a. Operation: Wheel handle.
3. Risers:
   a. Size: NPS 3/8 (DN 10) for lavatories.
   b. Material: Chrome-plated, soft-copper flexible tube riser.

2.05 WASTE FITTINGS

A. Standard: ASME A112.18.2/CSA B125.2.

B. Drain: Grid type with NPS 1-1/4 (DN 32) offset tailpiece for accessible lavatories.

C. Trap:
1. Size: NPS 1-1/4 (DN 32).
2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-(0.83-mm-) thick brass tube to wall; and chrome-plated-brass or -steel wall flange.

2.06 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

B. Characteristics: Nonshrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine roughing-in of water-supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before plumbing-fixture installation.

B. Examine walls, floors, cabinets, and counters for suitable conditions where fixtures will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install plumbing fixtures level and plumb according to roughing-in drawings.

B. Install floor-mounted water closets on closet flange attachments to drainage piping.

C. Install counter-mounting fixtures in and attached to casework.

D. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
   1. Exception: Use ball, gate, or globe valves if supply stops are not specified with fixture.

E. Install toilet seats on water closets.

F. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

G. Install traps on fixture outlets.
   1. Exception: Omit trap on fixtures with integral traps.

H. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings

I. Seal joints between plumbing fixtures, counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.

3.03 CONNECTIONS

A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

3.04 ADJUSTING

A. Operate and adjust plumbing fixtures and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Adjust water pressure at faucets to produce proper flow.

3.05 CLEANING AND PROTECTION

A. After completing installation of plumbing fixtures, inspect and repair damaged finishes.

B. Clean plumbing fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

C. Provide protective covering for installed plumbing fixtures and fittings.

D. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION

ITEM 599.061201WE REHABILITATE SPAN DRIVE MACHINERY

ITEM 599.061202WE REFURBISH TRUNNIONS

ITEM 599.061203WE MACHINERY FIELD PAINTING

ITEM 599.061204WE SERVICE REDUCERS

ITEM 599.061205WE REPLACE SPAN LOCKS AND MISCELLANEOUS REPAIRS

1.0 DESCRIPTION

1.1. **Notice of Beginning of Work.** The provisions of §564-1, Structural Steel standard specification for NYSDOT shall apply and is supplemented herein. The Contractor shall give the WCDPW ample notice of the beginning of work at the fabrication area, so that a Department Representative may be on hand for inspection. No material shall be manufactured, or work performed before the WCDPW has been so notified.

1.2. **Description of Machinery Work.** Under these items the Contractor shall remove existing machinery items; shall furnish, refurbish, install, align, lubricate, field painting, and place in operating condition the span drive machinery, trunnion machinery, and span lock machinery and miscellaneous work as detailed on the Contract Plans and as specified in these Special Specifications. The Contractor shall be responsible for the coordination of the mechanical work with all other work items as necessary to produce completed a system which meets the requirements of the Contract Documents. This item includes all the Work related to the machinery including operation and maintenance manuals.

A. Pay Item 599.061201WE Rehabilitate Span Drive Machinery: This work encompasses all field work to the span operating machinery including removing and disposing, shipping, delivery, installation, alignment, measuring and testing. It also includes all submittals of shop drawings and other documents, fabrication and procurement of all materials associated with the span drive machinery.

B. Pay Item 599.061202WE Refurbish Trunnions: This work encompasses all submittals, materials, fabrication, field work, including: removing and disposing, shipping, installation, alignment, measuring and testing associated with the trunnion assemblies, bearings and its supports and interface with structure.

C. Pay Item 599.061203WE Machinery Field Painting: This work encompasses all submittals, materials, and field work, including: removing and disposing, shipping, protecting, covering, sealing, cleaning and painting, associated with painting the machinery and interfacing surfaces.

D. Pay Item 599. 061204WE Service Reducers: This work encompasses all submittals, materials, procurement of parts, inspection and testing done offsite associated with servicing and refurbishing the existing gear reducers.

E. Pay Item 599.061205WE Replace Span Locks and Miscellaneous Repairs: This work encompasses all field work to the span lock machinery including removing and disposing, shipping, delivery, installation, alignment, measuring and testing. It also includes all submittals of shop drawings and other documents, fabrication and procurement of all materials associated with the span lock machinery.

1.3. **Governing Standard.** The governing standard for all mechanical work shall be the

AASHTO LRFD Movable Highway Bridge Design Specifications, 2007 and all interim revisions, and the AASHTO Standard Specifications for Movable Highway Bridges.

1.4. **Standards.** Standards referred to in these Special Specifications and on the Contract Plans are published by the following organizations and are directly applicable to the material and workmanship required for this work.

1. AASHTO - American Association of State Highway and Transportation Officials
2. AGMA - American Gear Manufacturers Association
3. ANSI - American National Standards Institute
4. ASME American Society of Mechanical Engineers
5. ASTM - American Society for Testing and Materials
6. AWS - American Welding Society
7. NEMA - National Electrical Manufacturers Association
8. NYSSCM New York State Steel Construction Manual
9. SAE - Society of Automotive Engineers
10. SSPC Society for Protective Coatings

2.0 MATERIALS

2.1. **General Materials and Workmanship**. All materials for machinery parts shall be new unless otherwise indicated and shall meet the minimum requirements of the standards indicated on the Contract Plans and as specified herein. All materials shall be supplied by approved manufacturers as defined herein.

2.2. **Substitutions**. Items specified by manufacturer name or part number on the Contract Plans may be replaced by an equivalent item by another manufacturer, subject to approval by the Engineer that satisfy all listed requirements. All changes required by the substitution shall be made by the Contractor in writing at no additional cost to the Department. Item equivalency shall be determined at the sole discretion of the Engineer and may be based on one or more of the following: quality, function, ease of maintenance, physical size, reliability, value, load capacity (static and dynamic), durability, availability and other criteria as deemed appropriate by the Engineer.

A. The terms "approved equal", "of equal quality" and "or equal" which may appear on the Plans and in these Specifications are intended to allow the Contractor to submit for review other manufacturers and model numbers of products of equal quality and rating for those specified.

B. Acceptance by the Department of any substitute products submitted by the Contractor shall not relieve the Contractor of responsibility for the proper operation, performance, or functioning of that product.

C. Where a product is specified by a manufacturer's name and catalog or part number in this Specification or on the Plans, it is so specified to establish quality, configuration, and arrangement of parts. An equivalent product made by another manufacturer may be submitted for review for the specified product subject to the acceptance of the Department; however, all necessary changes required by the substitution in related machinery, structural, architectural and electrical parts, shall be made by the Contractor at no additional cost.

D. Any part is modified in any manner from the way it is described or delivered by its original manufacturer, the contractor shall deliver a drawing which details each modification, and the part shall be assigned a unique part number to assure procurement of proper spare/replacement parts.

2.3. **Bronze Bearing Bushings**. Material for bronze bushings shall be as indicated on the Contract Plans and shall meet the requirements for Castings. Bronze bushings shall be provided with grease grooves as indicated on the Contract Plans. The grease grooves shall have smooth edges that blend smoothly in the bearing surface. The corners of all grooves will be rounded to a radius equal to half the width of the groove or as shown, with all radii tangent to adjoining surfaces. The entry hole from the grease fitting must intersect and lie completely within the grooves. All grease grooves shall be machine cut. Hand cutting of grease grooves is not acceptable. Use of "Double Oval" grooving is required, unless otherwise shown on plans. Where flat head cap screws are specified to secure bushings to their housings, the cap screws shall be manufactured from brass. Brass liners having a total thickness of 1/4-inch consisting of one solid piece 1/8-inch thick and one laminated piece 1/8-inch thick with 0.003-inch laminations shall provide the proper fit between the bearing and shaft or trunnion.

A. Self-lubricated oil impregnated bushings shall be made from ASTM B438 grade 1, type 4.

2.4. **Rolling Element Bearings**. Rolling element bearings shall meet ABMA standards. The fit and surface finish of the shaft at the bearing locations shall be in accordance with the bearing manufacturer's recommendations. The Contractor shall submit certification of the recommended fits and surface finishes at the bearing locations. Bearing data shall be provided on a brass or stainless-steel nameplate mounted on the housing.

A. Unless otherwise indicated on the Contract Plans, perform visual surface examinations of steel castings per ASTM A802, liquid-penetrant exams in accordance with ASTM E165, or magnetic particle exams in accordance with ASTM E709 in the manufacturer's shop, for each casting. Identify and remove unacceptable surface discontinuities in accordance with ASTM A802. Obtain approval from the Engineer before making any necessary major weld repairs (as defined in ASTM A781 S16 Weld Repair Charts). Any aberrant indications must be brought to the Engineer's attention for review and may result in rejection of the weld repair.

B. For spherical roller bearings the rollers shall be separated and held in alignment to its race with a machined brass cage, one-piece, land riding, with open-end fingers holding each roller.

C. Bearing and bearing housing materials shall be determined by the bearing manufacturer in accordance with applicable specifications and the design loads shown in the Plans. Unless otherwise shown in the Plans, anti-friction bearings shall be selected for L-10 life of 40,000 hours for the configuration shown on the Plans.

D. Include in bearing submittals calculations verifying bearing capacity, L-10 life, cap bolt and bearing housing capacity, and recommended maintenance, installation, and lubrication procedures.

E. Seal bearing lubrication cavities with labyrinth type seals around shaft. Pillow blocks shall be from the same manufacturer as the roller bearing manufacturer.

2.5. **Couplings**. All couplings shall be oil tight under all operating conditions. Coupling halves shall be bored and provided with keyseats and keys. Coupling assemblies shall be dynamically balanced at their rated speed.

A. Grid and Gear Couplings

1. Grid Couplings. Grid-type couplings shall be self-aligning, flexible (in bending and torsion) for absorption of high-impact or vibration loads to reduce transmission of peak torque impact loads. Provide steel hubs, alloy steel grids, and steel covers. Provide shrouded cover bolts.

2. Gear Couplings. Couplings shall be gear type couplings with exposed bolts unless specified otherwise. Couplings shall be made of forged alloy steel, have curved face teeth, and provide for at least a 3/4-degree misalignment per gear mesh.

3. Provide new couplings complete assembly with new keys. bolts, seals, and gaskets. Coupling size is defined in the Plans

   a. Bore hubs for an ANSI FN2 fit with shafts.

   b. Provide new keys.

   c. Provide 1 spare seal and gasket kit, and complete set of spare coupling bolts for each coupling size.

B. Jaw Couplings

1. Provide jaw couplings with bronze spider insert for connecting span control equipment.

2. Coordinate coupling hub bore with electrical equipment. Match keyseat and bore for an ANSI LC3 fit. Provide a stainless-steel set screw into the top of the key.

C. Flexible couplings shall be as manufactured by one of the following companies, or approved equal:

1. Falk Corporation, Milwaukee, WI

2. Lovejoy, Inc., Downers Grove, IL

3. Kop-Flex / Regal, Florence, KY

2.6. **Fasteners.**

A. The material used for turned bolts shall meet the requirements of ASTM A193, Grade B7. Turned bolts shall be connected using nuts meeting the requirements of ASTM A194, Grade 2H. Turned bolts shall be fully detailed on Shop Drawings.

1. Turned bolts are called out by nominal thread diameter on the Contract Plans. The bodies of turned bolts shall be 63 microinch finish or finer as defined by AASHTO. Body diameter shall be 1/16-inch inch larger than thread diameter. Bolt heads shall be standard hex for bolts of the next nominal size larger than the thread diameter or heavy hex for nominal thread diameter. All turned bolts shall be provided with thread relief at the transition from thread to body. Unless otherwise noted, shanks shall be machined to provide an ANSI LC3 fit, after the parts are correctly assembled and aligned.

2. Where specified, order full body bolts with 1/64-inch oversized diameter, or for bolts greater than 1-3/8-inch diameter order 1/32-inch oversized diameter.

B. Machinery fit, high-strength bolts shall meet the requirements of ASTM F3125 grade A325 or A449 high strength type 1 bolts and shall have finished bodies and regular hexagonal heads. For bolts required in non-standard lengths SAE grade 5 is acceptable with submittal of material certification. Bolt bodies shall have a straightness tolerance of 0.002 inch. Polish

or machine the bolt diameter to achieve an overall body diameter deviation within the given shaft tolerance of an LC8 fit for the entire lot of finished body bolts. The finished body diameter shall be equal or greater than the thread major diameter after polishing or machining the bolt. All bolts of each size and type shall be from the same material lot and submit shank diameter measurement for a sample of ten bolts for verification of shank tolerance.

C. Double heavy hex nuts are required for turned bolts and any other bolts used to directly fasten machinery unless indicated otherwise in the Contract Plans. Where double heavy hex nuts cannot be used, jam and heavy hex nuts shall be used. Alternate locking methods shall be submitted to the Engineer for approval.

D. Machinery fit bolts and turned bolts shall be installed with a hardened plain washer meeting ASTM F436 under the nut and bolt head. Other bolts in non-fitted holes require a washer under just the nut.

E. High strength bolts shall be connected using nuts meeting the requirements of ASTM A563, Grade DH.

F. Brass, hex socket flat countersunk head cap screws shall be manufactured from ASTM F468 Cu651.All brass hex socket flat countersunk head cap screws shall be tightened to 50 percent of the screw's yield strength. Apply a thread locking compound to the threads of all screws that secure bronze bushings to plain bearings immediately prior to final tensioning. Brass screws shall be provided for securing bronze bearings, plates and wear strips. Brass to have a hardness of Rockwell B55 and tensile strength of 50 ksi.

G. The dimensions of socket-head cap screws, socket flathead cap screws and socket-set screws shall conform to ANSI Standard B18.3. The screws shall conform to ASTM F837 or F879 (Stainless Steel) for diameters less than 7/8-inch and ASTM A574 or F835 (Alloy Steel) for diameters equal or greater than 7/8-inch. Unless otherwise called for on the drawings or specified herein, set screws shall be of the headless safety type, shall have threads of coarse thread series and shall have cup points. Set screws shall neither be used to transmit torsion nor as the fastening or stop for any equipment that contributes to the stability or operation of the bridge.

H. Fasteners and anchors less than 1/2-inch diameter shall be stainless steel AISI type 316.

I. Anchors to meet either ASTM A193 Grade B7 threaded rod with ASTM A194 Grade 2H nuts or ASTM F1554 Grade 1055, unless noted otherwise. Secure anchors with manufactured high strength mixed epoxy with slow cure time, minimum bond strength of 1.6 ksi tested in accordance with ASTM C882 and minimum compressive strength of 12 ksi tested in accordance with ASTM D695.

J. Sleeve or wedge type anchors are permitted for anchors less than 1/2-inch and not loaded in tension. Torque-controlled, with impact section to prevent thread damage, exhibiting follow-up expansion under load, with provision for rotation prevention during installation.

K. Except for turned bolts, all bolts, screws, anchors, nuts, and washers shall be hot-dipped galvanized in accordance with ASTM A153 unless noted otherwise.

L. Split lock washers shall conform to ASME B18.21.1. The material shall meet the SAE tests for temper and toughness. Use stainless steel type 316 for fasteners less than 1/2-inch diameter and zinc plated steel for larger size fasteners.

M. All cotters shall conform to the SAE standard dimensions and shall be made of half-round

stainless-steel wire, ASTM A276, Type 316.

N. All fasteners shall be of United States manufacture and shall be clearly marked with the manufacturer's designation.

2.7. **Forgings.** Carbon Steel and Alloy Steel Forgings shall meet the requirements of ASTM A668 unless otherwise noted All forgings shall be subjected to ultrasonic examination in accordance with ASTM A388.

A. Forged rounds for shafts and pins shall be true, straight and free from all injurious flaws such as piping, laps, seams or cracks. Finished ends of shafts and pins shall have a 60-degree lathe center with clearance hole at the exact center of the shaft. Shafts with bored holes shall have the ends prepared for a device equivalent to the lathe centering device furnished as part of the work. Stepped shafts shall have fillets finished smoothly to adjacent surfaces without tool marks or scratches. Surface finish for fillets shall have a maximum roughness of 63 microinch according to ANSI Standard B46.1 unless a finer finish is required.

B. All forgings shall be reduced to size from a single bloom or ingot until the cross-sectional grain is homogeneous. The blooms or ingots shall have a cross-sectional area at least three times that required after finishing. No forging shall be done at less than a red heat.

C. Unless otherwise indicated, perform for each forging:

1. Magnetic Particle exams in accordance with ASTM A275 and ASTM E709 performed by fabricator after finish machining.

2. Ultrasonic exams in accordance with ASTM A388 performed by foundry.

3. Any indications (loss of back reflection) using the straight beam method, which cannot be readily explained by the geometry of the piece, will be cause for rejection. Any forgings which are rejected shall be replaced at no cost to the Department.

D. Rough machine gear and pinion forgings prior to final heat treatment.

E. Forgings that are welded for fabrication of the completed machinery part shall have carbon content limited in accordance with ASTM A668, Supplementary Requirement S4.

F. No tack welding on forged materials permitted for lugs to aid with handling materials.

G. Submit certified factory and material test reports for forgings unless otherwise noted.

2.8. **Gear Reducers**. Refurbishment of Operating Machinery Gear Reducers R1, R2, and R3

A. There are three existing operating machinery gear reducers. Units shall be refurbished including replacing hardware. Field verify hardware quantities listed herein. Furnish and install sufficient quantities of new parts indicated for a complete replacement.

1. R1: Prager/Rexnord Serial Number: 52124-1

2. R2: Prager/Rexnord Serial Number: 52124-2

3. R3: Prager/Rexnord Serial Number: 52124-3

B. Roller Bearings

1. New Input, Intermediate and Output Shaft Roller Bearings

a. Replace all shaft bearings with new bearings in-kind. Use standard manufactured

roller bearings as defined herein under Rolling Bearing Elements.

b. Polish shafts and bearing seats prior to fitting on new bearings.

2. Seal bearing lubrication cavities with new seals around shaft. Install new mechanical type dual lip spring loaded oil seals that compensate for wear.

C. Helical Gears

1. Clean gearing including all other surfaces to requirements of SSPC SP1.

2. After cleaning gears and pinions perform a magnetic particle examination of all surfaces especially the roots of teeth, rim and hub radii, and keyseats in accordance with ASTM E709. If any indications are found machine the affected area and perform ultrasonic testing in accordance with ASTM A388 to ensure no discontinuities remain.

3. Reassemble gear shafts with new roller bearings and check gear teeth alignment meets AGMA 6013-B16, Standard for Industrial Enclosed Gear Drive.

D. Gear Reducer Housing. After removing all components and hardware from the housing solvent clean to SSPC SP1 its interior and exterior. Protect all machined surfaces. Primer paint interior with an oil resistant paint approved for use in enclosed gear drives. Clean and paint the exterior using SSPC SP 1 and paint with 2-coat system. Provide new in-kind bolt assemblies for clamping the split housing together. Primer coat all mounting surfaces and housing split mating surfaces.

E. New Breather Filter and Pipe Nipple

1. Moisture trap and particle filter breather. The filter can be either reversible flow media or desiccant type. Moisture trap to always maintain a lower dew point inside the reducer than ambient air dewpoint even when shut down over night.

2. Particle filtration to be rated for 10 microns.

3. Include a galvanized steel pipe nipple with each filter. Match threads to existing elbow.

F. New Shaft Seals and Screws

1. Provide new shaft seals for each gear reducer input and output shafts. Seal shall be one-piece spring loaded fluoroelastomer seal with geometry matched to existing seal to be replaced.

2. New screws, size: in-kind cap screw. All new screws to be SAE Grade 5, zinc plated with zinc plated steel washer.

G. New Oil Level Sight Glass and Drain Valve

1. Brass gasketed break-proof window with stainless-steel reflector.

2. Match thread size to existing thread in housing. Full-port drain valve with brass square drive plug.

3. Buna-N seals.

4. Oil-Rite Corporation or approved equal.

H. New Inspection Port Gasket and Screws

1. New Gasket, Oil Resistant, Aramid/ Buna-N Blue, 1/32-inch Thick.

2. New Port Cover Screws: Screw size: in-kind cap screw. All new screws to be SAE Grade 5, zinc plated with zinc plated steel helical spring lock washer.

I. New Mounting Turned Bolts

1. Provide new in-kind turned bolts for mounting the gear reducer to its structural supports.

2. Turned bolts to meet requirements specified herein under Fasteners. Include galvanized nuts and flat galvanized washer per assembly.

J. Shop Testing Speed Reducers

1. Shop test each reducer by running it at the normal operating speed, no load, for two hours. Half of the run shall be one direction and the other half in the opposite direction. Immediately before the start of the test, and at 5-minute intervals thereafter, the following measurements shall be made and recorded and the records shall be submitted with the Certificate of Compliance:

   a. Temperature of ambient air.

   b. Temperature of oil near bottom of reservoir.

   c. Surface temperature of each shaft extension adjacent to shaft seal.

   d. Sound level at point above and 3 feet distant from center of unit.

2. The temperature of the oil shall not rise more than 30 degrees F from ambient during this test and no shaft shall experience a temperature rise of more than 30 degrees F from the ambient. The noise level of the reducer shall not exceed 90db with the microphone held 3 feet from the reducer housing.

3. During testing, each speed reducer shall be checked for unusual noise (thumping or any non-uniformity), and any other unusual operating characteristics. The units shall operate smoothly, and without excessive vibration or temperature rise. All malfunctions shall be recorded and corrected, and the units retested, if necessary, before release from the shop.

4. After successful completion of the test, perform the following and submit with Certificate of Compliance:

   a. Take an oil sample from each unit and test for wear particles. Acceptance criteria is not more than 10 ppm for each wear element.

   b. Measure input and output shaft runout. Full Indicator Movement (FIM) not more than 0.001-inch.

   c. Color, high resolution photographs of tooth contact patterns developed during assembly as required above under Assembly.

5. After the unit has passed the test, a Certified Test Report shall be submitted by the Contractor to the Department.

6. Do not run the test with the motor, couplings and keys that are to be provided as part of the Work. Do not ship the unit with the oil used during testing.

2.9. **Open Gearing.** Refurbishment

A. Clean open gearing including all other surfaces to requirements of SSPC SP1.Protect all

machined surfaces and blast clean to requirements of SSPC SP6.

B. After cleaning gears and pinions perform a magnetic particle examination of all surfaces especially the roots of teeth, rim and hub radii, and keyseats in accordance with ASTM E709. If any indications are found machine the affected area and perform ultrasonic testing in accordance with ASTM A388 to ensure no discontinuities remain.

C. Machine gear hubs and pinions for an FN2 fit with its new shaft. Remove at least 1/32-inch of steel from its I.D. Polish keyseats and provide new keys to requirements defined herein.

D. Primer and paint all surfaces except the teeth and bore to requirements defined herein.

2.10. **Shafts and Pins.** Rolled shafts shall meet the requirements of ASTM A675, grade 75. Shafts shall be accurately finished, round, smooth and straight. Straightness tolerances shall be 0.002 inches per foot for shafts up to and including 1-1/2 inches in diameter and 0.003 inches per foot for shafts over 1-1/2 inches in diameter. Forged shafts and pins shall meet the requirements for forgings. Stepped shafts shall have rounded fillets finished smoothly to adjacent surfaces without tool marks or scratches. Surface finish for fillets shall have a maximum roughness of 63 microinches according to ANSI B46.1, unless otherwise noted on contract plans. Each shaft or pin with a uniform diameter of 8 inches or more shall be bored lengthwise through the center to a diameter approximately one fifth the smallest diameter. Shafts and pins exhibiting defects will not be accepted. Shafts that are bored with an inspection hole shall have the ends prepared for the attachment of a centering device equivalent to the lathe center. All such devices shall be furnished as part of the work. All shafts shall be free from camber and shall run without noise, vibration, or chatter at all speeds up to and including at all operating speeds. Bearing areas of shafts shall be free of tool marks or scratches and meet the finish and fit requirements listed in AASHTO 6.7.8. Fit of rolling element bearing I.D. and shaft shall be as specified by the bearing manufacturer.

A. All shafts and pins shall be accurately finished, round, smooth, and straight and, when turned to different diameters, shall have rounded fillets at the shoulders. Chamfer the ends of shafts and pins 1/16-inch.

B. All shafts and pins shall conform to tolerances in ASTM A29 unless otherwise indicated.

C. Each end of all shafts, when finished to the required lengths, shall have a 60-degree lathe center, with clearance hole, at the exact center of the shaft.

D. All pins shall be ASTM A668 class K forging unless otherwise shown on the Plans.

E. All hubs mounted on the ends of shafts shall have the fit specified herein or on the drawings. To obtain the required fit between hub and shaft, the Contractor shall furnish the shaft 1/16 inch larger than the nominal diameter specified and shall turn the ends to the required dimension for the hub.

F. Turned, ground, and polished shafts of the material and grade specified shall be used where shown on the drawings.

G. All journal-bearing areas on shafts and pins shall be accurately machined and polished, with no trace of tool marks or scratches on the journal surface or adjoining shoulder fillets. Burnishing of the shaft journal areas and adjoining shoulder fillets will be acceptable in lieu of polishing provided that the burnishing is done with a Stellite roller or equal, finished to a mirror surface. The surface finish of shaft journals shall be as shown on the drawings. Journal diameters shall be finished to the limits of an ANSI Class RC6 running fit.

H. After field installation of shafts supported in bearing the circular run-out tolerance shall be measured and recorded. Run-out requirements:

1. Shafts: 0.005-inch FIM (Full Indicator Movement)
2. Pins: 0.002-inch FIM
3. At any measuring position when the part is rotated 360 degrees about the datum axis with the indicator fixed in a position normal to the true geometric shape.

2.11. **Brakes:** Each brake shall be a spring set, thrustor released, drum-type, brake and shall be provided with corrosion resisting fittings hardware and pins.

A. Brakes shall have sintered metallic brake linings and include corrosion resistant hardware and other options specified herein.

B. Each brake shall be set to exert an actual retarding torque as specified in the Plans. Torque settings shall be factory set and tested for each brake. A torque scale in pound-feet shall be fixed to the spring case and calibrated from minimum brake torque setting to maximum torque setting with at least 10 major and minor graduations in between. Scale shall be weatherproof acrylic plate with permanent engraved markings.

C. The brake manufacturer shall furnish the brake wheel with the brakes. Wheels shall be ASTM A29 steel and dynamically balanced. The bores shall be left undersize and shipped to the machinery manufacturer who shall finish bore and mill keyseat to onto the designated shafts. The bore shall be concentric and perpendicular to the wheel surface to within a perpendicular tolerance of +/-0.002 inch.

D. Each brake shall be furnished with a thrustor motor with hydraulic time delay adjustments. The brake motor shall be rated for continuous duty or provided with a release valve that allows the motor to turn off while keeping the brake in the released position.

E. Each brake shall have three limit switches with one for set, release, and hand release. Each limit switch shall be as specified under "Limit Switches".

F. The down stroke time delays of the thrustors shall be set in such a manner that the brakes will not be applied simultaneously should electric power fail while the span is in motion.

G. The oil used in the thrustor operating chambers of the brakes shall be supplied by the manufacturer and be of a grade as recommended by the manufacturer. It shall have a free operating temperature range between -13° F and 122°F.

H. The thrustors shall be actuated by 480 volt, three phase, 60 Hertz, totally enclosed, squirrel cage motors controlled by magnetic contactors with manual reset thermal overload relays. The rated stalled thrust of each thrustor shall be not less than 135 percent of the thrust required to release the brake with the torque adjusted to the continuous rated value.

2.12. **Auxiliary Drive**

A. Provide roller chain and sprockets in accordance with ANSI B29.1 specification.

1. Link shall be shot peened, and its apertures shall undergo precision piercing, shaving and ballizing. Pins and rollers shall be case hardened and precision ground. Bushings shall have a polished surface finish. Chain pitch tolerance shall be precisely controlled and matched to its sprockets.
2. Sprockets shall be flame-hardened steel with a minimum hardness of 35 Rockwell 'C".

3. Mount driver sprocket with a hub that clamps the sprocket against friction discs with adjustable splined collar and springs. Recommend Martin Torque-Limiter Clutch size TT70 with two springs or Engineer approved equal.

   a. Polish the sides of sprocket that bears against clutch friction discs to better than a 63 micro-inch surface finish. Bore the sprocket for an RC 5 fit with bronze bushing and polish the bore to 16 micro-inch finish.

   b. Sprocket bushing shall be oil impregnated tin bronze alloy in accordance with ASTM B438, grade 1 bronze and type 2 wet density of 0.24 lb/cubic-inch. Bore the bushing to an LC3 Fit with the clutch hub. Polish the bushing outside diameter to 32 micro-inch finish.

   c. Fit the clutch hub onto the gearmotor shaft with a square key and an LT4 fit between the hub bore and output shaft.

B. Chain drive cover is split horizontally made from stainless steel AISI type 304, 16 gage thickness.

1. The bottom half of the cover shall be sealed to hold chain oil without any leaks. Provide a cut gasket adhered to backer plate at overlap with top cover. Adhere a gasket to each end flange. Top and bottom covers to be held with stainless steel type 316 thumb screws and similar bolts at each end flange.

   a. Shaft seals shall be either p bulb or lip type neoprene for use with oil.

   b. Gasket: Oil Resistant, Aramid/ Buna-N Blue, 1/32" Thick

   c. Dressing: Permatex Ultra Rubber Gasket Sealant or approved equal.

   d. Gasket Adhesive to be suitable for bonding specified materials of gasket and cover.

2. Provide safety placards on each side of the cover top half. Placards to be fabricated from white polyethylene plastic permanently printed with bold red text in capital letters. Letter height shall be 3/8-inch. Finish shall be oil resistant high gloss. Secure to the cover with (4) stainless steel rivets.

   a. "CAUTION – HIGH SPEED SPROCKET. COVER TO REMAIN IN PLACE DURING OPERATION"

   b. "NORMAL DRIVE OPERATION: CHAIN MUST NOT BE ON THE LARGE SPROCKET"

2.13. Linear Screw Actuator: The linear actuator shall be an Acme screw type, self-locking, manual hand wheel with mechanical disengage and electrical interlock, stroke as shown in the Plans plus at least 2 inches reserve stroke and linear speed of at least 1.5 inches/ second, and push/pull minimum thrust force of 4,600 lbs. A minimum 1-inch hardened forged alloy steel pin connects the lock bar to the actuator.

A. Include the following options:

1. Motor heater

2. Control switches to be adjustable proximity switches and integrated into the leaf controls circuits with interlocks. Refer to Electrical Plans and Division 16. Interlocking indication shall be triggered directly by the lock bar indicating lock "pulled" and "driven".

3. Internal end of travel urethane bumpers

4. Expandable boot rod cover

B. Manufacturer:

1. Nook Industries Inc., Cleveland, OH

a. Design Basis: Nook ILA-100 HL coupled with a Lovejoy size LS095 coupling to an SEW Eurodrive F37 gear reducer 23.6:1 ratio.

2. Raco International, Bethel Park, PA

3. Duff-Norton, Charlotte, NC

C. Spare Parts and Lubrication

1. General spare parts and lubrication requirements are called for under, Machinery in General.

2. (2) Lovejoy Jaw-in-Shear 6-pin urethane element and 6-pin ring assembly.

3. (1) Span lock rear guide bushing supplied by actuator manufacturer.

4. (1) span lock receiver shoe with shim pack.

5. (25) lbs. Linear Screw Actuator Grease

2.14. **Span Lock Cover.** Aluminum for the cover shall be meet ASTM B209, UNS Alloy A96160. Use neoprene of durometer Shore A 50 pads to separate aluminum from steel.

2.15. **Keys and Keyways.** Keys shall be effectively held in place by closed end keyways milled into the shaft. Ends of keys and keyways shall be rounded to a half circle with a diameter equal to the width of the key. Where more than one key is required, keys shall be located 120 degrees apart. Keys shall not extend into any bearing. Custom keys shall be provided as necessary for manufactured components to meet the required key fits and finishes. Set screws shall not be substituted for keys for transmitting torsion; they may be used only for holding keys or light parts in place. They shall be safety type headless set screws with cup points set in counterbored seats. Unless otherwise noted, they shall be secured in place by use of self-locking threads or thread locker coating.

A. Keys and keyways or keyseats shall conform to the dimensions and tolerances for square and flat keys of ANSI Standard B17.1, Keys and keyseats, unless otherwise specified. Fit of keys in their keyseats shall meet class 2 fit unless otherwise specified.

B. Keys in open end keyseats for high speed couplings shall be held with a set screw against the top of the key.

C. Unless otherwise specified herein or in the drawings, keys shall be machined from carbon steel forgings, ASTM A668, Class K. Keys 1-inch square and less can be ASTM A311, Class A, Grade 1045 cold drawn steel.

2.16. **Hubs and Collars.**

A. Hubs and collars shall be finished and polished to 16 micro-inch rms where the hub face prevents axial movement. Hubs shall be bored concentric with the pitch-circle of gears or the hub's outside diameter. All hubs shall have an ANSI Class FN2 medium drive fit on the shafts, unless otherwise specified. Machine keyways into hubs as defined herein.

1. Clamp type collars shall be heavy-duty two-piece collars made from black oxide steel and clamped with high-strength forged alloy steel screws.

2.17. **Shims.** Shims required for leveling and alignment of machinery and equipment shall be stainless steel neatly trimmed to the dimensions of the assembled part and drilled for all bolts that pass through the shims. Shims shall be shown in detail on the shop drawings. Shim packs shall be individually packaged to prevent damage from handling during shipment to the project site.

A. In general, sufficient thicknesses shall be furnished to secure 1/64-inch variations of the shim allowance plus one shim equal to the full allowance. For motors, thickness shall allow for 0.002-inch variations. Shims with open side or U-shaped holes for bolts will not be permitted. No shims shall have less than two holes for bolts. Oversized holes in shims are permitted up to 1/8-inch larger than the fastener diameter. Plastic or other non-metallic shims will not be permitted. The laminations shall be peel-able, 0.002-inch thickness.

B. Shims shall be Stainless Steel Type 316. Shims less than 1/32-inch to meet ASTM A666, and shims greater than 1/32-inch to meet either ASTM A240 or A276..

C. Shims length for motor feet shall be across the motor perpendicular to its shaft.

D. The Contractor shall make every effort to use full size shims and achieve full contact between the shims and the mating components to achieve the specified alignment requirements. In some cases, full contact between the shims and the mating components and achieving the alignment requirements may be mutually exclusive. In these cases, the use of partial or custom machined tapered shims may be required to achieve the alignment requirements. Partial shims shall only be used when the gaps produced between mating parts using partial shims is less than 1/64-inch. At least one (1) bolt shall pass through any partial shim that is used. In cases where partial shims would produce a gap greater than or equal to 1/64-inch, a custom machined tapered shim shall be used. Tapered shim plates shall have a minimum thickness of 1/4-inch after final machining. Tapered shims shall have a multidirectional lay top and bottom and shall have all surfaces machine finished to 250 micro inches. Tapered shim bolt holes shall be drilled and reamed in the field, after final alignment, to the same fit as the connected components. The cost of any partial or custom shims including materials, manufacturing, engineering, shipping, field measurements, etc. is considered incidental to the work and no additional compensation will be made for providing partial or custom shims. Any gaps that exist between shims and mating surfaces shall be sealed with silicone caulk to prevent moisture infiltration prior to painting.

2.18. **Lubrication Fittings and Piping.**

A. Size of grease lubricating fittings shall be standardized and shall be of the giant button head type, except as noted on the Contract Plans or unless the location of the fitting requires the use of a fitting that is smaller than the giant button head fitting. Under no circumstance shall the use of more than 2 different types of grease fittings be permitted. Fittings shall have a minimum rating of 3,000 psi and shall be equipped with a steel check valve that will receive grease and close against backpressure. Fittings shall be corrosion resistant suitable for marine environment.

1. Fittings shall be manufactured by Alemite or approved equal.

B. Fittings shall be in a protected and conveniently accessible position for use and shall be connected to the points requiring lubrication by pipe extensions where necessary. All piping

necessary to provide access for lubrication shall be clearly indicated on the shop drawings and all pipe components listed in the bill of materials. Pipe material shall be stainless steel meeting ASTM A312 Type 304 or 316 and shall conform to the following:

C. Pipe nipples shall meet the requirements of ASTM A733.

D. Pipe fittings shall meet the requirements of ASTM A182.

E. Brass pipe where specified shall meet the requirements of ASTM B43.

2.19. **Lubrication.** All lubricants shall be from manufacturers approved by the Department. The Contractor shall lubricate all rotating and sliding parts of the machinery with lubricant as indicated on the approved charts until final acceptance of the completed bridge. The surfaces of components that will rotate or slide relative to one another once assembled shall be lubricated prior to assembly. All clearance fits involving mating steel components shall be installed with a marine duty anti-seize compound prior to assembly. The following information applies to lubricants for the various machinery components:

A. Sleeve Bearings: The lubricant chosen shall be approved for use in sleeve bearings by the lubricant manufacturer. Recommended Lubricant: NLGI No. 2 grease with rust and oxidation inhibiting additives, water resistant, anti-wear/extreme pressure. 280 Worked Penetration at 77°F, 340°F (or higher) ASTM D2265 Drop Point, SUS 900 at 100°F, water resistant, anti-wear/extreme pressure.

B. Roller Bearings: The roller bearing lubricant, the maintenance of the lubricant, method of application, and re-lubrication intervals shall be recommended or approved by the roller bearing manufacturer unless specified otherwise in the plans.

C. Couplings: Coupling lubricant and its maintenance shall be specified by the coupling manufacturer. For high-speed motor couplings, the selected lubricant shall resist sling-off. For cross shaft and floating shaft couplings, the selected lubricant shall be appropriate for the speed of shaft rotation. Provide coupling lubricant NLGI EP 0 or EP 1 grease with rust and oxidation inhibiting additives, resists throw-off and dripping.

D. Open Gearing: The open gear lubricant utilized must bond strongly to gear teeth to maintain a continuous film on contact surfaces despite high loading and high load repetition, contain an EP-3 rating (Extreme Pressure) additive, repel water, resist throw-off and dripping, maintain consistency over wide temperature variations, and allow for ease in application and removal. The lubricant shall have an operating range of 0° F to 200° F and shall be considered heavy-bodied, adhesive-type open gear lubricant by its reputable lubricant manufacturer. The lubricant shall also meet the following minimum requirements: unleaded, non-dilutant type, non-chlorinated open gear grease, water resistant, anti-wear/extreme pressure.

E. Enclosed Gear Reducers: Meet the requirements of AGMA Standard 9005 "Lubrication of Industrial Gear Drives." Provide lubricants from a reputable manufacturer. The lubricant shall be extreme pressure rated with a viscosity index greater than 140, and contain oxidation inhibitors, rust inhibitors, anti-foaming agents, and anti-wear additives.

F. Proprietary units shall use lubricants specified and/or approved by the manufacturer.

G. The Contractor shall furnish the Department with copies of letters from the machinery and/or lubricant manufacturers endorsing the lubricants that have been selected. Lubricants shall be selected for year-round exposure at the bridge.

H. The Contractor shall furnish an additional supply for future maintenance use to include 25 lb. of each type of grease, a quantity of brake thrustor oil sufficient to replace the oil in each thrustor one (1) time, and sufficient oil to change out the oil in the reducer(s) one time. All lubricant shall be provided in the original manufacturer's sealed container to prevent contamination. Contractor shall protect all lubricants used during construction from contamination.

2.20. **Supports for Limit Switches:** Mount limit switches, magnets, and targets with ASTM A276 type 316 stainless steel. All hardware shall be type 316 stainless steel. Use dielectric washers and neoprene pads between stainless steel and carbon steel.

2.21. **Paints.** The paints shall be of one manufacturer and shall conform to the chemical and performance requirements of the manufacturer's published technical data application information, and the referenced specifications.

A. The paint coating system shall consist of one coat of aluminum epoxy mastic primer and one or two coats of aliphatic acrylic polyurethane.

1. 3-coat system to be used on machinery and structural steel areas which are cleaned to bare metal.
2. Use 2-coat system over existing paint.
3. Use one of the paint manufacturers listed on the NEPCOAT Qualified Products List A for shop painting or B for field painting and accepted by the Department.
4. Machinery parts paint color to meet requirements according to ANSI Z535.1. Use AMS-STD-595, safety orange color 12473 for parts that move and safety green color 14090 for stationary machinery parts adjacent to moving parts.
5. Machinery fixed to structural steel, machinery supports, and structural steel parts to match paint color of structural steel topcoat.

B. After coupling hubs are installed on all shafts in the shop, the remaining exposed portion of shaft shall be painted, with care to protect any adjacent bearing or seal. Bearing or sliding surfaces that are not to be painted will be coated with temporary protective materials.

2.22. **Coatings and Sealing**

A. Galvanized steel shall meet the requirements of ASTM A123 for zinc hot-dip galvanized coating shop applied.

B. Rust inhibiting coatings shall be used for the temporary protection of machined surfaces. Rush inhibitor shall be wax-type petroleum based Cosmoline meeting MIL-C-11796C Class C for use on machined metal surfaces.

C. The threads of all mounting bolts shall be coated with anti-seize compound before assembly with Bostik® Never-Seez, Marine Grade or approved equal.

D. For screw in tapped holes, pipe threads, and fittings use thread locker coating on threads for locking and sealing. Approved products:

1. Permatex® Threadlocker Blue or Red for permanent assembly
2. Loctite® Threadlocker Blue 242 or Red 271 for permanent assembly
3. Permatex® Seal + Lock Thread Compound for all pipe threads and fittings.

E. For sealing between interfaces of machined surfaces flanges such as for the center bearing oil box use Permatex® Anaerobic Flange Sealant.

F. For general sealing against water intrusion use Permatex® No. 2 sealant for oily surfaces. For sealing pipe threads use Permatex® Seal + Lock Thread Compound during assembly. For sealing inspection covers use Permatex® Ultra Rubber Gasket Sealant and Dressing or approved equal.

2.23. **Spare Parts.** The Contractor shall supply the following spare parts for the mechanical machinery:

A. Three (3) spare hygroscopic breathers, one for each speed reducer.

B. Two (2) sets of brake shoes, one for each span drive thrustor brake.

C. One (1) spare seal for each size of coupling.

D. One (1) spare span lock receiver socket shoe including (1) shim pack.

E. Two (2) spare span lock guide shoes including (2) shim packs.

F. Two (2) spare span lock shoe stud assemblies including nuts and washers.

G. One (1) spare emergency drive clutch hub assembly. Include an extra pair of clutch friction discs, and extra pair of clutch pressure plates.

H. Two (2) spare coupling spiders and rings for span lock gearmotor jaw coupling.

I. Two (2) spare grease fitting nipples for each size of grease fitting.

J. Turn over to the County all unused new lubricants for the machinery.

2.24. **Welding and Weldments.** The Contractor shall submit all weld procedures and qualifications for review and approval prior to the start of work. All welded machinery parts or supports shall be stress relieved by heat prior to machining. The Contractor shall include welding and stress relieving procedures with the shop drawings for parts that require welding prior to the start of work. The Contractor shall ensure that all weld procedures are appropriate for the materials identified in the Contract Plans.

A. Weldments are detailed in the Contract Documents to indicate finished dimensions. The Contractor shall take the necessary steps to account for material removal during machining to produce the indicated dimensions at the completion of all machining operations.

B. All welding shall be by certified welders. Welding for stainless steel shall conform to AWS D1.6 and welding for aluminum shall conform to AWS D1.2.

C. Machinery supports shall be fabricated from minimum 3/8-inch thick structural steel ASTM A709 Grade 50 unless otherwise noted.

D. Support weldments shall be welded with continuous welds and all joining edges sealed by welding. Use full penetration groove welds on both sides of web plates at joints to top and bottom mounting plates. Use a 5/16-inch minimum fillet weld size all around stiffener plates. Mill stiffener plates to bear at top and bottom. Clip corners of stiffeners to avoid overlap of welds or clear fillet welds.

E. Mill mounting plate surfaces after stress relieving. All mounting plate surfaces shall be parallel over entire length to within 0.002 inch.

F. Welding required for machinery shall be done in accordance with the Structural Welding Code AWS D1.1 and all interim revisions. All groove welds used to fabricate machinery shall be completely tested by ultrasonic inspection ASTM E164 per AWS D1.1, Section 6, Part F, and are subject to the acceptance criteria of Part C. Perform magnetic particle testing for all other welds used to fabricate machinery in accordance with ASTM E709.

G. Welding joint sizes and details shall be shown on Shop Drawings. Where multi-pass welds are required, welding procedures shall be submitted on or with Shop Drawings.

H. Distortion during fabrication shall be kept to a minimum by the use of welding fixtures and proper welding procedures. Base metals that are forged or heat treaded to increase hardness shall be preheated to prevent cracking prior to any welding. All machining shall be performed after welding and stress relieving.

I. Submit WPS and PQR for each weld type based upon tests which have been performed not more than 60 months in advance of production welding. Test base materials shall be equivalent materials as the production materials.

3.0 CONSTRUCTION DETAILS

3.1. General Requirements. All Work shall be subject to the requirements of Volume 1, Section 100 of the Standard Specifications.

A. No disassembly or removal of existing machinery, or installation and assembly of new mechanical components shall commence without approved demolition, installation and/or alignment procedures and supporting Assembly or Erection Drawings.

B. Any deviations from the work depicted on the Contract Plans or alterations proposed by the Contractor which affect the integrity or capacity of the machinery shall be detailed in drawing submittal(s) with accompanying calculations which shall be signed and sealed by a licensed Professional Engineer. Acceptance of the proposed deviations shall be at the discretion of the Engineer.

3.2. **Dimensional Verification.** Dimensions indicated on the Contract Plans are nominal and intended for information. The Contractor must coordinate the interface of the mechanical systems with the structure and verify all dimensions in the preparation of the shop, assembly and erection drawings.

3.3. **Certified Drawings.** The dimensions indicated on the Contract Plans for standard manufactured products have been obtained from information provided by various machinery manufacturers. The dimensions have not been obtained from certified drawings (certified drawings are drawings certified by the manufacturer to be dimensionally accurate). The Contractor shall submit certified drawings for all manufactured products for approval prior to purchase and utilize the certified dimensions in the preparation of the shop and erection drawings. The certified drawing shall be submitted in support of the shop drawings. The Contractor shall notify the Engineer of any dimensional deviations from the Contract Plans.

3.4. **Submittals.** Shop and assembly drawings, erection drawings, catalog cut and specification sheets, final record drawings, machinery removal and installation procedures, shop assembly procedures, test procedures and results, operating, maintenance and lubrication manuals, lubrication charts and other submittals specified herein are required as part of this work.

A. Submit for review the qualifications as defined herein under Quality Assurance:

1. Millwrights' qualifications and resume of previous projects.

2. Manufacturer's quality assurance program responsible for fabricating machinery, certification of the machinery manufacturer Quality Control Manager (QCM) and a resume of prior projects.

B. The Contractor shall provide a detailed submittal schedule to the Department within 30 days of the "Notice of Contract Award". The schedule shall address material submittals, shop drawing submittals, disassembly, demolition, assembly and installation procedure submittals, maintenance manual submittals, and any other required information.

C. Submit for review, prior to starting Shop Drawings:

1. Bridge site field measurements report and drawings to document existing dimensions and locations of all interface points between existing surfaces, and all indicated dimensions shown in the Plans. Indicate field verified dimensions that will be shown on Shop Drawings.

2. Measurements of existing span drive motor current.

3. Manufacturer's product data and/or Shop Drawings prepared and submitted for all manufactured and purchased items of machinery as defined herein.

4. Work Procedure: Detailed list of the work and test procedures to be followed.

5. Task Schedule: Schedule of work that requires interruption to movable span operation and restrictions to either roadway or channel navigation. Provide work activities for each day and the duration of the restriction.

6. Certified Test Reports: Include all chemical and mechanical properties for each material that is part of the Work.

7. Test Reports: All measurements after field adjusting and testing.

8. Manufacturers' warranties or guaranties for all equipment, and warranty by Contractor for installation and operation of all equipment. All warranties and guaranties shall be submitted in writing and assigned to the Department.

3.5. **Shop, Assembly and Erection Drawings.** Drawings, including shop, assembly, and erection drawings, shall be prepared to depict all work to be performed as part of this Contract. Shop and assembly drawings shall be submitted for all components that are custom built for this project. Drawings shall be given a suitable title to describe the parts detailed thereon. Each drawing shall be identified by the complete project name and number. Drawings which are reproductions of the Contact Drawings, either in part or in their entirety, shall be considered non-responsive and shall be returned without review.

1. Shop Drawings shall show assemblies and all parts. Assemblies are to include interface with the structure, electrical work, or other members, such as mounting to structural steel or coupling of a motor. Separate details shall be provided for all opposite hand components. Drawings shall be so complete that parts may be duplicated without reference to patterns, other drawings, or individual shop practice.

2. Drawing dimensions and tolerances shall be detailed in accordance with the latest version of ASME Y14.100, Engineering Drawing Practices. Reproduction of the Plans shall not be used as foundation sheets for Shop Drawings. Tolerances shall be provided for all drawing dimensions, either directly or via a standard tolerance block.

3. Drawings shall be completely detailed to scale and dimensioned in inches with decimal notation. For machined tolerance fits use four (4) decimal places. Avoid using fractions for machined surfaces.

4. All details of a given part shall be clearly visible at the scale selected for that part. Proprietary parts shall be shown in outline on the drawings with sufficient dimensions and data to determine the clearances required for installation and operation.

5. Required finish machining at mating parts shall be shown including grade of finish in accordance with ANSI B46.1, Surface Texture and dimensional tolerances, and allowances for specific fits in accordance with ANSI B4.1, Preferred Limits and Fits for Cylindrical Parts.

6. Show all appropriate weld symbols along with stress relieving process for weldments.

7. Complete shop bills of materials shall be included for all parts including quantity required. Materials and material specifications shall be stated for each part. Where ASTM or any other standard specifications are used, the applicable designation of such material specifications shall be given. Heat treatment, specific hardness, and/or mechanical properties requirements shall be identified when mandated. The weight of the detailed elements shall be included on the Shop Drawings.

B. Catalog cuts of manufactured purchased components are to include certified prints produced by the manufacturer based on the current data, sizes, dimensions, and features of the component to be purchased.

1. Certified dimension prints from equipment manufacturers shall state dimensions of all principal elements within the item, certified external dimensions and clearances affecting interfaces or installations, gross weight, pertinent ratings of the equipment. These prints shall indicate, when applicable, provisions for adding, draining, and checking the lubricant, method of lubrication, amount and type of lubricant required and type of fittings, the location of inspection openings and the location and type of venting devices. Complete assembly diagrams shall be provided for proprietary components that show each part contained within the item and its corresponding manufacturer's part number. The diagrams shall be sufficient to enable complete disassembly and re-assembly of the subject component and enable the definition and procurement of proper spare/replacement parts.

C. Complete assembly and erection drawings shall be furnished. These drawings shall be given identifying marks and essential dimensions for locating each part or assembled unit with respect to the bridge or equipment foundation. Every part shall be cross referenced to the sheet on which it is detailed. All proprietary items (e.g., enclosed gearboxes, brakes, etc.) shall be shown in outline on shop drawings.

1. All field-verified dimensions shall be clearly identified and distinguished from other dimension on the Drawings.

2. Include instructions for painting the machinery and identify all painted and unpainted surfaces with specified paint color.

3. The type of tightening, type of wrench and the value of torque or other pertinent information of all connection bolts for all items and machinery.

4. Complete details of all piping required to lubricate the machinery shall be provided.

Details shall include pipe size and material and any connections to the structure or machinery parts that may be required.

3.6. **Final Record Drawings ("As Built" Drawings).** Reproducible drawings of all materials as fabricated shall be submitted following fabrication. These shall be maintained on site by the Contractor and marked up with changes/revisions to reflect the as-installed condition. These working drawings shall be the basis for the deliverable As Built Drawings. Any deviations from the approved shop drawings shall be clearly indicated. These drawings shall be stamped "As Built", immediately above the title block and submitted with the maintenance manual.

3.7. **Machinery Removal/Installation Procedures.** The Contractor shall submit a detailed written removal and installation procedure for all machinery components. The procedure shall include sequence of removal and installation, protective packaging, rigging, routing of equipment out of and into the counterweight pit, alignment methods, alignment tolerances, bolt tightening methods and torque values for all bolts. Resumes for all supervising Engineers and millwrights associated with machinery installation and alignment shall be included with the written installation procedure.

A. The span will be inoperable during the offsite refurbishment of machinery; therefore, the span will need to be secured in the open position 84 degrees open. Secure the span against wind loads up to a 20 psf applied normal to the open span, and imbalance moment not to exceed 325 kip-feet. Use ballast to maintain span balance for structural work to the span.

B. The removal procedure shall include rigging drawings and calculations to lift and move the equipment out of the counterweight pit and over the pier wall to the navigation channel. Route crosses over the pit catwalk hung from the approach deck and through the bascule span cross bracing between FB6, bascule girders and the counterweight. Show and

C. The installation procedure must demonstrate to the Engineer that the Contractor has full knowledge of machinery connections and alignment procedures and that the work will be performed by qualified millwrights. Installation of the machinery shall not begin until a procedure and resumes have been submitted by the Contractor that are satisfactory in the sole opinion of the Engineer.

D. The Contractor shall correct and resubmit the procedures and/or submit resumes for alternate personnel as necessary to the satisfaction of the Engineer. This resubmission procedure, if required, shall not be considered cause for delay.

E. This item shall also encompass procedures for shop assembly of items which are to be shipped to the field as an assembled unit.

3.1. **Machinery Construction Details.** The Contractor shall supply all apparatus, tools, devices, materials and labor to manufacture, ship, install, erect, align, adjust, lubricate, test, and paint, the new span drive machinery. Any apparatus, tools, devices, materials and labor incidental to the work, but not specifically stated or included, which may be necessary for the work, shall be furnished by the Contractor at no additional cost to the Department. The Contractor shall coordinate and schedule work to suit requirements of the Department.

3.2. **Delivery, Storage, and Handling.** All machinery, materials, and items related to the mechanical work shall be properly protected for shipment and storage and shall meet the following minimum requirements.

A. All components and materials shall be delivered to the site in accordance with the

approved schedule of work. Any special provisions used for material handling shall be provided by the Contractor. No equipment shall be shipped to the field without being successfully tested and calibrated.

B. All finished metal surfaces and unpainted metal surfaces that would be damaged by corrosion, shall be coated with a 0.030-inch minimum film thickness, as soon as practical after finishing, of No-Ox-Id, Rust-Veto 344, Metal protective Oil L, or approved equal. This coating shall be removed from all surfaces prior to lubrication for operation and from all surfaces prior to painting after erection. If the anti-rust coating on any part becomes compromised prior to part installation, the coating shall be restored immediately.

C. All machinery shall be cleaned of dirt, chips, grit, and all other injurious material prior to shipping. Assembled units shall be mounted on skids or otherwise crated for protection from weather, dirt and all other injurious conditions during manufacture, shipment, and storage as approved by the machinery manufacturer from initial shipment until the time of installation. The Contractor shall submit advance information as to methods and materials that will be used for protection for approval by the Department.

D. After shipment from the manufacturer, all machinery items shall be stored at a location to be designated by the Contractor and shall be arranged to permit easy access for inspection and identification. Material shall be stored in a building in a manner that will protect from contact with the ground and cause no distortion or damage. No outdoor storage of machinery components shall be used regardless of the methods of protection provided. All large, bulky, and/or heavy items shall be securely mounted on skids or pallets of ample size and strength to facilitate loading and unloading. All small parts shall be boxed in sturdy wood or heavy corrugated paperboard boxes. A packing list enclosed in a moisture proof envelope and indicating the contents of each such box shall be securely attached to the outside of the container. The skid/pallet mounting and boxing shall be done in a manner which will prevent damage to the equipment during loading, shipment, unloading, storage, and any associated and/or subsequent handling.

E. All shipping units shall have lifting eye bolts or lifting holes properly sized for safe working loads and located to provide a balanced lift. Any eyebolts, special slings, strongbacks, skidding attachments, or other devices used in loading the equipment at the manufacturer's and/or fabricator's plant or plants shall be furnished for unloading and handling at the final destination.

F. Shaft journals that are shipped disassembled from their bearings shall be protected during shipment and before erection by a packing of oil-soaked rags secured in place by burlap and covered with heavy metal thimbles or heavy timber lagging securely attached. An alternate method may be submitted for approval. Every precaution shall be taken to ensure that the bearing surfaces will not be damaged and that all parts shall arrive at their destination in satisfactory condition.

G. Any damage that occurs to the machinery components as a result of improper protection during shipment or storage shall be corrected by the Contractor to the satisfaction of the Engineer at no cost to the Department.

3.3. **General Quality Assurance.** The Department reserves the right to inspect all machinery and verify procedures and operations being performed anytime between manufacture and at site throughout construction, including shipping. No items shall be fabricated, machined, welded, cast or forged without sufficient advance notification to the Department to permit

scheduling of inspection by the Department's designated representative. The Contractor shall furnish all facilities and provide for free access at the plant, shop or site for the inspection of materials and workmanship, and to witness shop tests. These inspections and tests will not relieve the Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements. Inspection and testing shall conform to the following requirements.

A. All dimensions and details shall be verified at the site before proceeding with any work, and to avoid causing subsequent delay in work. The Engineer shall have the authority to reject material or workmanship that does not satisfy contract requirements. The Contractor shall replace or repair to the satisfaction of the Engineer any such rejected items. All such replacements or repairs shall be made at no cost to the Department.

B. The mechanical work shall be conducted only by personnel who have been approved by the Engineer.

C. The Engineer shall be responsible for approval of all QC records and test reports submitted by the Contractor's Quality Control Manager. As used herein, certified test reports refer to reports of tests conducted on previously manufactured materials or equipment identical to that proposed for use. As used herein, mill or factory tests refer to tests required to be performed on the actual materials or equipment proposed for use. Results of the tests shall be submitted in accordance with the provisions of this Contract for laboratory test results.

D. Inspection of material and workmanship may be conducted before, during, and after fabrication, as deemed necessary by the Engineer. Materials and workmanship which are "in the process" of being fabricated and are found to contain defects or to have been subjected to damaging fabrication procedures shall be rejected while still in process. Shop approval of machinery does not relieve the Contractor from making such repairs to or replacement of parts which are found to be deficient at a later time (regardless of prior inspection or approval) as directed by the Engineer. The Engineer will have the right to perform, non-destructive tests of material and workmanship. At the discretion of the Department, QA functions may be exercised on site and at the mill and shop. The Contractor shall furnish means and assistance for testing materials and workmanship without cost to the Department.

E. Unless otherwise provided, the Contractor shall furnish without charge, test specimens required herein, and all labor, testing machines, tools and equipment necessary to prepare the specimens and to make the physical tests and chemical analyses. Copies of test reports and various tests shall be submitted to the Department. The Contractor shall furnish the Department with the number of unpriced copies of purchase orders as may be required for scheduling tests as outlined in these Special Specifications.

3.4. **Workforce Qualifications.** Only individuals of high competence shall be utilized to perform the work required by this Contract. Competence shall be evaluated through the following criteria:

A. Supervising Personnel. The installation and adjustment of all mechanical work shall be supervised and directed by foremen and supervising engineers who shall be on-site on a daily basis while work is on-going. Personnel proposed for this role shall have a minimum installation and design experience of two (2) movable bridge machinery projects in the last ten (10) years. Evidence of experience, for both machinery suppliers and subcontractors, shall be submitted in resume format to the Engineer for approval and shall include the

following:

1. Description of movable bridge machinery projects to include the type of bridge and type and size of mechanical machinery drives associated with the project.
2. Duration of each project including start and completion dates.
3. Position held for each project.
4. Location of each project.
5. References, including names and current contact information for each project.
6. Experience of machinery suppliers and subcontractors.

B. Workforce. The installation and adjustment of all mechanical work shall be performed by millwrights experienced in this class of work. The installation and alignment of machinery shall not be done by workers of any trade other than the millwright trade. The millwrights shall have a minimum of five (5) years of experience in the wide range of skills typically associated with the millwright profession. The workers' experience shall include disassembly, installation, and precise alignment of bearings, shafts, gearing and other mechanical machinery of similar size to the machinery to be worked on or supplied under this Contract. In addition, the workers shall have demonstrated experience with the tools and equipment typically associated with this type of work. Evidence of experience shall be submitted in resume format to the Engineer for approval and shall include the following:

1. Description of applicable projects over a five (5) year period, to include types and size of mechanical machinery associated with the project.
2. Duration of each project including start and completion dates.
3. Position held for each project.

C. Work Safety: The Contractor shall instruct all workers in all aspects of personal protection, work procedures, movable bridge operation, emergency evacuation procedures and use of equipment including procedures unique to this Project.

1. Shut down and lockout/tagout operating machinery electrical power while working on equipment.
2. Only work on one component at a time. Whenever the Contractor is not at the bridge Site the span is to be operational unless work is done during an approved navigation or roadway closure. Whenever disassembling or opening bearings use temporary supports to hold shafts in place.

3.5. **Speed Reducers.** Speed reducers shall be removed from the bridge site and refurbished in an approved machine shop.

A. Install gear reducers using new shim packs and new turned bolts.

B. When gear reducers are delivered immediately fill to top with oil to prevent exposure to air. Drain excess oil prior to testing.

C. Clean and paint reducer supports. Primer coat mounting surfaces.

D. Gear Reducers Oil: AGMA Lubrication Number 5S, Viscosity 198-242 cSt at 40 deg. Celsius. Oil manufacturer shall be as request by the Department.

1. R1: 75 gallons, R2: 50 gallons, R3: 100 gallons

3.6. **Open Gearing**. Open gearing shall be aligned such that backlash is within AGMA tolerance and that at least the center 50% of the face width of each pair of meshing teeth is in contact. The cross mesh shall not exceed +/- 0.001 inch per inch of face width. All open gear measurements shall be submitted to the Engineer for review and approval. The measurements shall include backlash, cross mesh alignment, tooth valley gap and face contact. The type of bluing or lubricant used for face contact measurements shall be submitted to the Engineer for approval prior to any measurements. Five (5) measurements per gearset shall be recorded spaced 18 degrees apart.

3.7. **Motors.** Motor installation and alignment falls under Mechanical work. Motor procurement and wiring falls under Electrical work. The following mechanical requirements shall also apply. The key and keyway requirements provided in this mechanical Special Specification shall also apply to the motors. The driving shaft and rear driving shaft extensions shall both accommodate the specified motor couplings.

3.8. **Bearings.** Install new roller bearings. Install one bearing fixed with a spacer ring in its pillow block and other bearing floating. Install labyrinth seal rings onto shaft on either side of each bearing prior to installing coupling hubs. Tighten taper locks and lock in-place with washer locking tab. Pack bearings with grease during assembly.

A. After removing existing bearings, hand tool clean and primer paint the existing supports and frames. Bearings will be considered properly aligned based on gearset alignment measurements.

3.9. **Couplings.** Coupling hubs are to be bored and keyseat milled to match shafts of mating components. The hubs are to be mounted in the shop by the manufacturer of the components on which they are mounted. Refer to the plans for specific coupling requirements.

A. Remove existing couplings and replace with new couplings at motor, brake and gear reducer.

B. Polish gear reducer shafts to 63 micro-inch rms finish prior to fitting new coupling hubs.

C. Install new keys into motor, brake, and gear reducer shafts.

D. When removing old hubs and installing new hubs use dry ice on shafts while hubs are heated. Do not allow shaft temperature to exceed 140 deg. F near the seals. Hub temperature should not exceed 500 deg. F. Mark the hub with temperature indicating crayon.

E. Install balanced coupling hubs and covers with balance match marks aligned and use balanced fasteners.

F. For vertical couplings install with center plate button and thrust plate in between the hubs.

G. Couplings shall be packed with new grease prior to assembly.

3.10. **Brakes.** Shoe type thrustor brake(s) shall be provided for each bridge. Brake procurement, installation and alignment falls under Mechanical work. Brake wiring falls under Electrical work.

A. Brake torque shall be set in the shop, verified with a torque wrench (or comparable method approved by the Engineer) and adjusted to within 10% of the required setting; the brake torque shall be rechecked at installation in the field per the approved method and adjusted as required. The thrustor brake settings shall not be more than 90% nor less than 40% of its continuous rated capacity for normal operation.

B. The brake sequence shall be as follows (unless dictated otherwise by system behavior during initial startup and testing):

1. Motor brake to set with a 1 second time delay with the motor.
2. Machinery brake to set with a 3 to 4 second time delay.

3.11. **Machinery Refurbishment.** The existing machinery shall be removed and refurbished in a certified machine shop except were provided otherwise on the Contract Plans. It is the contractor's responsibility to dispose of existing machinery and other equipment that is not to be refurbished and associated items in accordance with applicable laws and regulations.

3.12. **Coordination.** The Contractor shall be responsible for the coordination of the machinery installation with all other aspects of the construction project. This coordination relates to the sequencing of work so that all machinery can be installed in a safe and effective manner. Certain sequences of installation may be required in order to ensure that all items can be installed on the bridge. The sequences of installation shall be included in the Contractor's written installation procedures for the machinery components.

3.13. **Machinery Installation.** Installation work shall not commence until all required components have been manufactured and approved for installation, all required procedures and schedules have been approved and preparations by others where required have been satisfactorily completed.

A. During installation, the Contractor shall lubricate all rotating and sliding parts of the machinery including span drive machinery, and span lock machinery with lubricant as identified on the approved lubrication charts from installation until final acceptance. The surfaces of all components that will rotate or slide relative to one another once assembled shall be lubricated prior to assembly. Any corrosion which should occur on machinery during the construction/installation period shall be removed and the surface returned to bare metal prior to applying fresh lubricant. Machinery disassembly may be required to facilitate this repair work if so directed by the Engineer. Where corrosion is extensive and cannot be removed without marring the base surface, or where the machinery surface is marred by corrosive pitting, the component shall be returned to the shop for repair.

B. All mechanical components shall be erected, located, adjusted, leveled and plumbed to the position and tolerances as shown on the Contract Plans and in the approved construction submittals. Any mechanical components not erected to the specified tolerance will be rejected. Rejection shall be due cause for the Engineer to stop future work, which would be constructed using or with reference to these parts until such parts are properly aligned.

C. Final reaming of holes for turned bolts shall occur only after the Engineer's approval of the field alignment unless indicated otherwise on the Contract Plans.

3.14. **Machinery Alignment.** All components of standard manufacture (i.e., couplings, brakes, etc.) shall be aligned to the tolerances specified by the manufacturer of that component. The manufacturer's recommended alignment tolerances for a new installation shall be the basis for alignment and shall be included in the relevant procedures. All components of custom manufacture shall be aligned to the tolerances provided in these Contract Documents.

3.15. **Operation.** The machinery shall not be operated with the electric motor/drive at full speed until the installation alignment requirements identified in this section, or in the manufacturer's literature for components not listed in this section, are met. The machinery shall be operated via manual operation, or at motor creep speed pending approval of the engineer.

3.16. **Rack and Rack Pinion.** The alignment of the rack pinion will be considered acceptable when

the backlash is within the range indicated on the contract documents, and when the tooth contact is at least 75% at every rack tooth. The Contractor shall demonstrate acceptable face contact to the Engineer by bluing the teeth or other means acceptable to the Engineer.

3.17. **Trunnions.** Refurbishing of the trunnion collars will require shifting the span transversely or unloading force from the bascule girders applied to the trunnion collars to be removed and replaced. Relieve of preload between the tunnion collar and trunnion hub is necessary to install each collar half. Contractor responsible for means and methods to shift the trunnion hub axially on its journal. This includes fabricating and machining a flange to set into the trunnion groove for jacking against the trunnion and trunnion hub in axial direction.

3.18. **Live Load Equalization.** Loading between the pair of live load supports shall be equalized at installation.

A. The following procedure is suggested as a basis for equalizing the loading for the supports at one end of the span. The span balance shall be adjusted for span heavy condition in the seated position. This adjustment procedure shall be repeated such that the pair of live load bearing are sitting properly at one time.

1. Allow the span to settle down, bringing at least one (1) live load shoe into contact with its strike plate.

2. If both live load shoes contact their strike plates, raise the span and insert a temporary shim 1/2-inch-thick under the east shoe (Se). Lower the span, and measure the clearance (Cw) under the west shoe (Sw). Raise the span and remove the 1/2-inch temporary shim from under the east shoe and insert it under the west shoe. Lower the span, and measure the clearance (Ce) under the east shoe. If Ce is greater than Cw, additional shims must be installed under Se with a thickness of $T = (Ce - Cw)/2$. If Cw is greater than Ce, additional shims must be installed under Sw with a thickness of $T = (Cw - Ce)/2$.

3. Following installation of shims determined above, seat the span and verify uniform contact at both live load supports as verified by contact across the width of the strike plates. Contact will be considered acceptable when the maximum gap between the live load shoe and the strike plate is less than 0.005-inch and contact exists at one or more points between these two surfaces.

4. After acceptable live load equalization has been obtained, uniform shim adjustments may be required at both live load supports if the engineer determines that the elevation of the roadway joint does not meet the approach joint.

3.19. **Prerequisites for testing.** Functional testing shall not commence until Contractor has demonstrated proper alignment of all machinery components to the Engineer as indicated in these Special Specifications. The Contractor shall prepare and submit a functional testing procedure in accordance with the requirements of this Item to the Engineer for approval.

3.20. **Span Drive Brakes.** Prior to operating the leaf after installation of the span drive machinery, the span drive brakes shall be electrically tested to verify proper function. The proper torque setting of the thrustor brake shall be physically verified with a torque wrench. Time delay settings for thrustor brakes shall be verified. The function of the limit switches and electrical interlocks shall be tested.

3.21. **Initial Operation via Electric Motor.** The initial operation of the machinery via the electric motor shall be conducted at reduced speed, and loading shall be monitored via strain gage

testing as provided for under the strain gage provisions of the Bridge Balance specification. As part of this testing, machinery alignment shall be verified over the full range of bridge operation, shaft indexing shall be performed as necessary to equalize loading between the two pinions, and bridge balance shall be adjusted as required. Achieving acceptable alignment, balance, indexing and loading are pre-requisites for proceeding to full speed bridge operation.

3.22. **Operational Testing via Electric Motor.** After meeting all of the requirements of the Contract Plans and the Special Specifications with regard to machinery installation, alignment, and bridge balance, the span shall be operated through no less than ten (10) consecutive opening cycles to demonstrate proper mechanical functioning of the bridge in its fully constructed state. Each opening cycle shall comprise operation of the span from the fully closed position to the fully open position and back to the fully closed position at normal operating speed. Throughout this testing all mechanical components shall be monitored for any abnormal movement, vibration, noise or heating. Any noted deficiencies shall be corrected by the Contractor to the satisfaction of the Engineer at no cost to the Department. Any such deficiencies shall be cause to re-initiate the Functional Testing following the correction of such deficiencies.

3.23. **Operational Testing via Emergency Gearmotor.** After setting the clutch torque, test the emergency drive clutch using the main motor brakes. The emergency drive should turn through one motor brake and the clutch should slip with both motor brakes set. Tune the clutch setting to also slip while measuring not more than 150% of one main motor full load current.

3.24. **Emergency Stop Testing.** Testing shall be conducted to evaluate behavior of the movable span under an emergency stop with the span moving at 25% of full speed. Throughout this testing all mechanical components shall be monitored for any abnormal movement, vibration, noise or heating. Any noted deficiencies shall be corrected by the Contractor to the satisfaction of the Engineer at no cost to the Department. Any such deficiencies shall be cause to re-initiate the Functional Testing following the correction of such deficiencies.

3.25. **Bolting and Anchoring.** Bolt holes in structural steel for connecting machinery shall, in general, be drilled from the solid after final alignment of the machinery. Erection holes, subdrilled 1/4-inch undersize, for temporary bolts may be used for erection and alignment of the machinery. When the machinery is aligned in its final position, full-size holes for the remaining bolts shall be subdrilled and reamed, the full-size bolts installed, and the temporary bolts removed and the bolt holes for temporary bolts reamed full size and bolts installed.

A. Wherever possible, high-strength bolts connecting machinery components to structural elements or to other machinery components comprised of different thicknesses shall be installed such that the bolt head is adjacent to the connected element with the least thickness.

B. Machinery fit bolts and high strength bolts shall be torqued to the same tension required for ASTM F3125 Grade A325 bolts specified in the Standard Specifications.

C. Torques for turned bolts, cap screws, and other grades of bolts shall be proportioned to develop a preload of 70% of their yield strength, unless otherwise noted, and shall be indicated on the Work Procedure.

D. Determine torque value using the Skidmore-Wilhelm apparatus for each bolt thread size and material variation. Perform the test with the recommended or approved equal thread lubricant to also be used for torquing bolts at installation.

E. Unless otherwise noted install nuts on bolts with a moly anti-seize lubricant, marine grade to reduce torque applied to bolt, hold the threaded connection, and prevent corrosion. Install

fasteners into tapped holes with an approved thread-locker coating as defined herein.

F. Existing anchors that cannot be reused with new nuts and washers shall be pulled out and replaced with new epoxy anchors defined herein.

G. Follow manufacturer's recommendations for installing anchors. Blast clean holes. Install heavy hex double nuts and washer. Torque anchor nuts to 50% of its pull-out capacity. Re-check torque one-week and again one-month after initial tightening of nuts.

H. Equipment secured with anchors shall be installed level using non-shrink high strength grout. Align machinery using jacking screws. After grout sets remove jacking screws and fill hole with grout.

3.26. **Lubrication.** The maintenance of the lubricant, method of application and re-lubrication intervals, shall be as recommended by either the fabricator or lubricant manufacturer.

A. During assembly bearings and couplings shall be packed with new grease.

B. Lubrication systems and grease fittings for each component shall be tested such that grease flows through ports and fills up grease cavities and purges out air pockets. Visually check that new grease distributes during operating. Testing shall ensure that dissimilar lubricants do not mix or contaminate one another.

C. Prior to final testing completely purge grease ports with new grease until fresh grease runs out from relief ports.

3.27. **Cleaning and Painting.** All machinery external surfaces shall be cleaned with final surface preparation, prior to painting, done by either blast cleaning as per SSPC-SP6 "Commercial Blast Cleaning" or hand tools and power tool cleaning as per SSPC- SP 2 and 3 with the following exceptions:

A. The following excepted machinery or equipment shall be cleaned with solvent to meet the requirements of SSPC-SP 1. Generally, these surfaces are not painted, however remove excess grease for painting non-wearing surfaces of these components.

1. Seals and gaskets
2. Faying surfaces of machined tolerance fits.
3. Limit switches
4. Bronze and stainless-steel parts
5. Any machinery surface in sliding contact during operation.

B. Surfaces shall be cleaned of all chips, burrs, dirt, rust, mill scale, sand, grease, and other extraneous materials by employing methods such as chipping, grinding, wire brushing, solvents, followed by the required abrasive blast cleaning and residual dust removal by compressed air. Finished machined surfaces not to be painted shall be masked or shielded from abrasive blasting operations.

C. Painting requirements encompass shop painting and field touch-up of machinery components and associated support surfaces. All new and rehabilitated machinery, including couplings, supports, and fasteners, shall be painted in their entirety except for machined contact surfaces.

D. Caution shall be exercised during cleaning and painting operations to prevent cleaning and painting materials from entering machinery components and coming into contact with sliding

surfaces on components such as bearings, seals, gears, couplings, and other components which would be damaged by such intrusion. Nameplates shall be clean and kept free of paint. Detailed instructions for painting, including paint manufacturer information and surface preparation of the machinery, shall be provided on the Shop Drawings for review by the Engineer.

E. The painted surfaces shall be free from dry spray, over spray, runs, sags, drips, excessive paint build-up, ridges, waves, laps, streaks, brush marks and variations in color, texture and finish (glossy or dull). The coverage shall be complete and each coat shall be so applied as to produce an even film of uniform thickness, completely coating corners and crevices, and bonded to the underlying surface. When spot repairs are necessary, the edges of the surrounding coating shall be feathered, leaving surfaces prior to painting, tapered and free of loose or damaged coating. Care shall be exercised to avoid over spraying or spattering paint on surfaces not to be coated. Damage to surfaces not to be coated shall be repaired by the Contractor at the Contractor's expense.

F. Factory painted machinery items shall either be painted with a top-coat color matching as close as possible to the top-coat color, as discussed herein, or shall be hand tool and solvent cleaned and overcoated with the top-coat of the specified paint system in the appropriate color as discussed herein. The Contractor shall coordinate required paint colors with the machinery component manufacturers. Manufacturer's coat colors shall be submitted to the Engineer for approval.

G. After proper surface preparation to bare metal, machinery surfaces shall be coated with a 3-coat system applied as per the manufacture's temperature and humidity requirements for application. If environmental conditions are not suitable for painting in accordance with paint manufacturer's requirements, the contractor shall provide a temporary conditioned enclosure over the area to be painted in the field; maintain suitable temperature and humidity and protect the area from weather at no additional cost.

H. Machined surfaces for fit-up with other components to have one primer coat.

I. Coatings application shall be in accordance with the manufacturer's recommendations, SSPC PA 1 Paint application Specification No. 1, and these specifications, whichever is more stringent. Coatings shall be applied only to surfaces prepared in accordance with the manufacturer's recommendations and these specifications.

J. After completion of the operating tests and acceptance of the machinery, all oil, grease, dirt, and other foreign matter shall be cleaned from the exposed machinery surfaces which require the third coat of paint, including bolts, and those shop painted surfaces that were damaged and repaired with field applied primer, including applicable surfaces on the advance procurement machinery components. The exposed surfaces shall then be given a final top-coat, which shall color-code the machinery to identify fixed and moving parts in the machinery room.

4.0 OPERATING AND MAINTENANCE MANUALS

4.0. **Operating and Maintenance Manuals** giving complete instructions relative to assembly, installation, operation, adjustment, lubrication, maintenance, disassembly and carrying complete parts list shall be furnished for every item of equipment furnished by the Contractor.

A. Provide separate abridged version operations manual and separate abridged version maintenance manual. These versions are to be a pocket guide format with "need to know"

information.

B. Equipment furnished under each Special Provision Section including Electrical Section(s) are to be included in the Manuals. Refer to Electrical Specification for operation and maintenance manual requirements.

C. Maintenance Manuals shall contain descriptive material, catalog cuts with non-pertinent data blocked out, as-built drawings, spare parts list, troubleshooting techniques and any and all information necessary for successful maintenance of the bridge functional systems and each piece of equipment furnished by the Contractor. Bridge functional systems shall be understood to include all span operating machinery, span lock machinery, gates, electrical service equipment, electrical and control systems, air conditioning and plumbing equipment, and all other equipment for which periodic maintenance and operation is desirable. Subsequent to the break-in period, errata or addenda to the manuals should address any revisions required.

D. Operations Manuals shall contain written descriptions of the functional systems of the movable bridge, step-by-step operating instructions for each of these systems and all information and directions required for their successful operation. Subsequent to the break-in period, errata or addenda to the manuals should address any revisions required. Operation of control house heating, cooling and plumbing equipment shall be included.

4.1. **Publishing of Printed and Scanned Material.** All printed matter, data, drawings, catalog cuts, diagrams, etc., shall be produced by methods to result in legible text and figures of permanence and durability, including paper that is water resistant. No materials shall be used which will adversely affect this permanence and durability.

A. Electronic scans of all documents shall be provided in Adobe® PDF format and include a table of contents with links to each section of the manuals. All text and drawings shall be scanned in color at a minimum of 300 x 300 DPI. Documents that are originally in an electronic format can be directly imported into the PDF files for the manuals. Electronic manuals' file names and folders shall be named and organized with bookmarks to match with the printed manuals.

B. Enable bookmarking of individual documents based upon file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.

C. Operating and maintenance manuals shall be bound in heavy-duty nickel-plated three ring binders with double trigger locking D-ring that keeps rings aligned. Back mounted D-rings shall allow sheets to lie flat. Covers shall be stiff heavy vinyl with view sleeve on front cover and outside binding.

D. The printed material shall be bound into each manual between rigid covers. The manuals shall be approximately 9 inches by 12 inches to contain the drawings without excessive folding so that they may be easily opened. The books shall be labeled with a descriptive title, the name of the project, the location, the year of installation, the name of the manufacturer, the engineering firm and the Contractor. Copies of drawings shall be in black on white background and shall be legible.

E. Paper used in these manuals shall be 20-pound, punched paper, water resistant, and acid free of a quality suitable for archival use. Paper shall have 5/16-inch minimum diameter holes, reinforced with plastic or cloth at the standard three (3)-hole spacing. The paper shall be standard 8½"x11", or, in the case of larger foldout diagrams and illustrations, folded to approximately 8½"x11" size. No paper or other material shall extend beyond the manual covers.

F. The Contractor shall assume responsibility for the systems provided by subcontractors and/or vendors. No disclaimer of any sub-Contractor or vendor shall apply to the overall bridge system as described in the operating and maintenance manuals.

4.2. **Organization**. Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system.

A. Each line item of the Table of Contents shall be separated by a polyethylene divider, color coded, with a lettered or numbered tab corresponding to the Table of Contents line item.

B. Number and list by section in the Table of Contents all literature and descriptive materials included in any manual.

C. The following table of contents is not intended to be a complete table of contents and the Contractor shall include all information which may be helpful in maintaining the bridge functional systems.

4.3. **Operation Manuals**. Operating Manual-Suggested Table of Contents: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. Refer to Electrical Work and Specifications.
2. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
3. Operating standards.
4. Operating procedures.
    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.
    d. Emergency Operation
    e. Auxiliary Drive Operation
    f. Brakes Manual Operation
    g. Span Locks Manual Operation
    h. Regulation and control procedures.
    i. Instructions on stopping.
    j. Normal shutdown instructions.
    k. Seasonal and weekend operating instructions.
5. Air conditioning equipment; heat pump system, electric heaters, and ventilation.

6. Plumbing equipment; pumps, tanks, and water heaters.

7. Precautions against improper use.

8. License requirements including inspection and renewal dates.

9. Lockout steps for the electrical power during various maintenance procedures. These procedures shall include lock-out of disconnect switches or circuit breakers of the corresponding devices being maintained. Furthermore, tag-out lockbox shall be installed in the control room to secure the control console key. The lock-out and tag-out steps shall be in conformance with the latest Occupational Safety and Health Administration (OSHA) requirements.

4.4. **Systems and Equipment Maintenance Manuals**. Mechanical Maintenance Manual-Suggested Table of Contents

1. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below. Include electrical systems and equipment.

2. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

3. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

   a. Standard maintenance instructions and bulletins.

   b. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.

   c. Identification and nomenclature of parts and components.

   d. Product Information:

   - Product name and model number.
   - Manufacturer's name, address, and technical support contact information.
   - Material and chemical composition.
   - Reordering information for specially manufactured products.

4. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

   a. Test and inspection instructions.

   b. Types of cleaning agents to be used and methods of cleaning.

   c. Troubleshooting guide.

   d. Thermostat programing

e. Precautions against improper maintenance.

f. Disassembly; component removal, repair, and replacement; and reassembly instructions.

g. Aligning, adjusting, and checking instructions.

h. Demonstration and training video recording, if available.

5. Maintenance and Service Schedules, and Lubrication Charts: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

a. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.

b. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

c. Lubrication Charts: Machinery assembly drawings shall clearly show all equipment and indicate lubrication frequency, type of lubricant, and method of application defined in a legend on the drawing. Use symbols for identification of lubrication.

d. Plumbing maintenance of pumps, tanks, heat trace, and water heaters.

6. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

7. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

8. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

a. Include procedures to follow and required notifications for warranty claims.

B. Electrical Maintenance Manual-Suggested Table of Contents

1. 1. Refer to Electrical Work and Specifications

4.5. **Pocket Guide Manual Requirements and Content**

A. List of lubrication points separated into headings for each assembly and sub-assemblies

B. Trouble Shooting Guide: List of interlocks and control switches with locations.

C. Step by step instructions for using the auxiliary drive.

D. Step by step instructions for manual operation of the span locks.

E. Representation of the full one-line diagram.

F. Step by step instructions on how to operate in main mode and in auxiliary mode as well as how to switch between the two.

5.0 METHOD OF MEASUREMENT

5.1. **The Work** shall be measured for each machinery pay item consisting of:

A. 599.061201WE Rehabilitate Span Drive Machinery:

1.	Span Drive Machinery – Removed	8% Lump Sum
2.	Span Drive Machinery – Delivered	35% Lump Sum
3.	Span Drive Machinery – Installed	35% Lump Sum
4.	Final Acceptance	20% Lump Sum
5.	Operation and Maintenance Manuals	2% Lump Sum

B. 599.061202WE Refurbish Trunnions — Lump Sum

C. 599.061203WE Machinery Field Painting — Lump Sum

D. 599.061204WE Service Reducers — Lump Sum

E. 599.061205WE Replace Span Locks and Miscellaneous Repairs:

1.	Span Lock Machinery – Delivered	50% Lump Sum
2.	Span Lock Machinery – Removed/Installed	50% Lump Sum

6.0 BASIS OF PAYMENT

6.1. **The Work** will be paid for at the contract lump sum price for each listed pay item herein which shall include all materials, equipment, and labor necessary to complete the work as identified on the plans and as noted herein.

6.2. **Final Payment** for operating machinery will not be made until all the project closeout data submittals have been completed, and the work has been tested and functions to the satisfaction of the Department.

A. Payments will be paid under:

1. Item 599.061201WE – Rehabilitate Span Drive Machinery
2. Item 599.061202WE – Refurbish Trunnions
3. Item 599.061203WE – Machinery Field Painting
4. Item 599.061204WE – Service Reducers
5. Item 599.061205WE – Replace Span Locks and Miscellaneous Repairs

ITEM 599.061301WE BRIDGE BALANCE

1.0 DESCRIPTION

1.1. **Span Balance Requirements** The accepted span balance design criteria is defined in polar coordinates as a magnitude of moment in kip-feet and angular direction with the trunnion center as the origin. Zero degrees is horizontal toward the toe end of the span. In cartesian coordinates the x axis is horizontal, y axis is vertical, and z axis is transverse to the span along the axis of the pair of trunnions. The origin is also centered between the pair of trunnions in the z direction. The span existing baseline z direction transverse imbalance is assumed to be zero.

A. **Construction Balance Criteria.** Whenever the bascule span is in service for roadway and operational for passage of marine vessels the span imbalance shall be between 175 kip-feet to 600 kip-feet and angle of 330° to 60° (-30° to 60°). When the span is seated there shall always be a reaction of at least 1,000 pounds per end floorbeam bearing. In the transverse z direction, the span shall always be balanced within +/- 300 kip-ft (calculated).

B. **Final Balance Criteria.** 200 kip-feet to 350 kip-feet and angle of 345° to 45° (-15° to 45°). When the span is seated there shall always be a reaction of at least 1,200 pounds per end floorbeam bearing. In the transverse z direction, the span shall be balanced as per submitted and approved calculations.

1.2. **Balancing and Testing.** This work shall include balancing and balance testing the bascule span to ensure compliance with the span design balance criteria. Under this item the work includes:

A. Balance testing performed using the dynamic strain gage procedure described in this provision.

B. The Contractor shall employ the services of an established testing company experienced in dynamic strain gage measurement of movable bridge imbalance, subject to acceptance of the Department. Such experience shall be demonstrated by identifying a minimum of six movable bridges including at least three trunnion bascule bridges for which the company has provided complete and satisfactory dynamic strain gage measurements and reporting. The measurements shall be made under the immediate direction of a Professional Engineer registered in the State of New York who has had hands-on experience measuring movable span imbalance by the dynamic strain gage procedure. Acceptable testing companies include but are not limited to:

1. Gresham Consulting LLC, Chalfont, PA
2. Wiss Janney Engineering (Stafford Bandlow Engineering), Doylestown, PA
3. Modjeski & Masters, Mechanicsburg, PA

C. **Scope of Work.** The approved testing company shall perform strain gage balance testing and prepare balance summary tables prior to and during construction. Contractor shall maintain and update these tables for tracking the span imbalance due to weight added and removed from the span throughout the work.

D. Prepare and submit the balance procedure and methods, balance calculations and tables, strain gage test procedure and report for each test.

E. All other work required to complete the Work, including placing and adjusting the balance blocks within the counterweight pockets required for balancing the span. This includes placement and removal of temporary ballast as required during various phases of

construction. This also includes repeated readjustment of balance blocks as necessary until the span is balanced as specified. Documentation is required for all balancing work, including temporary balancing during construction.

F. Clean out debris, sand, and other non-ballast objects from the counterweight pockets. There are four counterweight pockets, two upper and two lower pockets set into the counterweight and accessible from the catwalk hung from the approach deck in between the bascule girders. The upper pockets are 13 ft. x 3 ft. and the lower pockets are 9 ft. x 5 ft. All pockets are 2.5 ft. high. The lower pocket has a restricted opening 2.5 ft. square. Refer to original 1927 drawing sheet 16 of 31 sheets.

2.0 MATERIALS

2.1. Strain Gages and Cables

A. Provide new shear configured strain gages for measuring angular distortion. Gages shall be waterproof and bonded to a stainless-steel foil. Lead wires shall be shielded.

B. Provide new 4 conductor heavy duty shielded cables with vinyl jacket. Provide sufficient cable length to wrap around shaft during span operation to full open.

2.2. Balance Blocks

A. 25,000 pounds of painted steel ballast blocks made from ASTM A36 steel or cast-iron ASTM A48. All blocks to have the same dimensions and weigh between 50 and 100 pounds +/- 2.0 pounds. Include hole or handle for lifting.

2.3. Coatings

A. The paint coating system shall be in accordance with Section 572.

B. Lead Encapsulant Coating: epoxy-based paint for encapsulation of lead that is abrasion and impact resistant, waterproof and weatherproof.

3.0 CONSTRUCTION DETAILS

3.1. **General Requirements.** All Work shall be subject to the requirements of Volume 1, Section 100 of the Standard Specifications.

A. No disassembly or removal of existing machinery, or installation and assembly of new mechanical components shall commence without approved demolition, installation and/or alignment procedures and supporting Assembly or Erection Drawings.

B. Calculations shall be signed and sealed by a licensed Professional Engineer.

3.2. **Submittals.** Qualifications of the strain gage testing company to perform the imbalance measurements shall be submitted to the Department for acceptance. Required qualifications are specified.

A. Work Procedure: Submit a detail list of the work procedure to be followed. Include testing equipment catalog cuts or description of equipment.

B. Submit balance summary tables. Include figures and tables to exhibit method of approach and summarize results.

C. Submit strain gage test report prior to start of work, at end of Phase 2 work and again at end of Phase 3 work.

3.3. **Measurements and Verification.** Verify; balance block weights, quantity, and locations in each counterweight pocket prior to submitting reports. Weights of parts and ballast added and removed from the span shall be recorded with their distance to the trunnion.

3.4. **Notice of Testing.** The Contractor shall give no less than ten (10) working days' notice to the Department of the span test openings to measure span imbalance.

3.5. **Balance Blocks.** Use the average measured weight of ten painted balance blocks for the balance calculations. All lead ballast either existing or new if reused must be encapsulated with protective coating. Remove and dispose of all existing lead ballast up to 5,000 pounds and replace with steel ballast. Deliver spare steel balance blocks to the Department's local facility for storage.

3.6. **Balance Calculations & Balancing During Construction.** During the work the contractor shall maintain the balance of the span to within the specified acceptance criteria unless the span is pinned to the bascule pier, tied-down, or the counterweight is supported.

A. Balance calculations and summary tables shall be coordinated with structural shop drawings and any other miscellaneous or incidental work to be incorporated.

B. Document the exact locations of component weights in three dimensional cartesian coordinate system with the trunnion as the origin. The quantity and location of required temporary ballast based on weight added or removed from the span and the specified balance requirements shall be computed and tabulated for tracking imbalance.

C. For all balance summary table submittals, a narrative shall be included with the outline of the proposed balance, the duration of the imbalance condition, and all other aspects of the work in accordance with the approved construction schedule. This information shall be coordinated with the Contractor's scheduling requirements. The balance summary tables shall be updated by the Contractor throughout construction and shall be submitted to the Department weekly as required to meet the requirements in these Specifications.

3.7. **Balancing.** When the span is not pinned or secured in either the open or closed position the Contractor shall place and adjust the balance blocks within the counterweight pockets for adjusting to specified balance acceptance criteria. This includes testing and repeated readjustment of balance blocks as necessary until the leaves are balanced as required. The final measured imbalance shall be considered acceptable if the center of gravity is within the specified location and magnitude of imbalance.

A. Remove and clean out debris, sand, and water contamination of counterweight pockets. Balance blocks shall be packed neatly together without voids, filling the pockets from back (furthest from trunnion) to front of the pocket. Blocks shall not be wedged against the sides of the pocket.

B. Blocks must be equally distributed transversely across the counterweight. Place blocks in upper or lower row of pockets to adjust the span vertical imbalance. Any existing balance blocks removed and replaced or added balance blocks must be done symmetrically about the counterweight centerline such that transverse z direction balance is preserved or improved toward true balance.

C. It shall be the Contractor's responsibility to provide and safely secure hoisting equipment for moving and placing the blocks.

D. Department's review of the balance summary table and quantity and location of balance blocks does not relieve the Contractor from making additional changes in the balance blocks

location and quantity installed as deemed necessary to balance the span. All changes shall be submitted for acceptance. Bolting or welding ballast plates to the exterior of the counterweight girder is not acceptable.

3.8. **Imbalance Measurements.** The Contractor shall measure the actual imbalance moment and determine the location of the span center of gravity using the strain gage testing method as defined herein.

A. Initial Test – Prior to starting work measure the existing imbalance of the span as a baseline.

B. Prefinal Test - If balance testing indicates that the imbalance is not within acceptance criteria limits defined herein, further balance adjustments and imbalance measurements are to be performed until the criteria specified are met.

C. Final Balance Test -. If balance testing indicates that the imbalance is not within acceptance criteria limits defined in the Plans, further balance adjustments and imbalance measurements are to be performed until the criteria specified are met.

D. The strain gauge testing company shall furnish and install the required strain gages, all cabling and transmission equipment, data acquisition equipment, and produce fully documented reports detailing the results of the measurements.

E. The testing company shall submit the following items to the Department for approval:

1. Description of experimental procedure including type and method of installation of strain gage rosettes, method of transmission of low-level signals, and data acquisition equipment.

2. Layout of span drive machinery showing proposed location of strain gages, amplifiers, cable or radio links, data acquisition equipment and all associated cabling.

3. Elementary wiring diagrams of interconnection of strain gages, amplifiers, and data acquisition equipment.

4. Sample computations of shaft torque from measured strains, span imbalance, curve fitting and basis for friction correction.

F. Strain gauge and equipment installation, strain measurement, and torque calculations shall be in accordance with the following:

1. Two strain gauges shall be affixed to the lowest speed shaft that is accessible in accordance with the strain gauge manufacturer's installation instructions. The gauges shall be connected such that any bending strains in the shaft will be canceled. The areas of the shaft where the gages are to be mounted shall be sufficiently cleaned to bare metal removing paint or rust.

2. The strain gauge leads on the shaft shall be connected to a four-arm amplifier. Transmission of signals from the gauges to the data acquisition equipment shall be either through cable links or amplified and then through wireless transmitters.

3. An inclinometer shall be provided to provide continuous span angle to the data logging equipment.

4. The strain in the shaft shall be recorded simultaneously versus span opening angle during opening and closing to a suitable sampling rate. At least 3 opening/closing runs shall be made, when the wind speed is less than 5 MPH and the bridge deck is visibly

dry. Wind-up torque in the operating machinery shall be released while calibrating the gages verified by space between the faces of the engaged teeth of main pinion and gear.

5. The strains induced in the shaft shall be numerically converted to torque by applying fundamental stress-strain relationship calculations for each strain plot for both opening and closing. This data shall be processed to give span imbalance (kip-feet) versus opening angle, corrected for friction, at each trunnion. From them, plots of total span imbalance shall be prepared.

G. The reports shall contain the following:

1. Introductory section giving the name of the bridge, the date of the measurements, weather conditions during measurements and any other information requested by the Department.

2. Description of testing procedure and equipment used.

3. Span drive diagram showing location at which strain gages were attached and all applicable gear ratios.

4. Description of relationships and sample calculations for obtaining shaft torque from strain, span imbalance from shaft torque, curve fitting and basis for friction correction.

5. Data plots versus degree of opening during each opening/closing run and fitted imbalance curves and friction curves.

6. Tabulation of imbalance moment, angular location of moment, friction, and seated reaction for each run including the average value.

4.0 METHOD OF MEASUREMENT

4.1. **The Work** will be paid for at the contract lump sum price for "Balance Bascule Leaves", which shall include all materials, equipment, and labor necessary to complete the work as identified on the plans and as noted herein.

A. This work will not be compensated until the Department determines that the work has been tested and functions to the satisfaction of the Engineer.

B. Final payment will not be made until all the project closeout data submittals have been completed. Once the completed package has been received in its entirety, the Department will make the final payment to the Contractor.

5.0 BASIS OF PAYMENT

5.1. **The Work** will be paid for at the contract lump sum price which shall include all materials, equipment, and labor necessary to complete the work as identified on the plans and as noted herein.

5.2. **Payment** will not be made until all the submittals have been completed, and the work has been tested and functions to the satisfaction of the Department. The schedule of payments for this item shall be made as per agreement with the Department.

A. Payments will be paid under:

1. 599.061301WE - Bridge Balance

ITEM 599.061701WE CONTROL HOUSE HVAC

1.0 DESCRIPTION

1.1. **Notice of Beginning of Work.** The provisions of §564-1, Structural Steel standard specification for NYSDOT shall apply and is supplemented herein. The Contractor shall give the WCDPW ample notice of the beginning of work at the fabrication area, so that a Department Representative may be on hand for inspection. No material shall be manufactured, or work performed before the WCDPW has been so notified.

1.2. **Governing Standard**. The governing standard for all mechanical HVAC work shall be the 2020 Building Code of New York State, and IMC 2021.

1.3. **Standards.** Standards referred to in these Special Specifications and on the Contract Plans are published by the following organizations and are directly applicable to the material and workmanship required for this work.

A. Design and Installation Standards

1. ASHRAE Handbook – HVAC Systems and Equipment, current chapter on duct construction.
2. AMCA Standard 210, Test Code.
3. ASHRAE Standard 70-72, Method of Testing for Rating Fans for rating performance of Outlets and Inlets.
4. ASTM C1071: Microbial growth resistant coatings.
5. IMC, International Mechanical Code, 2021 Edition.
6. NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems, 2021 Edition.
7. SMACNA HVAC Latest Editions of the following:
   a. Duct Construction Standard - Metal and Flexible
   b. Duct Systems Inspection Guide
   c. HVAC Systems Commissioning Manual
   d. HVAC Systems Testing, Adjusting and Balancing

B. Fire and Smoke Rating Test Standards

1. ASTM E84, NFPA 255, and UL 723.

2.0 MATERIALS

2.1. **General Materials and Workmanship**. All materials shall be new unless otherwise indicated and shall meet the minimum requirements of the standards indicated on the Contract Plans and as specified herein. All materials shall be supplied by approved manufacturers as defined herein.

2.2. **Substitutions**. Items specified by manufacturer name or part number on the Contract Plans may be replaced by an equivalent item by another manufacturer, subject to approval by the Engineer of Record that satisfy all listed requirements. All changes required by the substitution shall be made by the Contractor at no additional cost to the Department. Item equivalency shall be determined at the sole discretion of the Engineer of Record and may be based on one or

more of the following: quality, function, ease of maintenance, physical size, reliability, value, rating, durability, availability, and other criteria as deemed appropriate by the Engineer of Record.

A. The terms "approved equal", "of equal quality" and "or equal" which may appear on the Plans and in these Specifications are intended to allow the Contractor to submit for review other manufacturers and model numbers of products of equal quality and rating for those specified.

B. Prior to the Contractor's ordering of any substitute product, the Engineer's acceptance of the equivalence of the substitute product shall be obtained in writing. The acceptance of the substitute products is at the sole discretion of the Department who will establish the basis for equivalence and will review the quality of the materials and products described in detail on the submitted Shop Drawings and product data.

C. Acceptance by the Department of any substitute products submitted by the Contractor shall not relieve the Contractor of responsibility for the proper operation, performance, or functioning of that product.

D. Where a product is specified by a manufacturer's name and catalog or part number in this Specification or on the Plans, it is so specified to establish quality, configuration, and arrangement of parts. An equivalent product made by another manufacturer may be submitted for review for the specified product subject to the acceptance of the Department; however, all necessary changes required by the substitution in related structural, architectural, and electrical parts, shall be made by the Contractor at no additional cost.

2.3. **Refrigerant Piping.** Furnish and install refrigerant piping used in air-conditioning applications that is acceptable to the manufacturer and in accordance with approved equipment vendor requirements, warranties, and standards.

A. Refrigerant piping shall be seamless copper tube type ACR meeting either ASTM B1003 or B280.

B. Insulation on gas and liquid refrigerant lines shall be 1 inch thick with UV protective and weather resistant jacket. Shall meet operating temperature -70 degrees to 220 degrees Fahrenheit as per ASTM C534.

C. Use Flare Connections and nuts in accordance with ARI (Air Conditioning and Refrigeration Institute). Properly tighten the flare connections and be careful not to over tighten. Use torque wrench and tighten to the approved level.

D. Flexible connectors shall be 500 PSI minimum operating pressure; dehydrated, and pressure tested.

2.4. **Heat Pump System.** Per the equipment schedule, the heat pump air conditioning system basis of design is Mitsubishi Electric

A. Control House Operator Level and Machinery Room: S Series VRF (Variable Refrigerant Flow) multi zone system heating and cooling.

B. Electrical Room: P Series single zone system heating and cooling.

C. Refrigerant shall meet ASHRAE 34, R-410A unless phased out. Otherwise, it shall conform with latest EPA approved refrigerant.

D. Acceptable alternative manufacturers, assuming compliance with these equipment

specifications, are Daikin, Panasonic, and Carrier. Contractor is responsible for all specified items and intents of this document without further compensation.

E. An equivalent product made by another manufacturer may be submitted for review for the specified product subject to the acceptance of the MBTA; however, all necessary changes required by the substitution including coordination with all other work including architectural and electrical work, shall be made by the Contractor at no additional cost.

F. Air-source VRF system shall be designed specifically for cold weather heating performance.

G. Bidding "over-sized" systems (providing outdoor units with greater nominal tonnage than the basis of design) to meet system cooling and heating requirements is permissible on a voluntary alternate basis only and bid must be accompanied by equipment PLR curves and project energy analysis (completed with Trace 700 or EnergyPro) quantifying energy penalty resulting from associated cycling of over-sized system during mild ambient temperatures.

H. To ensure owner comfort, each indoor unit or group of indoor units shall be independently controlled and capable of changing mode automatically when zone temperature strays 1.8 degrees F from set point for ten minutes.

I. Provide wind baffles on the outdoor compressor unit for cold weather heating.

2.5. **Heat Pump Outdoor Unit.** The outdoor unit modules shall be air-cooled, direct expansion, single-zone unit for the electrical room and multi-zone unit used specifically with VRF components described in this section and herein under Controls for the Operator Level and Machinery Room. The outdoor unit modules shall be equipped with a single compressor which is inverter-driven and multiple circuit boards—all of which must be manufactured by the branded VRF manufacturer. Outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.

A. Outdoor unit systems may be comprised of multiple modules with differing capacity if a brand other than basis of design is proposed. All units requiring a factory supplied twinning kits shall be piped together in the field, without the need for equalizing line(s).

B. Outdoor unit shall have a sound rating no higher than 68 dB(A) individually or 70 dB(A) twinned.

C. Refrigerant lines from the outdoor unit to the indoor units shall be insulated in accordance with the installation manual.

D. The outdoor unit shall have an accumulator with refrigerant level sensors and controls. Units shall actively control liquid level in the accumulator via Linear Expansion Valves (LEV) from the heat exchanger.

E. The outdoor unit shall have a high-pressure safety switch, over-current protection, crankcase heater and DC bus protection.

F. VRF system shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs.

G. The outdoor unit shall be capable of operating in heating mode down to -20F ambient temperatures or cooling mode down to 30F ambient temperatures, without additional low

ambient controls.

H. The outdoor unit shall be provided with a 20-gauge stainless-steel snow /hail guard. The snow/hail guard protects the outdoor coil surfaces from hail damage and snow build-up.

I. The casing shall be fabricated of galvanized steel, bonderized and finished.

J. Outdoor unit components shall be coated with the Seacoast Protection Coating (Brine Spray – BS coating) to protect components from premature corrosion due to a seacoast environment. Coating shall be applied to components before original outdoor unit assembly to ensure manufacturer quality standards are not compromised

2.6. **Heat Pump Indoor Units.** Each unit shall perform in accordance to the ratings shown in Plans. Performance shall be based on indoor 67° F wet bulb, outdoor 95° F dry bulb for cooling and for heating indoor 70°F dry bulb, outdoor 43°F wet bult.

A. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. Indoor unit and refrigerant pipes will be charged with dehydrated air before shipment from the factory.

B. The evaporator fan shall be an assembly with one or two Sirocco fan(s) direct driven by a single motor.

C. The fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings.

D. The evaporator coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phoscopper or silver alloy. The coils shall be pressure tested at the factory. A condensate pan and drain shall be provided under the coil. The condensate shall be gravity drained from the fan coil. Both refrigerant lines to each indoor unit shall be insulated.

E. The unit electrical power shall be 208volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 254 volts

2.7. **Unit Heaters.** Provide electric heaters tested and rated in accordance with the Standard Test Codes of the Air Moving and Conditioning Association, Inc. (AMCA) and bearing their seal and the seal of UL.

A. Provide heaters from same manufacturer to simplify maintenance equipment and procedures.

B. Provide units which utilize electric heating coils for total heating, with electric coils interlocked with the fan motor switch. Electric heat shall be possible only when the fan is in operation. Design such that a minimum number of elements are energized on low or medium fan speeds and additional elements as required will be energized upon demand at high-speed operation. Provide the necessary magnetic contactors and high temperature interlocks with the factory wired units.

1. Casings: Bonderized and painted with a primer and finished with baked-on-enamel at the factory; all parts heavily braced and stiffened to prevent vibration and hold all working parts rigidly in line, horizontal and vertical vanes arranged to give uniform air distribution without objectionable drafts.

2. Fans: Aluminum bladed, direct connected to the fan motor, dynamically balanced.

3. Motors: Totally enclosed continuous fan-duty with built-in thermal overload protection.

4. Electric Heating Element: Metal sheathed fin tube elements each wired to built-in line voltage automatic reset thermal overheat protection.

C. Types

1. Self-Contained Cabinet Type: Provide centrifugal fan cabinet type with multi-speed fan control and built-in thermostatic control, complete with insulation, filters and removable grill panels. Include 24-volt relay with transformer for low voltage remote thermostat.

2.8. **Exhaust Fans.** Provide a 4-inch ducted exhaust fan for restroom with backdraft damper and LED light panel grille. Refer to the Plans for requirements.

A. Aluminum construction fan units, complete with motors, drive equipment and vibration isolation support, with air capacities not less than indicated in the Plans. Provide impeller wheels of airfoil type with backward curved blades, heavily and rigidly constructed, accurately balanced both statically and dynamically, and free from objectionable vibration or noise.

2.9. **Room Thermostats.** Provide thermostats for each space consisting of the Operator Level, Machinery Room, and Electrical Room. For the Operator Level provide two additional hand-held wireless controllers for the thermostat. For the Machinery Room, provide a dedicated thermostat for unit heater.

A. ENERGY STAR certified.

B. Features:

1. 7 day programming with 4 program periods per day.

2. Wi-Fi enabled for remote access

3. Touch panel backlit LCD, occupancy sensor, sensitivity level adjustable, test mode for vacancy and occupancy, temperature sensor, humidity sensor, energy-save control options with occupancy sensor.

4. Operation Modes:

a. Heat Pump: Heat, Cool, Drying, Fan, Auto (Dual and Single Set point).

b. Unit Heater: Heat, Fan, Auto

5. Set Temperature: 40° F to 95° F.

C. For electric resistance unit heaters provide factory compatible thermostat. Thermostat shall be 24-volt electronic, programmable, pulse indication, tamperproof, and digital thermometer.

2.10. Controls.

A. Conditioning of the Electrical Room shall be independent of the other spaces in the control house. Conditioning shall allow for cooling the Electrical Room while heating the other spaces.

B. Control wiring shall be installed in a daisy chain configuration from indoor unit to indoor unit then to outdoor unit. Control wiring shall run from the indoor unit terminal block to the controller associated with that unit.

C. Wiring shall be 2 conductor 18ga. stranded wire with a shield. The wire shall be shielded and connected to the appropriate terminals within the indoor units and outdoor unit.

D. The restroom exhaust fan shall turn on and off with the light switch.

2.11. **Disconnect Switch.** The outdoor unit disconnect switch shall be an Unfused safety switch, for use as disconnects. The switch shall be non-fusible, heavy-duty, safety switches in watertight and dust-tight NEMA 4X, stainless-steel enclosures. The disconnect shall be furnished with two N.O. auxiliary contacts and phenolic nameplate to which reads "OUTDOOR UNIT DISCONNECT SWITCH".

2.12. Ductwork And Accessories. Duct construction detail and metal gauges shall conform to SMACNA, Low Velocity Duct Construction Standards, referred to herein as the Duct Manual, except where necessary to increase gauges and supports for structural strength or other particular needs. Provide electrical isolation between dissimilar metals.

A. Construct round ducts of stainless steel AISI type 304 in accordance with Duct Manual without turning vanes. Provide long radius sectional type elbows unless otherwise accepted.

B. Provide flexible coupling at points where ductwork connects to equipment.

C. Use stainless steel AISI type 304 hangers and construct supporting system in accordance with Duct Manual. For exposed station platform area ducts use strap hangers and round off ends of exposed straps.

D. Provide blades for splitter, butterfly, and opposed blade dampers of the same metal as the ductwork and casings, except two gauge numbers heavier. Provide necessary ductwork accessories for fastening dampers to ductwork. Additionally, provide dampers having accessible operating mechanisms.

E. Provide factory fabricated back draft dampers of the counter-balanced automatic construction. Blade linkage shall be located outside the air stream and shall be of stainless steel. Axles shall be 3/16 inch diameter rod stainless steel. Bearings shall be oil impregnated bronze. Provide blades with felt cushions to insure adequate sealing.

F. Ducts with inlets or outlets to the atmosphere shall have a stainless-steel insect screen and rain hood installed, or as detailed in the Architectural Plans.

3.0 CONSTRUCTION DETAILS

3.1. **Submittals.** Shop and working drawings, erection drawings, catalog cut and specification sheets, final record drawings, removal and installation procedures, test procedures and results, operating, maintenance manuals, and other submittals specified herein are required as part of this work.

A. Submit for review site field measurements report and drawings to document existing dimensions and locations of all interface points between existing surfaces. Indicate field verified dimensions shown on Working Drawings.

B. Submit for review prior to starting the Work for which it pertains the manufacturer's product data and/or Shop Drawings prepared and submitted for all manufactured and purchased items as follows:

1. Catalog cuts of manufactured purchased components are to include certified prints produced by the manufacturer based on the current data, sizes, dimensions, and features of the component to be purchased.

C. Work Procedure: Detailed list of the work and test procedures to be followed.

D. Test Reports: All measurements after field adjusting and testing.

E. Manufacturers' warranties or guaranties for all equipment, and warranty by Contractor for installation and operation of all equipment. All warranties and guaranties shall be submitted in writing and assigned to the Department.

3.2. **General Requirements.** Submittals shall provide complete details, classification of materials, schedules for fabrication, shop assembly procedures, and diagrams showing sequence and details for erection. All submittals shall be subject to review and comment by the Engineer. Submittals that do not meet the minimum requirements identified below will be considered non-responsive and will be returned without review. Submittals that have not been approved or require correction shall be resubmitted until such time as they are acceptable to the Engineer, and such procedure shall not be considered caused for delay. The Contractor shall bear all costs for damages which may result from ordering or fabrication of any materials prior to acceptance of Shop Drawings. The Contractor may request in writing from the Engineer approval to order raw materials of the correct type for later fabrication from approved Shop Drawings after they have been accepted. Such approval by the Engineer shall be in writing.

A. Any deviations from the work depicted on the Contract Plans or alterations proposed by the Contractor which affect the integrity or capacity of the equipment shall be detailed in drawing submittal(s) with accompanying calculations which shall be signed and sealed by a licensed Professional Engineer. Acceptance of the proposed deviations shall be at the discretion of the Engineer of Record.

B. All submittals shall be sequentially numbered. Resubmittals shall be numbered with original submittal number and an alphabetic suffix. Submittals shall be in Portable Data Format (PDF). All shop drawings generated in computer-aided design and drafting software (CADD) shall be submitted as an original PDF generated from the CADD software package. All catalog cuts and other documents shall be text searchable PDF documents when possible. Scanned catalog cuts and other documents shall be scanned using 300 dpi resolution, and in 8-bit up to 24- bit color.

3.3. **Submittal Schedule.** The Contractor shall provide a detailed submittal schedule to the Department within 30 days of the "Notice of Contract Award". The schedule shall address material submittals, shop drawing submittals, disassembly, demolition, assembly and installation procedure submittals, maintenance manual submittals, and any other required information.

3.4. **Dimensional Verification.** Dimensions indicated on the Contract Plans are nominal and intended for information. The Contractor must coordinate the interface of the mechanical systems with the structure and verify all dimensions in the preparation of the shop, assembly and erection drawings.

3.5. **Certified Drawings.** The Contractor shall submit certified drawings for all manufactured products for approval prior to purchase and utilize the certified dimensions in the preparation of the shop and erection drawings. The certified drawing shall be submitted in

support of the shop drawings. The Contractor shall notify the Engineer of Record of any dimensional deviations from the Contract Plans.

3.6. Installation.

A. Installation work shall include all receiving, storing, removing from storage, rigging, uncrating, setting, assembling, and aligning necessary to prepare each item of equipment and its integral parts for normal continuous operation. Installation includes assembly and erection of equipment, specialties, controls, instruments, and all other accessories furnished by the manufacturer with his equipment. Installation includes initial startup of all equipment, and initial testing of the complete heating, ventilating and air conditioning systems as indicated.

B. Install equipment in accordance with manufacturer's instructions. Use stainless steel type 316 bolts or anchors capable of supporting at least three times the weight of the equipment and include vibration isolators.

C. Equipment shall be grounded and bonded together. The outdoor unit disconnect switch shall installed in site of the outdoor unit. All wiring and conduit shall be furnished and installed under the item "Electrical Work".

D. Install equipment and piping systems in accordance with the manufacturer's recommendation and as indicated.

E. Heating and Air Conditioning

1. Install the heating and air conditioning system-complete and ready for operation, as indicated.

2. Install each self-contained air conditioning unit with all connections for heating and cooling sections, fan, and outdoor air damper, in accordance with manufacturer's instructions. Install the factory pre-wired, motorized control valve as indicated.

3. Install each fan-coil unit with all supply and return connections and an automatic air vent on each return. Connect drain to drain outdoors or as indicated.

4. Install each air-handling or heat pump indoor unit in accordance with manufacturer's instructions. Motor starter and disconnect will be furnished and installed under another Section, except as indicated.

F. Refrigeration System

1. Install the refrigeration system complete with all piping, valves, accessories, and insulation. Seal all wall and ceiling penetrations and add insulation at all tube or pipe fittings.

2. Mitering of piping to form elbows, notching straight runs to form tees, or any similar construction will not be permitted.

3. Refrigeration piping shall be tested, dehydrated, and charged before insulating. Test the piping using a test pressure of 150% of service pressure.

3.7. Piping Supports.

A. Supported insulated pipes with stainless steel type 304 half round protective shields.

B. Arrange piping to allow normal inspection and servicing of equipment. Install valves and

specialties in accessible locations to allow for servicing and inspection. Provide adequate clearance between pipe and adjacent walls and hanger, or between pipes for insulation installation.

C. Install piping systems with approved stainless-steel type 304 hangers and supports with dielectric isolators between the pipe and the support. Install pipe hangers and supports to allow for expansion, contraction, and drainage of piping. Place hangers and supports close to valves, vertical riser drops, heavy equipment, specialties, and each piping change of direction.

D. Install traps and double risers as required to entrain oil in vertical runs.

E. Install piping at right angles or parallel to building walls. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.

F. Conceal all pipe installations in walls, pipe chases, utility spaces, or above ceilings.

G. Exterior Wall Penetrations: Seal pipe penetrations through exterior walls using sleeves and mechanical sleeve seals. Use synthetic rubber seals, waterproof material. Where pipes pass through fire-rated walls, partitions, ceilings, and floors, maintain the fire-rated integrity.

H. Install strainers immediately ahead of each expansion valve, solenoid valve, hot gas bypass valve, compressor suction valve, and as required to protect refrigerant piping system components.

I. Install filter/drier with moisture indicator in liquid line before expansion valve.

J. Install unions at connections to compressors and evaporators.

K. Install flexible connectors at the inlet and discharge connection of compressors.

3.8. **Tests.** Upon completion and prior to acceptance of the installation, test all systems as may be required by the Engineer to demonstrate satisfactory functional and operating efficiency. Operating tests shall cover a period of not less than six hours for each system, and all tests shall be conducted at such time as the Engineer may approve. Provide all instruments, facilities and labor required to properly conduct the tests.

4.0 METHOD OF MEASUREMENT

4.1. This work will not be measured for payment. This work shall be at the Contract lump sum price for the completion of all work specified.

5.0 BASIS OF PAYMENT

5.1. The work will be paid for at the contract lump sum price for each item, which shall include all materials, equipment, and labor necessary to complete the work as identified on the plans and as noted herein.

5.2. Final payment will not be made until all the project closeout data submittals have been completed, and the work has been tested and functions to the satisfaction of the Department.

A. Payments will be paid under:

1. 599.061701 WE – Control House HVAC

ITEM 599.061801WE CONTROL HOUSE PLUMBING

ITEM 599.061802WE COUNTERWEIGHT PIT DEWATERING

1.0 DESCRIPTION

1.1. **Notice of Beginning of Work.** The provisions of §564-1, Structural Steel standard specification for NYSDOT shall apply and is supplemented herein. The Contractor shall give the WCDPW ample notice of the beginning of work at the fabrication area, so that a Department Representative may be on hand for inspection. No material shall be manufactured, or work performed before the WCDPW has been so notified.

1.2. **Governing Standard.** The governing standard for all plumbing work shall be the 2020 Plumbing Code of New York State and the International Plumbing Code 2024.

1.3. **Scope of Work - Control House Plumbing.** Water supply work consists of furnishing and installing new water service meter, valves, piping, and fittings from the existing water service line to new plumbing fixtures for the new restroom and kitchenette. Sanitary drain work consists of furnishing and installing new piping, couplings, connections, pump and basin connected from the new restroom and kitchenette fixtures to a new sanitary service line . Existing sanitary drainage into the counterweight pit shall be removed. The sanitary vent to sidewalk shall be removed and a new vent pipe routed up through the existing building chimney. Refer to Utility Work for buried water service line repairs and new sanitary service line tied into existing sewer main.

1.4. **Scope of Work – Counterweight Pit Dewatering.** Work consists of pumping out all wastewater, sewage, and sludge from the counterweight pit, cleaning out the counterweight pit including the sump well for the new pumps, concrete repairs, furnishing, installing new sump pumps with electrical control panels and switches and plumbing discharge piping.

2.0 MATERIALS

2.1. **General Materials and Workmanship.** All materials shall be new unless otherwise indicated and shall meet the minimum requirements of the standards indicated on the Contract Plans and as specified herein. All materials shall be supplied by approved manufacturers as defined herein.

2.2. **Substitutions.** Items specified by manufacturer name or part number on the Contract Plans may be replaced by an equivalent item by another manufacturer, subject to approval by the Engineer of Record that satisfy all listed requirements. All changes required by the substitution shall be made by the Contractor at no additional cost to the Department. Item equivalency shall be determined at the sole discretion of the Engineer of Record and may be based on one or more of the following: quality, function, ease of maintenance, physical size, reliability, value, rating, durability, availability and other criteria as deemed appropriate by the Engineer of Record.

A. The terms "approved equal", "of equal quality" and "or equal" which may appear on the Plans and in these Specifications are intended to allow the Contractor to submit for review other manufacturers and model numbers of products of equal quality and rating for those specified.

B. Prior to the Contractor's ordering of any substitute product, the Engineer's acceptance of the equivalence of the substitute product shall be obtained in writing. The acceptance of the substitute products is at the sole discretion of the Department who will establish the basis for equivalence and will review the quality of the materials and products described in detail on the submitted Shop Drawings and product data.

C. Acceptance by the Department of any substitute products submitted by the Contractor shall not relieve the Contractor of responsibility for the proper operation, performance, or functioning of that product.

D. Where a product is specified by a manufacturer's name and catalog or part number in this Specification or on the Plans, it is so specified to establish quality, configuration, and arrangement of parts. An equivalent product made by another manufacturer may be submitted for review for the specified product subject to the acceptance of the Department; however, all necessary changes required by the substitution in related structural, architectural and electrical parts, shall be made by the Contractor at no additional cost.

2.3. Piping and Fittings

A. Water piping inside the control house to existing service pipe:

1. Pipe: ASTM B88, Type L, hard copper tubing.
2. Fittings: ANSI B16.18 cast bronze solder fittings, or ANSI B16.22 wrought copper solder fitting and couplings.
3. Joints: In accordance with IPC 2024, 605.12. Joints shall be solder except for threaded joints to fixtures.

B. Sanitary drain and vent piping to gravity drain sewer branch:

1. Pipe and Fittings: Ductile cast iron (no hub) per CISPI 301, ASTM A888. Piping shall be coated with organic zinc rich epoxy primer and final paint coat of polyurethane compatible with primer.
2. Joints: In accordance with IPC 2024, 705.3. Use mechanical joint elastomeric sleeve and shield couplings. Steel hardware and shields shall be hot dip galvanized.

C. Counterweight Pit Dewatering; ASTM D3350 HDPE (high density polyethylene) PE 4710 resin. Piping size standard diameter ratio DR 15.5 and ASTM F714. Piping and fitting joints shall be butt fusion joints as per ASTM F2620 and HDPE fittings as per ASTM D3261 or ASTM F2206.

2.4. Pipe Supports

A. Hangers for copper pipe shall be copper material.

B. Hanger threaded rods shall be AISI type 316 stainless steel. Threads Class 2A and nuts Class 2B in accordance with ASME/ ANSI B1.1.

C. Structural angles and channels for hangers shall be hot dipped galvanized steel.

D. Hangers for insulated pipe shall be oversized to accommodate insulation, protection shields, and/or saddles. Insulation shall be protected at supported with 18 gage thick and 6-inch length type 316 stainless-steel shield.

E. Supports for counterweight dewatering pipe shall be stainless-steel AISI type 304: structural shapes or angles, U-bolts, nuts, and washers.

F. Pipe support concrete anchors are a minimum of 3/8" diameter. Use either epoxy 3-1/2" minimum embedment or mechanical double expansion wedge anchors. Use stainless steel anchor rod meeting ASTM F593 (AISI 316) Condition CW, and stainless-steel nuts meeting ASTM F594 (AISI 316) Condition CW. Washers to meet ASME B18.22.1 Type A

Plain and stainless-steel material AISI 316.

G. Use stainless-steel ASTM F593, alloy 316 bolts, nut and washers for supports.

2.5. **Pipe Insulation, Sleeves, and Sealants**

A. 1-1/2-inch-thick insulation with heat trace against pipe and protective jacket on pipe outside of conditioned space.

B. Sleeve all piping passing through walls, floors, roofs, and foundations sufficient to allow free movement of piping.

C. Use UL Listed sleeves at fire-rated and smoke-rated construction. Sleeve shall be hot-dipped galvanized steel.

D. Insulate between the sleeve and pipe with minimum 1-inch-thick calcium silicate in the annular space between the pipe and sleeve. Seal annular space with sealant.

E. For exterior and foundation walls: Use synthetic rubber seals, waterproof material.

2.6. **Wastewater Ejector Pump**

A. The pump system shall consist of but not be limited to; a submersible pump/motor assembly, automatic liquid level control, and all accessories required by the manufacturer to furnish and install a working pump system as specified. Pump to be installed within an integral basin.

B. Pump shall be submersible type, semi open type impeller and accurately machined to the proper diameter. It shall be of heavy-duty mechanical construction, and stainless-steel shaft.

C. Pump shall include a grinder assembly located on the suction side of the pump impeller. The cutter and shredding ring assembly macerates solids into slurry and discharges to the pump impeller. The cutter and shredding ring shall be made hardened corrosion resistant steel.

D. Pump to have curve characteristics so as not to overload the motor at any point throughout its entire range.

E. Pump motor shall be housed in a watertight motor shell with pre-lubricated double seal bearings.

2.7. **Electric Water Heaters**. UL listed, with minimum storage, heat input, and heat recovery capacities indicated. Provide with magnesium anodes and cold water drop tubes.

A. Heater Tanks: Steel, constructed per ASME Code, glass-lined. Minimum working pressure 125 psig. Hydrostatically tested to 300 psig.

B. Jacket: Factory enameled steel with insulation between tank and jacket.

C. Heating Elements: Immersion type or strap-on type, which can be easily removed without draining tank.

D. Controls: Sensitive, close tolerance, immersion type control thermostat. Provide modulating step control actuating magnetic contactors. Furnish with heater prewired to solderless terminal lugs in control panel mounted on vessel.

E. Relief Valves: On each heater, install ASME labeled, Massachusetts approved, and BTU rated temperature and pressure relief valves sized for maximum heat input to heater.

2.8. **Dewatering Pump**

A. Pumps shall be standard submersible models from one manufacturer, with the following

parameters:

1. Quantity: 2
2. Capacity: Refer to the equipment schedule in the Plans.
3. Discharge connection size 4 inch
4. Corrosion resistant
5. Recessed Impeller

B. Provide discharge high pressure hose and fittings with pump. Hose requirements: 100% polyester circular woven reinforcement, three-ply double vulcanized permanently bonded cross-section, weather, and ozone resistant, resistant to salt water. Hose minimum working pressure is 240 psi.

C. Three phase, 460 volts, 60 hz. Portable semi-permanent installation.

D. Wear ring to be bronze alloy UNS No. C92400.

E. The impeller shall be semi-open, non-clog, with ejector (pump out) vanes on the top of the impeller, and dynamically balanced. Shaft shall be stainless steel.

F. The casing shall be ASTM A48 class 35B gray cast iron in accordance with current revision of the Hydraulic Institute standards. Both inner and outer surfaces of casing shall be painted with thermo-setting acrylic baked enamel.

G. The motor shall be rated for continuous duty and capacitor start design. The stator winding shall be open type with class F insulation suitable for operation in clean dielectric oil. The motor shall be provided with ball-type anti-friction bearings. The ball bearings shall be designed for a B-10 life of 30,000 hours minimum. The motor shall be designed and tested to withstand an 18-day locked-rotor operation without damage. The motor shall be protected by two independent sets of mechanical shaft seals mounted in tandem on the pump shaft and tensioned by a spring constructed of stainless steel and buna-n elastomers. Inner and outer mechanical seals to be corrosion resistant cemented carbide.

H. The power cable shall be sealed at the motor end as it enters the motor casing by a two-part barrier to moisture intrusion. The barrier shall be the compression of the oil and chemical resistant grommet which shall seal the outer jacket of the power cord. The outer jacket of the power cord shall be oil resistant and water resistant. The power cable shall be rated for NEC severe service "S", type STOW.

I. Include control panels for each pump with operation controls in accordance with the Electrical Work.

2.9. **Float Switches**. Mechanically activated float switches, snap-action, sealed gold cross-point contacts to activate low current control panels and alarms. Not sensitive to rotation. UL Listed for use in non-potable water and sewage.

A. Narrow angle Control for Low Voltage AC or DC applications.

1. 125 VAC – Max. Load .1 amps (Min. Load 0.16 milliamps)
2. 30 VDC – Max. Load .1 amps (Min. Load .16 milliamps)
3. 5 VDC - Minimum Load 1 milliamp

B. Maximum submergence or water depth, 30' (9 meters), 13 psi.

C. Flexible 18-gauge, 2 conductor SJOW water resistant cable.

D. Impact and corrosion resistant polypropylene float housing.

E. Include stainless steel AISI type 304 mounting clamp for each switch.

F. Provide (2) spare float switches.

2.10. Oil Sensor. Capacitive sensor factory-calibrated for immediate operation to differentiate between oil and water. Include NEMA 4X control panel. The sensor is for 480 volt, 3 phase power. Sensor shall be solid-state and factory-tested including:

A. NEMA 6P and stainless steel type 316 sensor enclosure.

B. Anti Condensation Heater

C. Power on Dry Contact

D. Adjustable alarm indication depth and alarm flasher.

E. Disconnect Switch

3.0 CONSTRUCTION DETAILS

3.1. **Submittals.** Shop and working drawings, erection drawings, catalog cut and specification sheets, final record drawings, removal and installation procedures, test procedures and results, operating, maintenance manuals, and other submittals specified herein are required as part of this work.

A. Submit for review existing dimensions and locations of plumbing piping. Indicate and provide these field verified dimensions on Working Drawings.

B. Submit for review prior to starting the Work for which it pertains the manufacturer's product data., Working Drawings and/or Shop Drawings prepared and submitted for all manufactured and purchased items as follows:

1. Catalog cuts of manufactured purchased components are to include certified prints produced by the manufacturer based on the current data, sizes, dimensions and features of the component to be purchased.

C. Work Procedure: Detailed list of the work and test procedures to be followed.

D. Test Reports: All measurements after field adjusting and testing.

E. Manufacturers' warranties or guaranties for all equipment, and warranty by Contractor for installation and operation of all equipment. All warranties and guaranties shall be submitted in writing and assigned to the Department.

3.2. **General Requirements.** Submittals shall provide complete details, classification of materials, schedules for fabrication, and field assembly procedures. All submittals shall be subject to review and comment by the Engineer. Submittals that do not meet the minimum requirements identified below will be considered non-responsive and will be returned without review. Submittals that have not been approved or require correction shall be resubmitted until such time as they are acceptable to the Engineer, and such procedure shall not be considered caused for delay. The Contractor shall bear all costs for damages which may result from ordering or fabrication of any materials prior to acceptance of Shop Drawings.

A. Any deviations from the work depicted on the Contract Plans or alterations proposed by the Contractor which affect the integrity or capacity of the equipment shall be detailed in drawing submittal(s) with accompanying calculations which shall be signed and sealed by a licensed Professional Engineer. Acceptance of the proposed deviations shall be at the discretion of the Engineer of Record.

B. All submittals shall be sequentially numbered. Resubmittals shall be numbered with the original submittal number and an alphabetic suffix. Submittals shall be in Portable Data Format (PDF). All shop drawings generated in computer-aided design and drafting software (CADD) shall be submitted as an original PDF generated from the CADD software package. All catalog cuts and other documents shall be text searchable PDF documents when possible. Scanned catalog cuts and other documents shall be scanned using 300 dpi resolution, and in 8-bit up to 24- bit color.

3.3. **Submittal Schedule.** The Contractor shall provide a detailed submittal schedule to the Department within 30 days of the "Notice of Contract Award". The schedule shall address material submittals, shop drawing submittals, disassembly, demolition, assembly and installation procedure submittals, maintenance manual submittals, and any other required information.

3.4. **Dimensional Verification.** Dimensions indicated on the Contract Plans are nominal and intended for information. The Contractor must coordinate the interface of the mechanical systems with the structure, electrical, and architectural work, and verify all dimensions in the preparation of the shop, assembly, and erection drawings.

3.5. **Certified Drawings.** The Contractor shall submit certified drawings for all manufactured products for approval prior to purchase and utilize the certified dimensions in the preparation of the shop and erection drawings. The certified drawing shall be submitted in support of the shop drawings. The Contractor shall notify the Engineer of Record of any dimensional deviations from the Contract Plans.

3.6. **Installation.** Install piping systems with approved hangers and supports to prevent sagging, warping and vibration of piping systems. Install pipe hangers and supports to allow for expansion, contraction, and drainage of piping. Place hangers and supports close to valves, vertical riser drops, heavy equipment, specialties, and each piping change of direction.

A. Provide all concrete inserts and structural members required for the proper support of the piping systems with proper approved distribution of weight. Support in all directions the weight of the pipe and three times its water volume weight.

B. Do not weld to or cut structural steel.

C. Run pipe as directly as possible, avoiding unnecessary offsets and interferences, maintaining maximum headroom, and concealed in all rooms or areas, except mechanical equipment rooms, unless otherwise noted. Coordinate exact locations of mains, risers, and cleanouts in the field.

D. Arrange pipelines to give ample room for pipe insulation. Run piping parallel to or at right angles with the lines of the building.

E. HDPE fusion joints shall be made in accordance with ASTM F2620 by a qualified technician using butt fusion machine. Visually examine fusion joints for bead uniformity, and no defects such as cracks, incomplete fusing, and misaligned joints. Record fusion data for each joint.

F. Allow for thermal expansion over a range of 100 degrees Fahrenheit. Space supports every 4 feet unless shown otherwise on Plans.

G. Use stainless steel AISI type 316 mounting brackets, angles, plates, and hardware for supporting piping, switches, pumps, and panels. Use minimum 1/4-inch thick shapes and plates.

3.7. **Counterweight Pit Cleanup and Repair**

A. Dispose of all waste and removed materials properly in accordance with authority having jurisdiction adhering to all governing laws in accordance with Contract Item

B. Pump-out all water, sewage, and sludge from the counterweight pit.

C. Remove and dispose all debris, sand, broken concrete, spare balance plates or blocks, existing pumps, pipes, all abandoned electrical equipment, and other abandoned materials.

D. Power steam clean all counterweight pit surfaces including walls, floor, bumpers, and the sump well for the pump. Collect, pump-out, and dispose of all leaning water and materials.

E. Repair concrete cracks and spalls in accordance with Contract Item for concrete crack repairs, and Item for concrete spalls.

3.8. **Sump Pump.** Clean out all debris, sand, oil, and waste from the existing sump at the bottom of the counterweight pit floor. Secure the new sump pumps with a new stainless-steel wire anchored to the pier wall. The pumps in the pit shall be controlled from its corresponding panel.

A. The primary pump is controlled with high and low float switches and an auto shut-off with an alarm from oil sensor. This pump shall have an auto run mode or manual run mode. The pump shall be shut down and the alarm in the oil sensor panel activated if oil is detected near the top of the sump. Field test the pump such that the pump shuts off before water churning occurs. Several inches of water may remain in the counterweight pit to avoid water churning.

B. The secondary pump has a dedicated panel with manual run switch that is only enabled to run if its dedicated oil sensor detects water. If the oil sensor detects oil the alarm sounds and pump is shut down. Its oil sensor shall be mounted 6 to 12 inches above the top of the pump.

3.9. **Cleaning and Painting**

A. Paint new and existing steel at interface with supports and equipment in accordance with specifications for coating and painting structural steel.

B. Surfaces shall be cleaned with final surface preparation, prior to painting, done by solvent hand tools, or power tool cleaning to meet the requirements of SSPC- SP 1, 2, or 3 with the following exceptions:

C. After proper surface preparation, surfaces shall be coated as per the manufacturer's temperature and humidity requirements for application. Surfaces for fit-up with other components to have one primer coat.

D. All nameplates, legend plates, and escutcheons mounted on machinery shall be masked for protection from paint. Lubrication fittings shall be kept clog-free.

3.10. **Testing.** Test run each pump assembly by flooding the counterweight pit with water. Time the outflow of effluent discharge in seconds until pump shuts off triggered by float switch. Measure the water height in the pit when pump turns on and off triggered by respective float switches.

3.11. **Coatings**. The threads of all mounting bolts shall be coated with anti-seize compound before assembly of the nuts to prevent corrosion or galling and to facilitate future removal if necessary.

A. For general sealing against water intrusion use Permatex Ultra-Blue RTV sealant for oily surfaces. For sealing pipe threads use Permatex Seal + Lock Thread Compound during assembly. For sealing inspection covers use Permatex Ultra Rubber Gasket Sealant and Dressing or approved equal.

B. For screw in tapped holes use permanent assembly thread locker coating on threads. Accepted products but not limited to:

1. Permatex Threadlocker Blue
2. Loctite Threadlocker Blue 242

3.12. **Defective Or Damaged Work**. Replace or repair damaged or defective work at no additional cost to the Department. Retest required work and obtain acceptance of the Engineer prior to system use. Repeat water system sterilization whenever original clean status is voided.

3.13. **Adjusting and Cleaning**

A. Clean fixtures and trim just prior to acceptance.

B. Clean out strainers and aerators.

C. Adjust and replace washers to prevent leaks at faucets and stops, as required.

D. Adjust pressure at drinking fountains to provide proper flow stream.

E. Adjust temperature and pressure of hot water system, and balance system.

3.14. **Maintenance Manuals.** Submit manufacturer's maintenance manuals for all installed equipment. Include lists of replacements parts and lubricants. Include maintenance schedule.

4.0 METHOD OF MEASUREMENT

4.0. The plumbing work shall be measured as Lump Sum separated for each plumbing item.

4.1. Counterweight pit dewatering of contaminated fluids shall be measured as a separate lump sum under Item 205.97200011.

4.2. Work to repair the concrete of the counterweight pit to be measured as LF (linear feet) of crack length repaired under Item 555.80020001.

4.3. Work to remove and patch concrete spalls of the counterweight pit to be measured as CY (cubic yards) of removed and replaced concrete under Item 582.05.

5.0 BASIS OF PAYMENT

5.1. The plumbing work will be paid for at the contract lump sum price for each item, which shall include all materials, equipment, and labor necessary to complete the work as identified on the plans and as noted herein. Electrical panels for the dewatering pumps are incidental to payment herein.

5.2. Counterweight pit cleanup and repair to be paid under each Item associated with the Work for cleanup, repair, and patching respectively.

5.3. Final payment will not be made until all the project closeout data submittals have been completed, and the work has been tested and functions to the satisfaction of the Department.

A. Payments will be paid under:

1. 205.97200011 – Testing, Handling and Disposal of Contaminated Dewatering Fluids
2. 555.80020001 - Crack Repair by Epoxy Injection (Restoration)
3. 582.05 - Removal of Structural Concrete - Replacement with Class A Concrete
4. 599.061801WE – Control House Plumbing
5. 599.061802WE – Counterweight Pit Dewatering

ITEM 599.063000WE BRIDGE ELECTRICAL AND CONTROL SYSTEM

DESCRIPTION

This specification covers the fabrication and installation of the bridge power, control, and electrical machinery for the Glen Island Bridge as well as the removal and lawful disposal of the material/devices being replaced.

Conformance
Electrical equipment and its installation shall conform to the requirements of the latest revision of the American Association of State Highway Transportation Officials (AASHTO), except as may be otherwise provided herein. In addition, it shall conform to the requirements of the current National Electrical Code (NEC), National Electrical Manufacturer's Association (NEMA), Underwriters Laboratory (UL), Institute of Electrical and Electronics Engineers (IEEE) and to any applicable local rules and ordinances.

Obtain any required permits and approvals of all Departments or Agencies having jurisdiction.

Scope of Work
The work covered by this Item consists of furnishing, installing, and placing in satisfactory operating condition the complete electrical systems for permanent operation of the bridge and auxiliaries as indicated on the Plans, called for in these Specifications, or as required for complete pieces of work. The major pieces of equipment or systems covered include, but are not limited to, the span drive motors and brakes, limit switches, programmable logic controller (PLC), power distribution and motor control equipment, navigation lights, span motors, vector motor drives, complete raceway and conductor systems, traffic gates and signals, roadway luminaires, and monitoring equipment. The scope of work will also include the lawful demolition/removal and disposal of the existing equipment that is being replaced/removed.

The cost of removal of existing items, as shown on plans, or if items are replaced as called out in this specification, shall be included in the bid price of this item.

It is the intent and purpose of these Specifications to cover and include all apparatus and appliances to properly install, wire, connect, equip, test, adjust, and put into approved working order the respective portions of the electrical work herein specified. Furnish any incidental apparatus, appliance, material, or labor not herein specifically mentioned or included, but that the Engineer deems necessary to comply with the requirements of the related documents and referenced standards or codes, just as if specifically mentioned in these Specifications and without extra cost.

The alignment and fastening of electrical equipment to be incorporated into the bridge machinery, such as motors, brakes, rotary limit switches, and position encoders, is included under the appropriate machinery item.

Compatibility with Existing EquipmentWork under this item requires connection of new/rehabilitated items to existing components to remain. The Contractor shall perform field visits and verifications necessary to ensure that the materials and methods being proposed will be completely compatible with the existing equipment to remain, and that all original system functions will be returned to operation at the completion of the Contract work.

ITEM 599.063000WE BRIDGE ELECTRICAL AND CONTROL SYSTEM

It is noted that, in certain cases, it may not be possible to locate new components which fully integrate and provide compatible operation with existing equipment/components to remain. In this case, the Contractor may propose alternate methods including replacement/alteration of existing system components that are not shown to be replaced or modified in the Contract Documents. The Contractor shall make a submittal to the Engineer, who shall have the sole discretion regarding approval of the alternate methods. Where approved by the Engineer, the alternate methods shall be considered to be for the Contractor's benefit, and the Contractor shall not receive additional payment for the changes in work performed. Any costs associated with ensuring integration of the proposed work/equipment to existing systems, such that the existing systems are restored to original functionality, shall be borne by the Contractor and included in the bid price of this item.

Working Drawings and Samples
Provide shop drawings and operation and maintenance manuals as specified herein.

Prepare and submit for review working drawings in accordance with the approved project schedule. Provide the following working drawings in accordance with the provisions of the Contract:

- Certified dimension prints of all motors, span brakes, brake wheels, limit switches, and other electrical apparatus external to the control panels.
- Complete schematic wiring diagrams, including all power, control, and lighting connections. Identify electrical devices and each wire between devices by an individual designation of letters, numbers, or a combination of both; and use such designations wherever the devices or wires appear on other drawings. Include a complete set of catalog cuts for materials furnished for review at time of schematic submittal.
- Layout drawings and internal connection diagrams of the control panels.
- A schedule of electrical apparatus which lists each electrical device by its designation as shown on the schematic wiring diagram and states for each device its rating, number of poles or contacts, function, catalog number, and location.
- Complete interconnection diagrams for all electrical apparatus and equipment used in the operation of the spans and their auxiliaries. The diagrams shall be of the point-to-point type and shall show the external connections of all devices and equipment. The control system vendors shop drawings shall include complete drawings of terminal block layouts to allow the contractor to properly develop interconnect drawings. Computer-generated interconnection lists will not be acceptable in lieu of a true interconnection diagram.
- A complete schematic conduit and cable diagram or diagrams showing the interconnection of all devices and equipment, including ducts and junction boxes, and showing all multi conductor cables. Show the size of each conduit, and the wire number of each conductor in multi conductor cables on the diagrams. Suitably number or letter each conduit and multi conductor cable and show percent wire fill. As built the final installed length.
- A complete set of layout and installation drawings for the electrical work showing the location and installation, including support and mounting details, of all electrical apparatus and equipment. Make these drawings to scale and show the exact location of all conduits, cables, wiring ducts, boxes, motors, brakes, limit switches, disconnect switches, and other electrical equipment and the method of supporting them on the structure.
- Outline drawings and mounting details of all navigation lights and air horns.
- Detail drawings showing the construction and mounting details of all wiring troughs and raceways.
- A complete list of all spare parts furnished as part of the Contract.

- Material listing and specifications for programmable controller, including input/output units, programming terminal, and equipment for interfacing.
- The programmable controller program listings in ladder-rung formats. Describe circuit functions; identify all contacts and outputs by word description and by number designation. Number ladder rungs sequentially for reference. Fully document and comment the ladder diagram and identify and list internal ladder logic relay contacts usage in other rungs. Reference inputs and outputs to locations of signals on interconnection diagram. Include a full cross-reference report.
- Any other drawings, which may, in the opinion of the Engineer, be necessary to show the electrical work.

Where specific manufacturers catalog numbers and/or class/type/form are noted on the contract document, these items need not be submitted for review, so long as these exact devices are utilized. For contactors, starters, pilot devices, circuit breakers, disconnect switches and control relays, any NEMA rated device that meets the required ratings from Square D, Allen-Bradley, Siemens, or General Electric may be utilized without submitting for review, save that the Engineer reserves the right to reject as unsuitable, during the shop inspection or in the field, devices or equipment that in his sole opinion do not meet the requirements of the contract documents. Any rejected equipment or device shall be replaced with Engineer approved equipment or device at no additional cost to the County or impact with the construction schedule. In addition, using the pre-approved equipment and material does not relieve the contractor of the requirements to properly integrate this equipment into a complete, fully operational system.

On certified dimension prints of the apparatus, state in the certification the name of the job, the application of the apparatus, device designation, number required, right-hand or left-hand assembly, electrical rating, number of poles or contacts, material, finish, and any other pertinent data to show that the apparatus meets the specified requirements.

Upon completion of the work, correct all electrical shop or working drawings to show the work as constructed and provide one (1) set of Mylar reproducibles. In addition, submit in computerized file form in Adobe Acrobat (pdf) Format all electrical schematics, ladder diagrams, internal ladder logic diagrams, systems documentation, dimension drawings of equipment, and devices submitted by the electrical systems vendor.

Submit for inspection and test, if directed by the Engineer, samples of any apparatus or device, which is proposed for use as a part of the electrical installation.

Instruction Books and Manuals
Furnish to the Engineer seven bound copies and a CD, one of which remains with the Design Consultant Engineer, of an instruction manual with the title "Operation and Maintenance Manual, Volume 1, Operation of Electrical Equipment," containing the following:

- Table of Contents.
- Detailed, technical operating instructions, which cover span operation, manual operation, span operation with PLC disabled, etc.
- Detailed description of all control equipment including instructions to achieve optimum settings of all limit switches, detectors, etc.
- Description of control, which shall describe in full the functions of all protective devices, limit switches, contactors, relays, PLC and associated equipment and all other electrical equipment used, both in the power service and in the control system, in connection with each step in the operating sequence. Use wire and apparatus numbers appearing on the wiring diagrams in this description for identifying the various devices and circuits.

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To augment the description of control and operations, include reference drawings showing locations of equipment. Include a layout of control apparatus in the machinery rooms. Cross-reference all descriptions with reference drawings.

Furnish to the Engineer seven bound copies and a CD, one of which remains with the Design Consulting Engineer, of a book with the title "Operation and Maintenance Manual, Volume 2, Maintenance of Electrical Equipment," containing the following:

- Table of Contents.
- Maintenance instructions for the electrical equipment, including warnings and precautions to be observed during maintenance actions. All preventive maintenance procedures are to be outlined and a chart listing all maintenance procedures in chronological order shall be provided.
- Set of descriptive leaflets, bulletins, maintenance instructions, and drawings covering all approved items of equipment furnished and installed under the item "Bridge Electrical Work."
- A troubleshooting flow chart for troubleshooting the bridge electrical system shall be provided to facilitate the diagnosing and correcting of malfunctions.
- Instructions for diagnosing malfunctions of the programmable control system and for detecting failures in the external controls connected thereto.
- Reduced size prints of working drawings, including all schematic wiring diagrams, control console and control panel layouts and connection diagrams.
- PLC schematic wiring, relay logic, PLC input/output hardwire diagram, PLC logic and PLC ladder diagrams.
- Control console and control panel layouts and wiring diagrams.
- Composite schedule of electrical apparatus.
- Complete spare parts list.
- Test data, equipment, criteria, and performance curves for all span drive motors.
- Conduit layout and installation drawings.
- Names, addresses, and telephone numbers of vendors and suppliers.
- PLC software program and manufacturers manuals for all PLC hardware.

Assemble the material for the operation and maintenance manuals to form a booklet for each volume with heavy plastic covers. Assemble each booklet in a three-ring binder, approximately 229 mm by 305 mm with 76mm "D" rings, with a vinyl cover to allow insertable Title Sheets. Neatly entitle each booklet with a descriptive title, the name of the bridge, the Owner, the location, year of installation, Contractor, and Designer. Include easily legible copies of drawings in black on a white background. Submit the arrangements of the booklets, the method of binding, material to be included, and the text to the Engineer for approval. Complete the final bound volumes of the instruction books and make them available at the bridge site for use during the field-testing period hereinafter specified for the electrical work.

Number and list by section in the Table of Contents all literature and descriptive materials included in any manual.

Separate each section/subsection with tabbed divider sheets. Suitably title each tab. Use 20 pound, 3 hole pre-punched loose leaf paper and reinforced with plastic or cloth tape.

Related Sections
Conform to applicable requirements from the following construction specification sections:

0603631A - Operating Machinery

ITEM 599.063000WE BRIDGE ELECTRICAL AND CONTROL SYSTEM

MATERIALS

Equipment and Material Provisions
Provide all new equipment and materials. Provide equipment, materials, and workmanship that is first-class in every particular and that is manufactured and erected to the satisfaction of the Engineer. Provide a warrantee for the in-service working of the electrical installations for one year following project acceptance. If the Contractor has any objection to any feature of the electrical equipment as designed and laid out, he must state his objection at once in writing to the Engineer, otherwise his objection will be ignored if offered as an excuse for malfunctioning of the equipment or for defective or broken apparatus.

Provide each piece of electrical equipment and apparatus with a corrosion-resisting metal nameplate on which is stamped the name of the manufacturer and the rating or capacity of the equipment or apparatus.

Use corrosion-resisting material such as stainless steel, for all metal parts of the installation, except parts that are specified to be structural steel. Use cast-iron, malleable iron, or steel with a hot-dip galvanized finish where specified herein.

Provide vibration proof mounting hardware, wire, and cable terminals.

Submit for approval as soon as possible details of any departures from the Plans or the Specifications that are deemed necessary by the Contractor, and reasons therefore on. No such departures shall be made nor work started without approval of the Engineer.

Material requirements for specific apparatus, equipment, and materials are found in the articles under the section "Construction Details" in this item.

Bridge Control System Vendor
Use a single, qualified control system vendor for the manufacture and/or furnishing and assembly of all apparatus and equipment comprising the bridge control systems, including, but not limited to, drives, motors, brakes, limit switches, motor controls, control cabinets, special control panels, programmable controllers, interfacing equipment, laptop hardware for local troubleshooting, and other apparatus required to provide a complete functioning system. The vendor shall assemble the control panels and console at an Underwriters Laboratory approved Facility in accordance with UL 508.

The control system vendor is required to have experience in providing electrical control systems for movable bridges of various types, including bascule, vertical-lift, swing bridges, and control systems, including AC vector motor drives and programmable controllers. The control system vendor shall be of a caliber and background similar to that of Panatrol Corp, Burr Ridge, IL, (630) 655-4700, Faith Technologies APC Group, Menaska, WI, (920) 783-1500, Dmytryka Jacobs Engineering, Toledo, OH, (419) 380-4900, or approved equal. Identify a minimum of five movable bridges for which the system vendor has provided complete systems, including solid-state drive motor control and programmable controller logic within the past 10 years.

The following applies to the control system vendor:

- Assume complete system responsibility for the integrated functioning of all components to provide a satisfactory assembled system operating in accordance with specified requirements.
- Assume responsibility for the detailed schematics and fabrication of the total control systems to ensure compatibility of equipment and suitability for the intended system functioning.
- Assume responsibility for developing the program for the Programmable Logic Controller (PLC) based on the performance specification for operation of the bridges.

- Assume responsibility for developing and integrating PanelView operator display and diagnostic screens.
- Provide supervisory assistance in the installation of equipment to ensure maximum reliability and ease of maintenance.
- During testing of the electrical systems, it may be found that deviations from the performance specifications are required for optimum bridge operation. Include all hardware and software required for these modifications in the control system vendor scope of work at no additional cost to the County.
- Provide a field service staff having the capability of providing services for field coordination of construction and final adjustments to the drive system. Upon final acceptance of the bridges, provide on-call warranty service for a period of 1 year. Field staff shall be capable of responding to an emergency within 6 hours.

Provide written certification of compliance with specified requirements for the control system vendor. Include this certification in the bid documents. The certification shall be subject to approval by the Engineer.

Factory Inspection and Testing
The control cabinets and other apparatus fabricated or assembled by the control system vendor shall be subjected to shop inspection to demonstrate compliance with all specified requirements. The inspection is intended as a means of facilitating the work and avoiding errors, and it is expressly understood that it will not relieve the Contractor of responsibility for imperfect material or workmanship.

Assemble and temporarily interconnect for operational testing at the plant of the control system vendor the power and control cabinets and drives with programmable controllers with all required interfacing equipment. Limit switches shall be simulated with temporary switches, and reduced horsepower motors shall be connected to the drives. The testing is intended to demonstrate proper programmed operation of all bridge drives and auxiliary equipment in accordance with specified requirements for system functioning, including the programmable controllers, vector drives, and all control relays and motor starters.

Special testing shall include complete verification, adjustment, and testing of the regulator circuits and equipment using regulator simulators as necessary.

Perform all tests required herein in the presence of the Engineer or his authorized representative. Do not ship any equipment from the factory until it has been released for shipment by the Engineer. Provide notification sufficiently in advance of the date of the tests so that arrangements can be made for the Engineer to be present at the tests.

During the witnessed inspection, the Engineer will check nameplate legends, conductor identifications, instrument scales, escutcheon plate engraving, and all other details of construction for conformity with specified requirements.

Panelboards

Main Distribution Panelboards (MDP)
Main distribution panelboards will conform to the following standards: NEMA PB 1, NFPA 70, UL 50, UL 67.
Main distribution panelboards with main circuit breakers up to 600A will be NEMA 4X Main distribution panelboards with main circuit breakers over 600A will be NEMA 3R rated.
Main distribution panelboards will be rated for 200A minimum and include a main circuit breakers. Bussing will be tin plated. The main distribution panel will be supplied with an internal surge suppression device.

The surge suppression device will be rated for 480/277VAC and will be UL1283 listed. The surge suppression device will be rated for at least 120kA per phase and will have discrete 10 mode circuitry. The surge suppression devices will be encapsulated. The lead wires from the SPD will be kept to a minimum. All MDPs will have a minimum short circuit rating of 65KAIC at 480VAC.

Lighting Panelboards

Each lighting panelboard will be of the dead-front type and will be provided with quick-make, quick-break, thermal-trip, E-frame, branch circuit breakers. Each breaker will trip free of the operating handle, and the handle will indicate the position of the breaker. Each panelboard will be provided with a circuit breaker in the mains and with a full-sized neutral bar. All branch circuits will be numbered, and a typewritten directory will be provided on the inside of each door. Circuit breakers will meet the requirements of UL Standard 489.

All lighting panelboards will be 120/208, 3-phase, 4-wire panels surface or flush mounted as called out on the Plans. Panelboard enclosures will be code gauge galvanized steel with ANSI 61 light gray enamel finish. Panel boards will be NEMA 4X rated, with copper lugs and tin platted copper busses. Panelboards will be approved equal to Siemens P2, Cooper Crouse-Hinds XLPB series or Square-D Type QO.

Span Drive Motors

The span drive motor shall be AC induction type, squirrel cage type, vector duty motor. The motor shall be built in strict accordance with NEMA publication MG 1 and designed for use with Variable Frequency Drive AC closed loop vector controllers. They shall be 3 phase 60 Hertz, with moisture resistance insulation, 120° F temperature rise, and capable of instant reversing. Ratings shall be as follows:

Horsepower: 60 HP
Nominal Voltage: 480 VAC primary
Nominal speed: 1200 RPM
Duty: 60 minutes
Frame size: *
Insulation: H
Service Factor: 1.15

* Frame size shall be coordinated with the motor and drive manufacturer for accuracy

The motor shall be totally enclosed non-ventilated (TENV) construction, with re-greaseable ball bearings, moisture resistant insulation and internal space heater sized by the manufacturer. The space heater shall operate at 120 VAC and mounted in the lower portion of the motor. The motor shall have a special extended shaft as shown on the mechanical contract drawings to accommodate the motor brake and a rear mounted encoder on the other. The motor shaft shall be cadmium plated. A drain hole of not less than ½ inch diameter shall be provided at the bottom of the motor, fitted with a suitable drain plug.

All windings shall be copper. The motor shall be capable of having a minimum breakdown torque of 200% of full load torque. The motor must have a speed range of 1000:1 and be capable of providing full torque at zero speed. Motor design shall be low inertia and slip design. A normally closed temperature sensor shall be embedded in the windings.

Motor encoder shall be an industrial type (glass encoder wheels are not acceptable). The encoder shall have a resolution of minimum 1024 ppr and be compatible with the Variable Frequency Drive vector controls. The encoder shall be 24V DC operated. The encoder shall have dual output differential line driver modules with 24V DC signal. A separate terminal box with terminal strip for feedback unit shall be provided. Encoders shall not be connected or wired through motor junction box. Encoder shall be factory-installed at the plant of the motor manufacturer and approved by both the Engineer and the drive manufacturer. Encoders shall be approved equal to the Avtron Encoders AV850. The motor must comply with NEMA MG1 for dimensions, face runout, and shaft runout. Encoder shall be supplied with the optional outboard

seal plate for through-shaft mounting. The encoder through-shaft projection from the accessory mounting piece shall be coordinated and as recommended by the encoder manufacturer.

The motor box shall be liberally sized and located to avoid interference with the machinery. The conduit boxes shall be sized in accordance with the requirements of the NEMA MG 1 2016 PART
All field wiring brought into motor box shall be terminated on terminal blocks with insulated, ring tongue lugs of the proper size.

The motor shall be designed and manufactured in the United States of America. Span Drive Motors shall be manufactured by ABB Baldor, Marathon Electric, Reuland Electric, WEG Motors, or approved equal.

The motor shall be manufactured to the following standards:

- IEEE Marine Standards No. 45.
- American Bureau of Shipping (A.B.S.).
- U.S. Coast Guard Inspection Service.
- NEMA MG-1

Span drive motor shall also be provided with the following features in order to meet the requirements of these Specifications:

- All aluminum parts chemical film and zinc chromate primer.
- Stainless steel Cadmium plate shaft and hardware (FED QQ P 416).
- Double Sealed ball bearings.
- Seal all joints and eye bolt holes.
- Sealed leads in terminal box.
- Shaft seals.
- Removable drain plugs.
- Final coat of epoxy paint.
- Corrosion resistant coating rotor and stator laminations.
- Stainless steel nameplate with all applicable NEMA MG 1 information.
- Super 'H' insulation including protection against fungus growth.
- NEMA MG-1 Design B
- Motors shall have windings vacuum pressure impregnated three times with severe seacoast or open ocean rated epoxy.

- The motor frame shall be finished with a corrosion resistant paint or coating. Exposed unpainted metal surfaces shall be of a corrosion resistant material.

An in-sight disconnect switch shall be provided within range view of each the motor as specified elsewhere. The 120-volt strip heater in each motor frame shall be wired to the normally open auxiliary contact in the corresponding motor disconnect switch.

Motor must be designed to operate at carrier frequencies up to 30 kHz and designed to be controlled with a flux vector drive. All motors shall be dynamically balanced. The Contractor shall ensure that the span motor is electrically and mechanically compatible with the span drive as approved by the span drive manufacturer.

Squirrel Cage Auxiliary Drive Motor

The span drive auxiliary motor will be an AC induction type, squirrel cage type motor. The motor will be built in strict accordance with NEMA publication MG 1. It will be 3 phase 60 Hertz, with moisture resistance insulation, 120° F temperature rise, and capable of instant reversing. Ratings will be as follows:

- Horsepower: 7.5 HP
- Nominal Voltage: 480 VAC primary
- Nominal speed: 1800 RPM
- Duty: 60 minutes
- Frame size: *
- Insulation: H
- Service Factor: 1.15

* Frame size will be coordinated with the motor manufacturer for accuracy.

The motors will be totally enclosed non-ventilated (TENV) construction, with re-greaseable ball bearings, moisture resistant insulation and internal space heater sized by the manufacturer. The space heater will operate at 120 VAC and be mounted in the lower portion of the motor. The motor will have a special extended shaft as shown on the mechanical contract drawings to accommodate the motor coupling and motor brake on one end. The motor will have a special hexagonal extended shaft as shown on the mechanical contract drawings on the rear of the motor to accommodate a socket drill so that the span could be manually operated in the event of a motor failure. The motor shafts will be cadmium plated. A drain hole of not less than ½ inch diameter will be provided at the bottom of the motor, fitted with a suitable drain plug.

All windings will be copper. The motor will feature a NEMA Design D torque speed curve characteristics and will be capable of having a breakdown torque minimum of 275% of full load torque. A normally closed temperature sensor will be embedded in the windings.

Each motor box will be liberally sized and located to avoid interference with the machinery. The conduit boxes will be sized in accordance with the requirements of the NEMA MG 1 2016 PART 11. All field

wiring brought into motor box will be terminated on terminal blocks with insulated, ring tongue lugs of the proper size.

The motor will be designed and manufactured in the United States of America. Span Drive Motors will be manufactured by ABB Baldor, Marathon Electric, Reuland Electric, WEG Motors, or approved equal.

Auxiliary motor will be manufactured to the following standards:

- IEEE Marine Standards No. 45.
- American Bureau of Shipping (A.B.S.).
- U.S. Coast Guard Inspection Service.
- NEMA MG-1

Auxiliary Span drive motor will also be provided with the following features in order to meet the requirements of these Specifications:

- All aluminum parts chemical film and zinc chromate primer.
- Stainless steel Cadmium plate shaft and hardware (FED QQ P 416).
- Double Sealed ball bearings.
- Seal all joints and eye bolt holes.
- Sealed leads in terminal box.
- Shaft seals.
- Removable drain plugs.
- Final coat of epoxy paint.
- Corrosion resistant coating rotor and stator laminations.
- Stainless steel nameplate with all applicable NEMA MG 1 information.
- Super 'H' insulation including protection against fungus growth.
- NEMA MG-1 Design D
- Motor will have windings vacuum pressure impregnated three times with severe sea coast or open ocean rated epoxy.
- The motor frame will be finished with a corrosion resistant paint or coating. Exposed unpainted metal surfaces will be of a corrosion resistant material.
- An in-sight disconnect switch will be provided within range view of each motor as specified elsewhere. The 120-volt strip heater in each motor frame will be wired to the normally open auxiliary contact in the corresponding motor disconnect switch.

- Auxiliary span motor will be rated to be back driven up to and including 3600RPM.

Span Brakes
Furnish and install two 10" electrohydraulic thrustor type machinery brakes as shown on the plans. The brakes shall act upon brake wheels press fit onto shafts as called out on the mechanical drawings. See the machinery specifications for details.

Provide spring-set, thrustor-released, shoe-type, open brakes with corrosion-resisting fittings. Brake shall have the drum size and torque requirements as listed on the Plans, with permanent torque setting limited as required.

Furnish all brake wheels with the brakes by the brake manufacturer. Leave the bores undersize, and ship the wheels to the machinery manufacturer who shall finish-bore and press the wheels onto the gearbox input shaft.

Equip each brake with a hand release, which will not change the torque setting or require removable levers or wrenches. Locate the hand release mechanism on the side of the brake away from the main reducer. (Right hand and left hand units are required.) Provide each hand release with a lever type limit switch for interlocking purposes as described under "Interlocking." It shall not be possible to set the hand release of the brakes without tripping these switches. Switches shall be Cutler-Hammer Series E50, NEMA 6P+ with epoxy potted cord sets or approved equal.

In addition to the hand release limit switch, mount two lever type limit switches on each brake. One shall indicate that the brake is fully set, the other that the brake is fully released. Assure that the brake released limit switch (which shall have two normally open contacts) trips when the brake is electrically released or hand released. The brake set limit switch shall have one normally open and one normally closed contact and shall trip when the brake is fully set. Switches shall be Cutler-Hammer Series E50, NEMA 6P+ with epoxy potted cord sets or approved equal.

Each thrustor actuator shall be provided with a time delay valve adjustable between 0 and 5 seconds for setting the brake. Only an internal time delay valve constructed of stainless steel is acceptable. Adjustment must be infinitely adjustable between the minimum and maximum settings. These adjustments must be allowable with the brake in full service. Set the down-stroke time delays of the thrustors in such a manner that the brakes will not be applied simultaneously should electric power fail while the span is in motion. Adjust the intervals between the setting of the brakes to obtain smooth stopping of the span in the shortest possible time.

Provide the oil used in the thrustor operating chambers of the brakes to be of a grade as recommended by the manufacturer and approved by the Engineer. It shall have a free operating temperature range between -40 degrees and 66 degrees Celsius.

Provide 480-volt, three-phase, 60 Hertz, totally enclosed, squirrel cage motors controlled by magnetic contactors with manual-reset thermal overload relays to actuate the thrustors. The rated stalled thrust of each thrustor shall be not less than 135 percent of the thrust actually required to release the brake with the torque adjusted to the continuous rated value.

All exposed ferrous material shall be treated with a nitrocarburising process. This process shall improve wear resistance, lower the coefficient of friction and greatly reduce the tendency to weld or seize with a metallic counterpart. It shall also vastly improve corrosion resistance properties. The nitriting process

shall produce a thick E-Nitrite layer of at least 12μm. Painting and other finishes are not an acceptable replacement for Nitriting.

Equip each brake with a NEMA 3R enclosure, which encloses the entire brake assembly, including the brake thrustor unit, and the brake wheel, and should not prevent brake hand release operation.

The brakes shall be type MBT/E as manufactured by Mondel Engineering or approved equal by Bubenzer or Ametek.

Vector Motor Drives
The drives shall be properly sized based on the full load ampere rating of the motors and shall allow for 150% overload for 60 seconds. The correctly sized drive, meeting all the requirements, shall be provided at no additional cost to the County.

Vector drives must be four quadrant drives and shall be capable to run in speed and torque mode with adjustable torque limits in all four quadrants.

To minimize electrical and acoustical noise, and to eliminate low speed cogging, a minimum switching frequency of 15 kHz shall be used. The drive shall not "cog" at any frequencies with a 1,000:1 speed regulation. There shall be no sudden frequency shifts and associated acoustical noise shifts as the output frequency is varied between 0 and 60Hz.

The drive's input displacement power factor shall be 0.98 or better over the entire operating frequency and load range. Efficiency shall be measured 96% minimum at rated load. The Contractor shall provide manufacturers typical test results or calculations with submittal to verify efficiency and power factor.

The drives shall be provided with input reactors as specified by the drive manufacturer.

Output reactors shall be supplied as required per drive and motor manufacturer recommendations.

The vector drives shall have, but not be limited to the following features:

- Manufacturer provided ethernet communications module to allow transfer of all commands and operational data/faults to the PLC network
- High speed analog inputs
- Allow for smooth and instantaneous connection into rotating loads, regardless of commanded direction, without the need for any speed feedback.
- Inertia Ride-Through to allow for tripless operation during a prolonged power outage by using the rotating energy stored in high inertia, low-friction loads.
- Provide a torque proving circuit to ensure proper control of the load when transferring control between the drive and a mechanical brake.
- Slip Compensation to provide a minimum 0.5% speed regulation without feedback hardware.
- Encoder Feedback to provide ±2% regulation and the ability to hold full load at zero speed.
- Solid state output ground fault protection shall be provided.
- Adaptive electronic motor overload protection shall be provided which shall protect both the motor and the drives at all frequencies. This overload must be UL approved. Electronic thermal overload circuits which only protect the motor at full speed shall not be acceptable. The drive shall sense the load and speed and shall recalibrate the thermal trip curve to insure low speed motor protection. The initial trip point shall be adjustable from at least 40% of the drive continuous rating to account for motor magnetizing current.
- Input surge protection

- Input and output phase loss detection
- Output short circuit protection
- Four programmable digital dry contact outputs for Drive Trouble, Drive Running, Drive Ready, Spare.
- Programmable current limit.
- Remote drive reset contact.
- Minimum of 1,000:1 controllable constant torque speed range when in closed loop mode. Speed regulation shall be 0.01% or better over the entire speed range.
- Minimum of 2 second power loss ride-through capability. In the event of a loss of three-phase power lasting 2 seconds or less, the drive must maintain operation and prevent nuisance trips upon return of power.

The 'Drive Trouble' fault condition shall cause the drives to shut off and shall be annunciated to the PLC control system through the Ethernet connection. All faults shall be transmitted to the PLC. The conditions that shall cause a drive shutdown fault are at minimum as follows:

- Blown fuse.
- Instantaneous overcurrent trip.
- DC bus overvoltage.
- DC bus undervoltage.
- Excessive ambient drive heat sink over temperature.
- External fault input.
- Internally diagnosed, control failure.
- Motor thermal overload.
- Drive thermal overload.

The drives shall employ modular PC board design for ease of troubleshooting. All connectors must be polarized type and clearly marked on both the connector and PC board to ensure proper connection.

Each drive shall be provided with a door-mounted LCD Human Interface module station with the following minimum features:

- Remote versions for panel mount application
- Large and easy to read 7 line x 21 character backlit display
- Alternate function keys for shortcuts to common tasks
- "Calculator-like" number pad for fast and easy data entry
- Control keys for local start, stop, speed, and direction

All drive functions shall be programmable from the door-mounted keypad. The keypad shall be equipped with EEPROM and be removable so that the parameters can be downloaded into another drive.

The drives shall be provided with heavy duty dynamic braking resistors capable of providing 100% braking on a continuous basis and 150% dynamic braking for 60 seconds. The resistors shall be provided with NEMA 3R enclosures.

The drives shall be Magnetek G+ Series 4, no substitutions will be permitted.

Programmable Logic Controller (PLC)

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Control logic functions shall be performed by a PLC system, which shall provide for operation of the bridge and its auxiliaries in accordance with the system functioning specified herein and the control logic shown on the Plans.

The PLC control system shall be capable of full diagnostics and monitoring. It shall be able to assist in troubleshooting and indicate failures and alarms. All aspects of the control system/electrical infrastructure shall be monitored. Items to be included, but not be limited to, are communications protocols, circuit breakers, fuses, disconnect switch positions, overloads, starters, limit switches, drives, misc. faults, operational time outs, interlocking, error states, contradictory conditions, pushbuttons, selector switches, pilot lights, timers, relays, contactors, etc. The Contractor shall provide for the diagnostic and troubleshooting functionality of the system and any additional wiring/conduit/logic that may be necessary whether shown explicitly on the Contract documents or not.

The PLC shall be an Allen Bradley (AB) CompactLogix brand PLC with components, hardware and remote input/output drops or approved equal by Modicon or Siemens. The PLC shall be of modular construction, provide high-speed peer-to-peer networking, and be programmable with ladder logic.
Modules are defined herein as devices that plug into a chassis and are keyed to allow installation in only one direction. The design must prohibit upside down insertion of the modules as well as safeguard against the insertion of a module into the wrong slot or chassis via an electronic method for identifying a module. Electronic keying performs an electronic check to ensure that the physical module is consistent with what was configured. The PLC shall have downward compatibility whereby all new module designs can be interchanged with all similar modules in an effort to reduce obsolescence. The PLC shall have the ability to be updated electronically to interface with new modules.

All hardware of the PLC shall operate at an ambient temperature of 0 to 60 degrees C (32 to 140 degrees F), with an ambient temperature rating for storage of –40 to +85 degrees C (- 40 to +185 degrees F). The PLC hardware shall function continuously in the relative humidity range of 5% to 95% with no condensation. The PLC system shall be described and tested to operate in a high electrical noise environment.

The PLC shall have the capability of addressing up to 48 nodes. It shall also have the ability to communicate with up to 256 connections that contain I/O. Each input and output module shall be self-contained and housed within a chassis. The PLC shall include as an optional feature the capability of addressing remote input and output modules on EtherNet/IP or equivalent.

The PLC shall use multiple independent, asynchronous scans. These concurrent scans shall be designated for processing of input and output information, program logic, and background processing of other controller functions. Input and output devices located in the same backplane (local I/O) as the CPU will produce at the rate of the configured RPI (Requested Packet Interval), and for discrete input modules enabled for Change Of State (COS), at the time any point changes state.

The PLC shall have the ability to communicate with multiple remote I/O racks or devices configured with multiple I/O modules. Networks that allow remote I/O include EtherNet/IP or equivalent. It shall be possible to communicate with remote I/O racks or other PLCs via fiber optic cable by inserting fiber optic converters into the links. The fiber link must support distances up to 82,000 cable feet (25KM). Redundant fiber optic cabling shall be an option.

The PLC shall have the ability to support data communications networks in the same chassis by using Ethernet/IP.

The PLC shall have one dedicated Universal Serial Bus port communicating at 12mb/sec. The USB port is a device only programming port. USB ports must be usable for programming and data monitoring purposes.

The CPU shall be a self-contained unit and will provide control program execution and support remote or local programming. This device will also supply I/O scanning and inter-controller and peripheral communication functions. The operating system firmware shall be contained in non-volatile memory. An option shall be possible to store both the user program and system firmware in a removable non-volatile memory for backup/restore purposes. The operating system firmware can be updated via a separate software update tool to allow for easy field updates. The controllers shall allow the operating system to be updated using a suitably configured removable non-volatile memory card. The controller shall contain a minimum of 2 Mbytes of user memory.

The CPU within the system shall perform internal diagnostic checking and give visual indication to the user by illuminating a "green" (OK) indicator when no fault is detected and a "red" (OK) indicator (Blinking or Solid) when a fault is detected or by way of a display screen scrolling an error code and message. The front panel on the Controller shall include color LED indicators or 4-digit display showing the following status information:

- Program or Run mode of the controller
- The fault status of the controller.
- I/O status
- Secure Digital (SD) activity
- Force LED

The front panel of the Controller shall include a mounted keyswitch. The key shall select the following Controller modes: RUN – No control logic edits possible, program always executing; PROGRAM – Programming allowed, program execution disabled; and REMOTE – Programming terminal can make edits and change controller mode, including test mode, whereby the logic executes and inputs are monitored, but edits are not permanently active unless assembled. The front panel of the Controller shall include a USB port, to support upload and download, online edits, firmware upgrades, and bridging to other modules in the same chassis.

All system modules, local and remote chassis shall be designed to provide for free airflow convection cooling. No internal fans or other means of cooling, except heat sinks, shall be permitted. All system modules including the controller may be removed from the chassis or inserted in to the chassis while power is being supplied to the chassis without faulting the controller or damaging the modules. This is known as Removal and Insertion Under Power (RIUP). Alternately a software configurable option shall exist to fault the controller if required.

Program Creation and Storage

Memory state shall be selectable to allow for the most economical match to the intended application. It shall be possible to upgrade to a controller with a larger memory size simply by saving the program, upgrading the controller and downloading the program to the new system without having to make any program changes.

The controller will write all variable data to internal nonvolatile memory storage (Flash) during the power down cycle. The controller shall provide the capability to use commercially available, removable nonvolatile memory storage. The card shall be available from the supplier as an industrial rated device suitable for use in the same environment as the controller.
The controller will have the ability to store the user program, controller firmware and firmware for all other modules residing in the same chassis to the removable nonvolatile memory card. Additionally, when memory is restored a user selectable option to be restored in Run mode or Program mode shall be provided. The controller shall have the capability to insure, that if required modules in the chassis are flashed using the firmware files stored on the removable nonvolatile memory card, to the correct revision level for the project. The removable nonvolatile memory card shall support a Windows file system allowing multiple files to be stored on the card. The user can manually trigger the controller to save or load from the card and also configure the controller to load from the card on power up. The operator should be able to backup volatile memory, including data and program logic onto a personal computer storage device.

All user memory in the controller not used for program storage shall be allocable from main memory for the purpose of data storage. The PLC system shall be capable of storing 4 data types:

Predefined
User-defined
Module-defined
Add-on defined

Predefined data types include the following: alarm, axis, bool, cam, cam-profile, control, coordinate system, counter, etc. User defined data is limited to structures. Each structure contains one or more data definitions called members. Object includes a structure for each I/O module and system or module specific information (hidden from user). Add-on defined data type includes the Local and Parameter tags of the add-on instruction. It does not include the logic. Any data can be displayed in ASCII, Binary, Octal, Hexadecimal, or Decimal radices. Function-specific data types such as PID, Axis, Axis Group or Message shall have dedicated displays available annotating the meaning of specific control bits and words within them and allowing for selective control where appropriate.

If instructions or entire rungs are intentionally deleted from an existing logic program, the remaining program shall be automatically repositioned to fill this void. Whenever contacts or entire rungs are intentionally inserted into an existing program, the original program shall automatically be repositioned to accommodate the enlarged program. All rung comments shall maintain their original links.

The number of times a normally open (N.O.) and/or normally closed (N.C.) contact of an internal output can be programmed shall be limited only by the memory state to store these instructions. The number of times a timer or counter can be programmed shall be limited only by the memory state to store these instructions. Controller programs shall have immediate access to the sub elements of control structures by address and sub element mnemonic, such as timer accumulator value, timer done bit, or PID Process Variable value.

The programming format shall be IEC 1131-3 compliant Ladder Diagram (LD). The controller shall organize user applications as Tasks, which can be specified as continuous, periodic, or event based.

Variables within the controller shall be referenced as unique, default or user defined tags. Tag naming convention shall adhere to specifications in IEC 1131-2. Tags may be created off-line, on-line and at the same time the routine logic is entered. The system shall have the capability to store user tags names in the controller. Tags shall be available to all tasks in the controller (Controller Scoped) or limited in scope to the routines within a single program (Program Scoped) as defined by the user. Any tag shall have the ability to be aliased by another tag, which is defined and has meaning to the user. The ability to program control logic via tags of the Programmable Logic Controller System shall exist.

It shall be possible to program ladder diagram rungs with the following restrictions:

Series instruction count limited only by user memory
Branch extensions limited only by user memory
Branch nesting to six levels

The capability shall exist to interleave input and output instruction types on the same contiguous rung in the ladder diagram rungs. The capability shall exist to change a contact from normally open to normally closed, add instructions, change referenced tags, etc. It shall not be necessary to delete and reprogram the entire ladder diagram rung. It shall be possible to insert ladder diagram rungs anywhere in the program, even between existing rungs, insofar as there is sufficient memory to accommodate these additions. A single program command or instruction shall suffice to delete an individual ladder diagram rung from memory. It shall not be necessary to delete the rung contact by contact. A clock/calendar feature shall be included within the CPU. Access to the time and date shall be from the programming terminal or user program.

Latch functions shall be internal and programmable. The system shall have the capability to address software timers and software counters in any combination and quantity up to the limit of available memory. All management of these instructions into memory shall be handled by the CPU. Instructions shall permit programming timers in the "ON" or "OFF" delay modes. Timer programming shall also include the capability to interrupt timing without resetting the timers. Counters shall be programmable using up-increment and down-increment. Timer instructions shall have a time base of 1.0 milliseconds. The timing range of each timer shall be from 0 to 2,147,483,648 increments. It shall be possible to program and display separately the timer's preset and accumulated values.

The Programmable Logic Controller System shall use a signed double integer format ranging from -2,147,483,648 to +2,147,483,648 for data storage of the counter preset and accumulated values. The Programmable Logic Controller System shall store data in the following formats:

- Boolean values (0 or 1).
- Short Integer Numbers ranging from -128 to +127.
- Integer Numbers ranging from -32,768 to +32,767.
- Double Integer Numbers ranging from –2,147,483,648 to +2,147,483,647.
- Floating Point Numbers consisting of eight significant digits. For numbers larger than eight digits, the CPU shall convert the number into exponential form with a range of plus/minus 1.1754944 E -38 to plus/minus 3.402823 E +38.
- Long Integer Numbers consisting of 64 bits.

The capability shall exist to organize data in the form of User Defined Data Structures. All aforementioned data types, as well as others, can be used in such structures along with embedded arrays and other User Defined Structures.

The Programmable Logic Controller System shall have support for integer and floating point signed math functions consisting of addition, subtraction, multiplication, division, square root, negation, modulus, and absolute value. Trigonometric instructions supported must include Sine, Cosine, Tangent, Inverse Sine, Inverse Cosine, and Inverse Tangent. These instructions must fully support floating-point math. Additional

floating point instructions supported must include Log 10, Natural Log, and Exponential. It shall be possible to complete complex, combined calculations in a single instruction, such as flow totalizing or equations of the format ((A+((B-C)*D))|E).

File function instructions supported shall also include Sort, Average and Standard Deviation. Value arrays shall be limited in size only by the amount of available memory. Arrays shall be configurable with one, two or three dimensions. The CPU shall support indexed addressing of array elements. Array element manipulation instructions such "array copy" (COP), "array copy with data integrity" (CSP) and "array fill" (FLL), "array to array" (MOV), "element to array" (FAL), "array to element" (FAL), and "first in-first out" (FIFO) shall be supported by the system. The four function and math instructions and instructions for performing "logical OR", "logical AND", "exclusive OR", and comparison instructions such as "less than", "greater than", and "equal to" shall be included within the system. All instructions shall execute on either single words or array elements.

For any module specifically associated with the Programmable Automation Controller, it shall be possible to configure operation and query the current status of all channels through controller scoped tags without any programming.

The system shall contain instructions, which will construct word shift registers (SQI, SQO, and SQL). Additional instructions shall be provided to construct synchronous bit shift registers (BSR and BSL).

The Programmable Logic Controller System shall have a jump instruction which will allow the programmer to jump over portions of the user program to a portion marked by a matching label instruction.

The Programmable Logic Controller System shall have the ability to provide a master system clock and the 1588 PTP v2 CIP Sync object to allow time synchronization and transport and routing of a system clock to the control system and motion axes in a local chassis or on an Ethernet/IP network.

It shall be a function of the CPU to automatically manage all data types. For example, if a word stored in an Integer tag is transferred into a Floating Point tag, the CPU shall convert the integer value into floating point prior to executing the transfer.

In applications requiring repeatable logic it shall be possible to place such logic in a subroutine section. Instructions which call the subroutine and return to the main program shall be included within the system. It shall be possible to program several subroutines and define each subroutine by a unique program file designator. The controller will support nesting of subroutines up to available stack at the moment of the call. It shall be possible to pass selected values (parameters) to a subroutine before its execution. The number of these parameters is limited only by available memory. This allows the subroutine to perform mathematical or logical operations on the data and return the results to the main program upon completion. These subroutines will be accessed by jump-to-subroutine instructions.
The system shall have the capability to enter rung comments above ladder diagram rungs. These comments may be entered at the same time the ladder logic is entered. The program shall be fully commented.

The capability shall exist for adding, removing, or modifying logic during program execution in routines of LD, FBD, SFC, and ST languages. When changes to logic are made or new logic is added it shall be possible to test the edits of such logic before removal of the prior logic occurs. It shall be possible to manually set (force) either on or off all hardwired discrete input or output points from the programming panel. It shall also be possible to manually set (force) an analog input or output to a user specified value. Removal of these forced I/O points shall be achieved either individually or totally through selected keystrokes. The programming terminal shall be able to display forced I/O points.

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A means to program a fault recovery routine shall exist. When a major system fault (Controller Fault) occurs in the system, the controller fault recovery routine shall be executed and then the system shall determine if the fault has been eliminated. If the fault is eliminated, program execution resumes. If the fault still exists, the system will shut down. The capability shall exist for each program to have its own fault routine for program fault recovery. Each having the same features as the controller based fault routine. An instruction shall be available to give the control program diagnostic information, state control, and sequencing of a process simultaneously, while allowing the capability of user-friendly state programming techniques.

An instruction shall be supported to incorporate closed loop control systems. The "proportional", "integral", and "derivative" elements shall be accessible to the user in order to tune a closed loop system. This instruction must fully support floating-point math.

The system shall support both bit and word level diagnostic instructions.

To facilitate conditional event detection programming, output instructions shall include "one shot" instructions, which may be triggered on either low-to-high (rising) or high-to-low (falling) rung conditions. To facilitate debugging, an "always false" instruction shall exist which may be utilized to temporarily inhibit the execution of control logic.

The controller shall support Master Control Reset (Relay) type functionality to selectively disable sections of logic.

The controller shall include direct support of FOR-NEXT loop constructions.

Controller files will have the ability to be exported and edited in L5k, (text) format or XML format.

Uninterruptible Power Supply (UPS):

The UPS shall be a DIN rail mounted unit that will maintain power to the PLC system for ten minutes in the event of a short power outage. It shall be rated for 120 VAC, 60 hz. It shall be sized by the control system vendor and calculations shall be submitted for approval. It shall have a simulated sinewave output. It shall have short circuit and overcurrent protection. It shall be provided with a sealed, non-spillable, maintenance free lead acid battery. It shall have an operating temperature range of 0 °C to 50 °C. It shall be provided with a communications port for Industrial Ethernet protocol to allow for communication with the PLC and a USB communication port. The UPS unit shall provide automatic bypass and an audible alarm upon UPS failure.

It shall have the following certifications and compliances:

- Low Voltage Directive:EN62040-1
- EMC Directive: EN62040-2
- Class 1 Division 2 - ANSI ISA 12.12.01/CSA 213
- RoHS Compliant
- UL 60950, E137632, CUL/CSA-C22.2, No. 234-M90.
- UL Recognized Component, UPS Equipment

- UL 1778 5th Ed., CSA C22.2 No. 107.3
- Suitable for UL 508 at full load output (no derating) and Industrial Control Equipment Applications CSA C22.2 No. 107.1
- Overvoltage Cat III, Pollution Degree III

The UPS unit shall be approved equal to a Sola/Emerson SDU AC-A series.

Noise Filter

The Contractor shall furnish and install one active tracking noise filter on the input of each PLC rack. The noise filter shall be a series connected high frequency noise filter with transient protection. It shall offer hard wired connection to all critical loads and rated for an industrial environment and equipment. It shall reduce mode transient to +/- 2 volts, have a surge capacity of 45,000 amps, provide transient protection in all modes (line to neutral, line to ground, and neutral to ground), have an LED power indication, and be UL approved. The 120VAC MCOV shall be rated 150 VRMS. The line frequency response time shall be less than 0.5 nano-seconds. The operating temperature shall be –40°F to 115°F at full load. The unit shall be capable of protecting against a peak surge current of 15,000amps in all modes. The noise filter shall be the Islatrol® IC+/LRIC+ Series manufactured by Emerson Electric or engineer approved equal.

Laptop Computer

A laptop computer shall be provided to allow the PLC and vector drive programs to be modified as required in the future. The laptop computer shall be a Dell Latitude 7490 or engineer approved equal. It shall have the following features at a minimum:

- 8th Gen Intel® Core™ i5-8250U Processor (Quad Core, 6MB Cache, 1.6GHz,15W)
- Windows 10 Pro 64bit English
- Intel® UHD Graphics 620 with Displayport over USB Type-C with Core I5-8250U
- 8GB, 1x8GB, DDR4 2400MHz Memory
- M.2 256GB SATA Class 20 Solid State Drive
- 14.0" FHD 1920 x 1080 Anti-Glare,Non Touch HD CAM/Mic, WWAN/WLAN, Mag Alloy back
- Internal English Keyboard, Backlit
- Intel® Dual-Band Wireless-AC 8265 Wi-Fi + BT 4.2 Wireless Card (2x2)
- (4-cell) 60 Whr Express Charge Capable
- 3 Years Hardware Warranty with Onsite/In-Home Service after Remote Diagnosis
- 65W AC Adapter, 3-pin
- Nylon Carrying Case

The unit shall be an intelligent terminal, functioning both as a programming and a data terminal. It shall permit PLC programming, including loading, editing, and monitoring ladder diagram programs in memory by entering through the keyboard and monitoring on the display. Program instructions shall be in the form of standard symbols similar to those used for electromagnetic control equipment.

The laptop shall have the latest editions of Microsoft Word and Excel preinstalled, along with software packages required for programming, viewing, and interfacing and any other software tools

required for the PLC, HMI and vector drives. The Contractor shall include all CD-ROM's, manuals and other materials. The Contractor shall provide all licenses and original CD-ROM or Disk copies with the computer for all software installed.

Managed Ethernet/Fiber Optic Switch

1. All ethernet switches will be of the managed type. Ethernet switches will be industrial rated and have at a minimum of 8 - 10/100 Base ethernet ports and 4 - 100 Base fiber multimode ports with ST connectors. Ethernet switch will be capable of operating in -40 Deg C to 70 Deg C. It will have ESD and surge protection on all built in ports. It will be auto sensing 10/100 Base TX, duplex, and MDIX. It will have a power input range of 10-49VDC. It will be able to store 8000 MAC addresses. It will have the following fully managed features:

a. SNMP v1, v2, v3 and web browser management

b. EtherNet/IP CIP messaging

c. Web configuration

d. 802.1Q tag VLAN and Port VLAN

e. 802.1p QoS and Port QoS

f. Port Trunking

g. Port Mirroring

h. Local Port IP Addressing

i. 802.1AB-2005 LLDP (Link Layer Discovery Protocol)

j. Port Security – MAC Address Based Filtering

Human Machine Interfaces (HMI)

1. HMI will be capable of operating within the operating range of 0-55 Deg C. HMI enclosure will be rated NEMA 4X and provided with a protective cover. HMI will have a color TFT LCD touch sensitive display. The diagonal display size will be 15" and utilize a 4:3 aspect ratio. Touchscreen will be analog resistive. The HMI will have a minimum of 512MB RAM, 512MB Storage, and 80 MB nonvolatile storage. Each HMI will be equipped with dual 10/100 Base-T ethernet ports. HMI will also feature 2 USB ports and one SD card slot. HMI will be equipped with all necessary operating system/software such as the latest required windows operating system and FactoryTalk View Studio.
2. The HMIs will be utilized for monitoring purposes, maintenance operations, and bypass control options. The HMIs are connected to the PLC control system. By means of the HMI the user can operate items described within and visualize the state and values of the system in its entirety.
3. A battery-less design is preferred. In case that an internal battery is needed a minimum of 10 years no-maintenance requirement is a must.
4. The HMI will have the following integrated communication ports and other connections at minimum:

Ethernet RJ45, interface: IEEE 802.3

Ethernet RJ45, interface: 10BASE-T/100BASE-TX

USB 2.0 port mini B USB

USB 2.0 port USB type A

5. The HMI must be UL marked and Comply with Underwriters Laboratories Inc., UL508, Industrial Control Equipment
6. The HMI software will have the following requirements at minimum:

Display of animated synoptic screens with different types of animation (e.g. pressing touch-sensitive zone, changing of color, filling, movement, rotation, size, visibility and value display).

Possibility of control and modification of numeric and alphanumeric variables.

Display of date and time.

Real-time and trending curves with log.

Multi-window with emerging menus management.

Pages can be called up by the user.

Application and log support in CF, SD format external application memory card or USB.

Management of sound messages and integration with images.

Availability of screens design and configuration software in a Windows environment.

Extension capabilities and migration utilities between terminals improvements

Built-in applications for alarms, event and messages management with dynamic capabilities and with no limitation in the number of alarms.

Built-in applications for login and control access

Resource files concept and facilities for Multilanguage migrations

Capability to customize the built-in applications in aspect and functionality

Dynamic screen capabilities: dynamic texts, graphs etc

HMI variables accessible to/from the Display and to/from the HMI controller

Remote Monitoring & Control using Webgate.

Program uploading & Downloading Using USB

All included, no extra cost for each function above

7. The HMI Alarms will be capable of the following:

Display alarms in Alarm Summaries or Alarm Banners

Display both diagnostic and variable alarms

Monitor bit and word addresses

Group alarms in Alarm Categories

Trigger alarms by Limit, Deviation by Percent, or Deviation by Fixed

View three types of Alarm Summary displays: Active, History, and Log

Acknowledge individually or as a group

Runtime language swapping for alarm messages

Print and save alarm logs

8. The HMI Data logging will be capable of the following:

Analyze, audit, and track performance

Display logged data in a Trend Graph:

Historical Trend Graph

Real-Time Trend Graph

Plot Trend Graph

Toolchest Trend Graph item

Collect data at regular intervals or when a trigger is activated

Store data in DRAM, SRAM, USB storage, CF card, or network storage

Convert data logging files into .CSV fi les

Display logged data from multiple terminals

Open Non-Proprietary Design
The system program/logic shall be established, designed, coded, programmed, for the full benefit of the Westchester County DPW. The program and functionality of the system shall be owned by the Westchester County DPW and have the ability to be maintained by more than one qualified maintenance vendor.

Ways that the upgraded control system shall be open and non-proprietary include:

- All application programs shall be un-protected (not password protected or locked) so that any maintenance vendor may view the programs for troubleshooting and maintenance. However, if a password is required, through the standard programming procedure, the password shall be made readily available to the Westchester County DPW.
- Westchester County DPW shall own the application programs for its own use. Proprietary application software shall not be used or if it is used rights to maintain and modify the software as well as source code shall be given to Westchester County DPW and their representatives. This only includes application software and not off the shelf software such as HMI development or PLC development software.

Monitored Operations
All span operations shall be datalogged, recording both operating parameters and faults/errors. The sequence of operations describes what faults shall be listed. The following parameters at minimum shall be logged:

- Drive motor Kilowatts
- Drive motor RPM
- Span position
- Errors
- Faults
- Any other functions as determined by the engineer

The kilowatt and position data shall be recorded at 10 samples per second, and all faults and errors shall have a time/date stamp at a minimum 1-second resolution. Additional parameters may be added during the shop test and bridge startup – these shall be included as part of this item.

Rotary Cam Limit Switch

Furnish and install a rotary cam limit switch for span position on the machinery platforms where indicated on the Plans. Each limit switch shall be a rotary, cam-operated limit switch in a NEMA 4X enclosure and shall be coupled to the operating machinery as shown on the drawings, which shall rotate the input shaft.

The switch contacts shall have a minimum AC inductive continuous current carrying rating of 15 A and a minimum DC resistive continuous current carrying rating of 15 A. They shall be UL and CSA listed.

The limit switches shall have circuits individually micro-adjustable and provisions for internal vernier adjustments. The number of contacts shall be as shown on the plans. The limit switch shall come with a 7:1 gear ratio. The limit switch shall allow for a + or - 1/4 degree contact operation repeatability. Each contact of the limit switch shall be SPDT precision-type, snap-action switches.

Provide Gemco 1980 series with contacts and gearboxes as shown on the plans, adjustable input couplings, NEMA 4X stainless steel enclosure or approved equal, and they shall be driven as shown on the plans furnished with the operating machinery.

The span position limit switch shall be provided with an internal absolute position encoder that shall provide absolute feedback for position control and high resolution incremental feedback for speed control. They shall be dual port Ethernet encoders including an embedded Ethernet/IP switch to connect additional E/IP capable product in series and/or support a Device Level Ring (DLR) for Ethernet media redundancy. They shall be designed for high performance and reliability in harsh industrial environments providing high resolution absolute positioning. They shall be provided with single-turn 16 bit resolution.

They shall feature:

- EtherNet/IP Interface
- Embedded switch
- Hardware/software IP address setting
- Single turn resolution up to 16 bits
- Protection class up to IP67
- Device Level Ring (DLR)
- Revolution divisor
- Solid shaft as per the mechanical drawings
- M12 Connectors
- Status indication LEDs
- RSLogix 5000 Add-On-Profile

The following parameters shall be Configurable:

- Counting direction
- Counts per revolution
- Preset value
- Velocity unit

- IP address
- Counts of revolution

The encoders shall be AMCI RM25, Allen Bradley model 842E, Sick model AFM60 or Engineer approved equal.

Proximity Switches
Lever-less mechanical limit switches shall be provided for span and end machinery indication and interlocking. They shall be enclosed in a stainless steel housing rated NEMA 4X and 6P. They shall be provided with single pole, double throw contacts end sensing contacts rated for 10 amperes. The contacts shall be silver cadmium oxide, gold flashed, and shall have a temperature rating of -40 to 221 degrees F. They shall have a repeatability of 0.002", and a response time of 8ms. They shall be provided with six foot epoxy potted cordsets. They shall have a nominal sensing distance of ¼", and shall be provided with a magnetic sensor that will provide for a ¾" sensing distance. The lever-less limit switches shall be Model 81 GO switch with model AMP3 magnetic target as manufactured by Emerson GO or engineer approved equal by Allen-Bradley or Eaton.

Encoder Buffers
The encoder buffer shall accept 4-26 VDC signals and provide two independent and completely isolated line driver outputs of 5-26 VDC based on user defined voltage levels. It shall be provided with optically isolated inputs that accept quadrature or single channel inputs, with or without their complements, from differential line drivers, open collector, or from proximity probes. The encoder buffer shall also have the ability to repeat and amplify signals. Each output of the encoder buffer shall be user definable from 5 to 26 VDC. In addition to having short circuit protection, outputs shall be ESD protected according to MIL-STD-883. Each connector of the encoder buffer shall be equipped with two positions for +VCC and common, as well as two extra field accessible tie points. The encoder buffer shall be capable of driving the output signal up to 26 VDC, and will function with either output disconnected.

STANDARD OPERATING CHARACTERISTICS:

- Input Signal: 2 or 3 channel quadrature signal, sine or square wave, open collector, differential, or single ended line driver.
- Input Signal Current: 2.2 mA minimum, 3.5 mA typical
- Input Impedance: Optically isolated, 1 kOhm at 4V, 6.8 kOhms at 24V typical. Current limited.
- Frequency Range: 0 - 120 kHz
- Output Signal: Two independent, isolated line driver output sets (A/A, B/B)
- Supply Voltage: 5 - 26 VDC
- Output Current: 150 mA (maximum per channel)
- Wire Gauge Accepted: 26 -16 AWG
- Environmental range: 0°C to 50°C at 98% RH non-condensing

The encoder buffers shall be model RIM SS2 as manufactured by Dynapar or engineer approved equal.

Deceleration Check Speed Switches
The electronic speed switches shall be rotation monitoring systems with two adjustable set points designed to detect unwanted over speed, under speed or stoppage in motors. In the event of rotational failure, the relays can be used for equipment shutdown and to provide an alarm. The sensor receives a pulse output from a motor encoder buffer and measures this frequency signal to determine shaft speed, and compares this to the pre-adjusted set point. The relay output can then be used for equipment

shutdown or to provide an alarm, assuring machine protection and process integrity. The sensor shall be fail-safe; any malfunction during operation will de-energize the control circuit.

The sensor shall be an LRB 2000 specifically ordered with no start delay loss of feedback as manufactured by Electro-Sensors or Engineer approved equal.

- Input Power 115 Vac, 60 Hz
- Sensor Input Signal Type NPN Open Collector, Amplitude 5 Vdc, Pull-Up 4.7 KOhms, max Frequency Range 0-666.67 Hz

Set Point Data

- Under or Over Speed Set Point Relays Two form C, SPDT isolated 5A 115V ac resistive
- Set Point Adjustment Rotary Switches: (1) tens and (1) ones digit

General Specifications

- Housing and Cover NEMA1, Approved to UL 508 and CSAC 22.2 #14-95 Standards
- Stand-Alone Mounting

Control Apparatus and Miscellaneous Equipment
Control apparatus shall conform to the applicable requirements of NEMA Publication No. ICS, latest revision, Industrial Control and Systems, rated as shown on the Plans or as required and to the following:

Multi-Functional Power Monitor: The Multi-Functional Power Monitor shall be rugged metal housing with standard switchboard dimensions and cutout per ANSI 39.1. It shall be 300 volts phase to neutral, 600 volts phase to phase, for 277/480 connection. Three (3) current inputs, 5A nominal current input, Continuous overload 10A maximum. Frequency range from 45-75 Hz and a operating temperature of -20C to +70C. All meter setup parameters and Max/Min data should be contained in Non-Volatile RAM. The monitor should measure true RMS and have 64 samples per cycle with 1-second-update time. It shall be provided with an ethernet port to send all parameters to the PLC. The Multi-Functional Power Monitor shall be Shark 200 as manufactured by Electro Industries/GaugeTech or equal as approved by the Engineer.

Circuit Breakers: All branch circuits from the power buses shall be protected by molded-case circuit breakers mounted on the control panels. All breakers shall have quick-make and quick-break contacts, and the mechanism shall be trip-free and trip indicating. All circuit breakers and motor circuit protectors shall be provided with at least two form C auxiliary contacts for PLC input and status indication. Frame sizes shall not be less than 100 amperes. The breakers shall be equipped with thermal-magnetic trips or adjustable, instantaneous, magnetic trip units, with trip rating as shown on the Plans or as required. Molded-case circuit breakers shall meet the requirements of the latest revision of NEMA Publication No. AB1. The service entrance circuit breakers are to be 600 volt rated, frame size as indicated on the plans and shall be provided with electronic trip unit with independently adjustable short time pick-up and time delay, set to trip as per the plans. Interrupting capacity shall be no less than 100,000 AIC. Circuit breakers shall be Westinghouse Series C, Type LD with LS trip unit, Type TA or Engineer approved equal manufactured by General Electric or Square D Company.

Motor Starters and Magnetic Contactors: The continuous current rating of contactors and starters shall be adequate for the connected loads, and no starters shall be smaller than NEMA Size 1 unless otherwise noted. All starters shall be full voltage types, 600 VAC, 60 Hertz, rated with 120 VAC operating coils. All contact

poles shall be provided with arc chutes, and contactors rated 150 amperes and above shall be equipped with magnetic blowouts. Reversing contactors shall be electrically and magnetically interlocked.
Starters for the brakes shall be IEC devices rated 12 amperes minimum and provided with manual motor starters to provide for isolation and overcurrent protection sized for the motor FLA and auxiliary contacts for PLC interfacing and indication. They shall be Allen Bradley Bulletin 103S or equal by Square D or ABB.

Service Disconnect Switches: Unfused safety switches, for use as disconnects, shall be installed where shown on the plans. The switches shall be nonfusible, heavy-duty, 600 VAC safety switches in watertight and dust-tight NEMA 4X, stainless-steel enclosures. Each disconnect shall be furnished with two N.O. auxiliary contacts and phenolic nameplate to identify the switch. The rating shall be as required and/or shown on the plans.

Motor Disconnect Switches: Unfused safety switches for use as disconnects, where required, shall be installed within the range of view of its respective motor, brake, or span lock. The switches for the main motors and span lock motors shall be tag out lockable, non-fusible, heavy-duty, safety switches, rated as shown on the Plans, in waterproof, NEMA 4X, stainless steel enclosures. The span drive motor disconnect switches shall be provided with auxiliary contacts for disconnecting the motor disc brakes. Each disconnect shall be furnished with a N.O./N.C. auxiliary contact and phenolic nameplate to identify corresponding motor.

Brake motor disconnect switches: The disconnects shall be three pole manual motor starting switches rated 30 amperes. They shall be provided with a weatherproof housing and shall be engineer approved equal to the Square D class 2520 type KW2.

Control Relays: Auxiliary control relays shall be multi contact magnetic relays with contacts rated at 10 amperes, 600 volts, on a continuous basis. Relays known to meet the specified requirements are the Square D class 8501 type X or approved equal.

Phase Failure and Reversal Relay: This relay shall prevent energizing operating the span in the event of reversed phase sequence, loss of one phase, or low voltage. The phase failure and reversal relay shall be the Square D Class 8430 Type MPD or approved equal.

Selector Switches and Pushbuttons: Pushbuttons and control switches shall be heavy-duty, oil-tight, contact blocks operated by glove handle selector knobs, key switches and push-button operators as indicated on the Plans. Contacts shall be fine silver, capable of interrupting 6 amperes at 120 volts AC, and of continuously carrying 10 amperes. Switches and pushbuttons shall be Square D class 9001, type K, NEMA 4 or approved equal.

Indicating Lights: Indicating shall be heavy-duty, oil-tight pilot lights with one or two fields as required as per the plans. They shall be provided with LED lamps the color of the lamp lens and shall be rated at 120 VAC. Where group testing cannot be accomplished through the PLC the lights shall be provided with a push to test feature. All lenses shall be glass, with color and marking as shown on the Plans.

Terminal Blocks: Terminal blocks for conductors of Size No. 8 AWG and smaller shall be feed through terminal blocks with stud and nut type connection DIN rail mounted modular terminal blocks. Barriers shall be not less than 13mm high and 3mm thick and shall be spaced 16mm center-to-center. Straps, studs and nuts shall be of a material for use in highly corrosive atmospheres and shall be rated for 57 amperes for a terminated conductor. The blocks shall provide a withstand voltage rating of 800 volts per

IEEE switchgear standards. The terminal blocks shall provide studs and nuts suitable for use with locking fork wire connectors. Corrosion resistant marking strips shall be provided for conductor identification. At least ten- percent spare terminals shall be provided. Terminal blocks shall be Phoenix Contact type RBO 5 or approved equal.

Terminal Connectors: Terminal connectors shall be seamless, heavy duty compression locking fork terminals manufactured from pure electrolytic copper tubing. Terminals shall be tin plated and provided with a double-thick tongue and insulation grip. Terminals and compression tools must be approved by the Engineer.

Wire Ferrules Connectors: For conductors not suitable for locking fork terminals, they shall be provided with seamless, heavy-duty insulated wire ferrules terminal lugs. Terminal lugs shall be installed per lug manufacturer recommendations using the proper tools approved by the manufacturer.

Power Distribution Blocks: Power distribution blocks for all conductors larger than No. 8 AWG, shall be fingersafe, fabricated from copper and approved equal to Ferraz Shawmut FSPDB series, sized as required. Finger-safe fully insulated block shall ensure that no one can touch live parts. They shall be provided with recessed termination screws and wire openings providing IP20 grade protection and qualify as "finger-safe" per IEC 529, integral DIN rail adaptors allowing for quick and easy installations on 35mm DIN rail, and captive termination screws. Provide end anchors for rigid end stops.

Nameplates: Nameplates shall be provided for all aforementioned devices and shall be made of laminated phenolic plastic with white front and back and black core and shall be not less than 2.3mm thick. The lettering shall be etched through the front layer to show black engraved letters on a white background. Lettering shall be not less than 6mm high, unless otherwise detailed on the Plans. Nameplates shall be securely fastened to the equipment with stainless steel screws.

Bridge Control Cabinets
Control panels enclosed in freestanding cabinets shall be furnished and installed in the operator house and machinery spaces where shown on the Plans. All circuit breakers, PLC racks, switches, contactors, relays, regulating equipment, and other apparatus for control of the span and its auxiliaries shall be mounted on these enclosed panels. The arrangement and line-up of the individual control cabinets shall be as shown on the Plans.

All equipment in each control cabinet shall be mounted on sheet-steel bases, and each device shall be front-connected, front-wired, and removable from the front. The equipment in all cabinets shall be arranged for ease of access and for safety and convenience of operation. Special care shall be taken to obtain a systematic and neat arrangement of the equipment. Each device shall be suitably named and plainly marked by a laminated nameplate mounted near the device on the panel. Each nameplate shall show an approved descriptive title for the apparatus, together with the device designation appearing on the schematic wiring diagrams.

Each indoor control cabinet shall be a NEMA Type 12 enclosure constructed of No. 12 gauge sheet-steel and shall be reinforced with steel angles or channels to provide a rigid, freestanding structure. Exterior control cabinets shall be NEMA 4X or NEMA 12 stainless steel. The control cabinets shall be provided with hinged doors on the front of each panel section. Door panels shall be gasketed and shall be provided with three-point, vault-type latches. Drive and control panels shall be provided with fan and filter ventilation. All hardware shall be corrosion resistant. Thermostatically controlled strip heaters shall be

provided in each cabinet to prevent build-up of excess moisture. Each panel shall be provided with suitable interior light fixtures and a duplex receptacle.

Each control panel enclosure shall be as shown on the plans. If the final cabinet dimensions, as established by the manufacturer, should necessitate rearrangement or modification of the equipment in order to fit in the available space, such rearrangement or modifications shall be made and at no extra cost. The final arrangement of all equipment in the operator house shall be subject to the approval of the Engineer.

The indoor control panel enclosures and all metal reinforcing shall be painted inside with two coats and outside with three coats, consisting of one coat of primer followed by one coat of gray enamel on the inside surfaces and two coats of gray enamel outside. The finish coat shall be ANSI 61 light gray enamel.

All contactors, relays, and other devices shall be of required current carrying and interrupting capacity. All apparatus shall be of substantial construction and shall conform to the requirements of NEMA Standards Publications ICS 1 and 2, 2000, for industrial control devices.

All wire shall be flame-retardant, ethylene-propylene insulated, switchboard wire, Type SIS. Conductors shall be stranded copper not smaller than No. 14 American Wire Gauge.

For each assembled control panel, all outgoing wire, No. 8 AWG or smaller, shall be connected to terminal blocks installed at the sides of the cabinet. The control panels shall also provide sufficient extra terminals to allow connection of all wires coming from limit switches and other devices that go on to the bridge control console and other locations as required, even though these wires do not connect to apparatus on the control panels. Spare terminals totaling at least 10 percent of those actually used shall be provided. Each terminal shall be identified per wire number shown on the Contractor's schematic wiring diagrams.

All panel wiring shall be arranged systematically so that circuits can be readily traced. The wiring shall be installed in a network of troughs consisting of horizontal and vertical sections securely bolted to the panels. The troughs shall be fabricated from heavy duty Noryl plastic shaped into a channel cross-section. After installation of the wiring, an insulated, flanged cover shall be snapped over the open side of each trough section.

Motor Control Center (MCC)

The Motor Control Centers (MCC's) shall include, but not be limited to, all parts, materials and associated appurtenances described below, such as MCC enclosures, covers, wireways, mounting hardware, motor control and protection devices.

The MCC's shall be constructed to meet or exceed the requirements within NEMA ICS-2 and UL845 for motor control centers. The MCC's shall be designed, manufactured, and tested in facilities registered to ISO 9001 quality standards. The MCC enclosures shall be NEMA/EEMAC Type 12 rated.

The Motor Control Center(s) shall be 600 Volt class suitable for operation on a three-phase, 60 Hz system. The system operating voltage and number of wires shall be as indicated on the Plans.

Each MCC shall consist of one or more vertical sections of heavy gauge steel bolted together to form a rigid, free-standing assembly, and mounted on top of a 2inch concrete sill or pad, as shown on the Plans. The entire assembly shall be constructed and packaged to withstand all stresses included in transit and during installation. MCC shall be delivered in individually wrapped factory fabricated fiberboard type containers, with lifting angles mounted on each supporting structure. MCC shall be handled with care to prevent internal component damage, and denting or scoring of enclosure finish. The Contractor shall not install damaged MCC.

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Structures shall be totally enclosed dead-front, free-standing assemblies. They shall be no more than 90inch high and 20inch deep. Structures shall contain a horizontal wireway at the top, isolated from the horizontal bus and shall be readily accessible through a hinged cover. Adequate space for conduit and wiring to enter the top or bottom shall be provided without structural interference.

Structures shall be capable of being bolted together to form a single assembly. The total width of one section shall be 20inch. Widths of 25inch, 30inch, and 35inch can be used for larger devices. Where required, 40inch wide section shall be provided for the Power Panel (MCC-PP), as shown on the Plans.

Each section shall have all the necessary hardware and bussing for modular plug-in units to be added and moved around. All unused space shall be covered by hinged blank doors and equipped to accept future units. Vertical bus openings shall be covered by manual bus shutters.

A vertical wireway with minimum of 35 inches square of cross-sectional area shall be adjacent to each vertical unit and shall be covered by a hinged door. Wireways shall contain steel rod cable supports.

All full voltage starter units shall be of the drawout type. Drawout provisions shall include a positive guide rail system and stab shrouds to absolutely ensure alignment of stabs with the vertical bus. Drawout units shall have a tin-plated stab assembly for connection to the vertical bus. No wiring to these stabs shall extend into the bus compartment. Interior of all units shall be painted white for increased visibility. Units shall be equipped with side-mounted, positive latch pull-apart type control terminal blocks rated 600 volts. Knockouts shall be provided for the addition of future terminal blocks. All control wire to be 14 AWG SIS type.

All drawout units shall be secured by a fastening device located at the front of the unit. Each unit compartment shall be provided with an individual front door.

An operating mechanism shall be mounted on the primary disconnect of each starter unit. It shall be mechanically interlocked with the unit door to prevent access unless the disconnect is in the OFF position. A defeater shall be provided to bypass this interlock. With the door open, an interlock shall be provided to prevent inadvertent closing of the disconnect. A second interlock shall be provided to prevent removal or reinsertion of the unit while in the ON position. Padlocking facilities shall be provided to positively lock the disconnect in the OFF position with from one (1) to three (3) padlocks with the door open or closed. In addition, means shall be provided to padlock the unit in a partially withdrawn position with the stabs free of the vertical bus.

Each structure, except the MCC-PP section where required, shall contain a main horizontal copper tin-plated bus, with minimum ampacity of 600 amperes as shown on the drawings. The horizontal bus shall be rated at 150 degrees F temperature rise over a 104 degree F ambient in compliance with UL standards. Vertical bus feeding unit compartments shall be copper and shall be securely bolted to the horizontal main bus. All joints shall be front-accessible for ease of maintenance. The vertical bus section containing the Main Breaker (CB-MCC) shall be fully rated 600 amperes. Other bus vertical sections shall be rated 300 amperes. The MCC-PP section where required, shall have independent bus/wire work fed from the designated breaker (CB-PP), as shown on the Plans.

The vertical bus shall be completely isolated and insulated. It shall effectively isolate the vertical buses to prevent any fault-generated gases to pass from one phase to another. The vertical bus shall include a shutter mechanism to provide complete isolation of the vertical bus when a unit is removed.

Buses shall be braced for minimum 42,000 amperes rms symmetrical.

A copper ground bus shall be furnished firmly secured to each vertical section structure and shall extend the entire length of the MCC.

Each structure shall contain tin plated vertical ground bus rated 300 amperes. The vertical ground bus shall be directly connected to the horizontal ground bus via a tin-plated copper connector. Units shall connect to the vertical bus via a tin-plated copper stab.

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All combination starters shall utilize a unit disconnect. Magnetic starters shall be equipped with double-break silver alloy contacts. Each starter shall have minimum one (1) NO auxiliary contact or as indicated on the plans. All coils to be color-coded through size 5 and permanently marked with voltage, frequency and part number.

The disconnect shall include an electrical interlock for disconnection of externally powered control circuits.

Auxiliary control circuit interlocks shall be provided where indicated. Auxiliary interlocks shall be field convertible to normally open or normally closed operation.

Minimum starter and contactor size shall be NEMA Size 0.

Motor starters and contactors shall be Cutler-Hammer Freedom Series, Square D type S series, or Engineer approved equal.

Motor starters and contactors shall be designed to accommodate two (2) auxiliary contact blocks, each capable of a combination of up to four (4) normally closed or four (4) normally open auxiliary contacts. Contacts to be color-coded; black designating NC and silver designating NO. Contacts to be rated ten (10) amperes continuous, 7200 VA make, 720 VA break for 120 through 600V AC, and 69 VA make and break for 125 through 300V DC. Provide a minimum of one (1) spare NO contact and one (1) spare NC contact in addition to any auxiliary contacts required.

Provide a mechanical interlock on reversing or multispeed contactors of the lever-type mechanism (with electrical contacts included) to prevent closing of one contactor when the other is closed.

Each unit door shall have an engraved acrylic nameplate, white with black lettering. A master nameplate shall be provided on each MCC lineup.

Wiring diagrams shall be provided at a centralized location in the MCC. Each modular unit shall also be supplied with wiring diagrams and product data. The diagram shall show the exact devices inside the unit and shall not be a generic diagram.

The entire MCC shall go through a quality inspection before shipment. This inspection will include:

- Physical Inspection of: structure, electrical conductors, including bussing, general wiring, and units.
- General electrical tests including power circuit phasing, control circuit wiring, instrument transformers, ground fault system, device electrical operation.
- AC dielectric tests of power circuits and control circuits.
- Markings/Labels verification, including instructional type, Underwriters Laboratory (UL), and inspector's stamps.
- The manufacturer shall use integral quality control checks throughout the manufacturing process to ensure that the MCC meets operating specifications.
- MCC shall be Cutler-Hammer Freedom & Advantage series, Square D Model 6 series, Allen-Bradley or Engineer approved equal.

Receptacles

All receptacles will be 20-ampere, 125-volt, three-wire, ground-fault-interrupting type, polarized, duplex, convenience outlets. Each receptacle will be a heat-resistant melamine body, flush or surface mounted in an outlet box, and will be provided with a waterproof cover plate. Provide in-use covers where applicable as provided by the NEC. Receptacles will be specification grade and manufactured by Hubbell, Arrow Hart or Leviton, or approved equal.

Raceways

Except for multi conductor, jacketed cables, all wiring shall be installed in conduit or stainless steel wireway as shown in the Plans.

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All conduits shall be standard weight, threaded, rigid steel conduit conforming to the requirements of ANSI Standard C80.1. All conduits shall be hot-dip galvanized, inside and out, to meet the requirements of the above standard for protective coating. Conduit couplings and fittings shall be made of malleable iron or steel, hot-dip galvanized.

All conduits installed not in earth or encased in concrete shall be plastic coated as hereinafter specified. Conduit fittings, including couplings, unions, elbows, expansion and deflection fittings, and other items, shall also be plastic coated. Conduits and fittings, which are to be plastic coated, shall be provided with a factory-applied polyvinyl chloride (PVC) coating in the following manner. The exterior of the galvanized rigid steel conduit or fitting shall be coated with an epoxy acrylic, heat-polymerizing adhesive not to exceed 0.1mm. A PVC plastic coating, 0.8mm to 1mm thick shall be bonded to the outside metal surface the full length of the pipe, except for the threads. The plastic coating shall have an 85+Shore A Durometer rating and conform to NEMA RNI-1998 (Type A), ASTM D746, and Federal Specifications LP406b, Method 2051, Amendment 1 or 25 September, 1952. A two-part red urethane, chemically cured coat shall be applied to the interior of all conduit and fittings. This internal coating shall be at the nominal 2-mil thickness and shall be sufficiently flexible to permit field bending without cracking or flaking. The Plasti-bond, PVC coated, hot-dip galvanized steel conduit shall be UL labeled and listed.

All hollow conduit and fittings, which serve as part of the raceway, shall be coated with the same exterior PVC coating and red interior urethane coating. The plastic exterior coating and the red interior urethane coating shall be factory applied by the same manufacturer who produces the hot-dip galvanized conduit. PVC coated conduit shall be installed in accordance with the manufacturer's installation manual.

Unions to connect sections of conduit that cannot be joined to each other or to boxes in the regular manner shall be of malleable iron or steel, hot-dip galvanized, PVC coated.

Conduits shall not be less than ¾ inch in diameter. The interior surfaces shall have a smooth finish and be free of burrs or projections, which might cause injury to the cables. All conduits shall be free from blisters, cracks, or injurious defects and shall be reamed at each end after being threaded. Sections shall be connected to each other with screw couplings made up so that the ends of both conduits will butt squarely against each other inside of the coupling. Conduits shall be installed to be continuous and watertight between boxes and equipment. Conduits shall be protected at all times from the entrance of water or other foreign matter by being well-plugged overnight or when the work is temporarily suspended.

Conduit bends and offsets shall be made by cold bending using approved methods and equipment. The use of a pipe tee or vise for bending conduit will not be permitted. Conduit, which has been crushed or in any way deformed, shall be discarded. All bends shall be long sweep, free from kinks, and of such easy curvatures as to permit the drawing of conductors without injury. Conduit runs shall be made with as few couplings as standard lengths will permit, and the total angle of all bends between any two boxes or cabinets shall not exceed 90 degrees, unless otherwise approved by the Engineer. The radius of curvature of pipe bends shall not be less than eight times the inside diameter of said conduit. Long running threads will not be permitted. Pull boxes shall be used whenever necessary to facilitate the installation of the wire.

Except for installation where specifically permitted by the Engineer, condulets or conduit bodies shall not be used for pulling conductors or for making turns in conduit runs or for branching conductors. Condulets or conduit bodies, where permitted, shall consist of malleable iron castings with gasketed covers of the same material and fastened with brass cover screws. The bodies shall be hot-dip galvanized, and PVC coated when used with PVC coated conduit.

Where conduits pass through the floors or walls of the houses, they shall be provided with PVC pipe sleeves for free passage of the conduits. After the conduits are installed, the openings shall be caulked with an elastic compound and escutcheon plates provided on the interior walls, ceilings, and floors.

Conduits and wireway shall be securely clamped and supported at intervals not exceeding five feet in length.

Conduit and wireway runs exposed on the steel structure shall be securely clamped to the steelwork. The conduit clamps, in general, shall consist of U-bolts attached to structural steel supports bolted to the members. The wireway clamps, in general, shall consist of manufacturer recommended stainless steel bracket hangers attached to structural steel supports bolted to the members. The wireway cover shall be on the top or on the side of the wireway and be clear of opening obstructions. The minimum thickness of the structural supports shall be 3/8 inch. Supports shall be arranged so that conduits and wireway rest on top of the support and conduit U-bolts rest on top of the conduits. The use of J-bolts to fasten structural supports or to clamp conduits will not be permitted.

All U-bolts and bracket hangers shall be provided with medium-series lock washers and hexagonal nuts. The bolts, nuts, and washers shall be of stainless steel conforming to the requirements of the Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes, ASTM Designation A276, Type 316.

Where conduits and wireways are to be mounted exposed on non-steel surfaces, they shall be securely clamped to the surface using bent plate pipe supports with back spacers held by not less than two bolts. The stock size for the bent steel plate supports shall be 6mm thick by 51mm wide. Back plates shall be of 10mm thick steel. Supports and spacers shall be hot-dip galvanized. Bolts shall be not less than ½" in diameter and shall be of stainless steel conforming to the requirements specified for U-bolts.

At any point where a conduit crosses an expansion joint longitudinally or where movement between adjacent sections of conduit can be expected, conduit expansion fittings shall be installed. The fittings shall be bronze expansion fittings and shall be provided with flexible bonding jumpers to maintain the electrical continuity across the joints. The fittings shall permit a total conduit movement of 203mm and shall be Engineer approved equal to the O.Z./Gedney Type EX, Spring City Type EF, or the Crouse-Hinds Type XJ.

At any point where a conduit crosses a joint laterally or where an offsetting type movement between adjacent sections of conduit can be expected, expansion and deflection fittings shall be installed. The fittings shall permit a movement of ¾" from the normal in any direction. The fittings shall be the O.Z./Gedney Type DX, Spring City Type EDF, Adalet Type STX, or Engineer approved equal.

Flexible conduits for the connections between the rigid conduit system, all motors, and limit switches shall be made with sections of PVC coated, flexible, metallic, liquid tight conduit. Each section shall not exceed 18" without prior approval of the Engineer.

All conduit embedded in concrete, insofar as possible, shall be completely encased by concrete of not less than 3 inches, measured in any direction, and shall be securely held in place during pouring and construction operations. A group of conduits terminating together shall be held in place by a template.

All conduit, wireway, and fittings shall be carefully examined before being installed, and all pieces having defects shall be set aside and removed from the site. All conduit bends shall be made with standard size conduit elbows. Conduit shall be assembled hand tight and then using strap wrenches tightened two more turns. Wrench marks or chuck marks shall be touched up with the appropriate touch-

up compound. All cuttings and threading shall be performed as recommended by the conduit manufacturer. All conduit, enclosures, and fittings shall be mechanically joined together to form a continuous electrical conductor to provide effective electrical continuity.

Ends of abandoned conduits, spare conduits/wireway, and empty conduits/wireway and stubs shall be capped during and after construction, and care shall be taken to ensure that no moisture or other matter is in or enters the conduits.

All conduits shall be pitched not less than 1" in ten feet (except by special permission). Where conduits cannot be drained to pull boxes, a drain "T" with drain fitting shall be installed at the low point and drained to a dry well of broken stone. Drain fittings shall be of stainless steel and shall be capable of passing 1 oz of water per minute.

The ends of all conduits projecting into boxes and equipment enclosures shall be provided with bronze insulated grounding bushings. The insulated portion shall be of molded phenolic compound, and each fitting shall have a screw type combination lug for bonding. Insulated bushings shall be the O.Z./Gedney Type RBLG, Spring City Type GB, or Engineer approved equal manufactured by Appleton. All bushings in any box or enclosure shall be bonded together with No. 8 AWG bare copper wire. Where conduit hubs are provided use locking nuts with grounding terminals.

All conduits and wireway shall be carefully cleaned both before and after installation. Upon completion of the conduit and box installation, the Contractor shall clear each conduit by snaking with a steel band, to which shall be attached an approved tube cleaner equipped with a mandrel of a diameter not less than 85 of the nominal inside diameter of the conduit and with a wire brush of the same diameter as the conduit, and shall then draw in the cables.

Both ends of each conduit or wireway run shall be provided with a brass tag having the same number stamped thereon in accordance with the conduit diagrams, and these tags shall be securely fastened to the conduit ends with No. 20 AWG brass wire.

Separate conduits or wireways shall be furnished and installed to carry the circuit wiring to all span driving motors.

All wireways shall be 16 gauge 304 stainless steel bodies with covers and oil-resistant gasket and adhesive. The flanges shall be 10-gauge stainless steel. Wireway fittings, nipples, and elbows shall be 304 stainless steel. A solid oil-resistant gasket shall be positioned between flanges when sections and fittings are bolted together.

Wireways shall not be less than 6" x 6". The seams shall be continuously welded and ground smooth. There shall be no holes or knockouts. The edges on all sections and fittings shall be smooth and rounded to prevent damage to cable and conductor insulation.

The wire way covers shall have heavy butt hinges and external screw clamps to assure complete seal between covers, gaskets, and bodies.

When wireway enters an enclosure, a box connector shall be used on the inside of the enclosure to ensure a tight and stable seal. Closure plates shall seal the end of wireway sections or runs.

At any point where a wireway crosses a joint, where an offsetting type movement between adjacent sections of conduit can be expected, or where movement between adjacent sections of conduit can be

expected flexible wireway fittings shall be installed. The fittings shall be the wireway manufacturer's recommended fitting.

All conduits projecting into boxes and equipment enclosures shall be provided with water tight, weather proof, insulated throat conduit hubs. The conduit hubs shall be approved equal to Meyers Watertight Rigid Conduit Hubs except for PVC coated conduit which shall be provided with PVC hubs of the same manufacture as the conduits.

Boxes
All surface mounted pull, junction, and terminal boxes shall be of type 316 stainless steel, and shall be provided with full length hinged gasketed, covers held with stainless steel fast operating clamps to provide NEMA 4X watertight construction. They shall be Engineer approved equal to the Hoffman bulletin A4S or equivalent by Weigman or Hammond.

Flush Mounted Boxes

All flush mounted pull, junction, and terminal boxes will be 316L stainless steel, and will be provided with gasketed, covers. Enclosure will have the following construction: body will be manufactured from 14gauge Type 316 stainless steel. Mounting flange manufactured from 10 gauge Type 316L stainless steel. Screw cover and hinged door manufactured from 12 gauge Type 316L stainless steel. Seams will be continuously welded and ground smooth. Type 316L stainless steel lift-off hinges will be used with hinged door. Enclosure will have Stainless steel quarter-turn latches used with hinged door. Enclosure will also feature a grounding stud on body and a bonding provision on cover or door. The boxes will be as manufactured by Hoffman Enclosures, Saginaw Enclosures, or the Hammond Manufacturing, or approved equal.

Flush Mounted Boxes (sidewalk or roadway)

All flush mounted pull, junction, and terminal boxes will be cast-iron, hot-dip galvanized inside and out, and will be provided with gasketed flat covers to provide NEMA-4X watertight construction, and AASHTO H-20 live load rated for full deliberate traffic. Covers shall be slip resistant. The boxes will be O.Z. Gedney Type YF, Spring City Type HP, Appleton Type WHF, except with stainless steel cover screws, or equal as approved by the Engineer.

Interior and exterior boxes shall be provided with external mounting lugs and shall be fastened in position with stainless steel through bolts. Conduit entries shall be means of galvanized malleable iron hubs. PVC coated conduit shall use PVC coated hubs. No box shall be drilled for more conduits or cables than actually enter it. Exterior boxes shall be provided with drain fittings of the same type as specified for conduit drains.

All boxes shall be sized in accordance with the requirements of the National Electrical Code and the dimensions as shown on the Plans.

Terminal boxes shall be of sufficient size to provide ample room for the terminal blocks and interior wiring and for the installation of conduit terminations and multi conductor cable fittings. Interior mounting backpanels with tapped holes shall be provided for mounting the terminal blocks.

Hardware and Supports
Supports for conduits, wireways, cables, boxes, cabinets, disconnect switches, small limit switches, and other separately mounted items of electrical equipment shall be fabricated from structural steel not less

than 3/8" thick. Clip angles and other supporting members, which are fabricated from structural steel plates and shapes and bolted to the structural members, shall be included with the structural steel. All other supporting members shall be included under the electrical work.

Structural steel brackets, boxes, and other equipment mounted on concrete surfaces shall be provided with a full neoprene gasket not less than 1/8 inch thick between the equipment and the surface of the concrete.

Expansion anchors for fastening equipment or brackets to concrete surfaces shall be wedge type anchor bolts, which shall be locked in place by an expansion wedge as the nut is tightened. All parts of the expansion anchors shall be of Type 303 stainless steel. Holes for the anchors shall be drilled to the size and depth recommended by the manufacturer using carbide tipped masonry drills.

Mounting bolts, nuts, washers, and other detail parts used for fastening boxes, disconnect switches, small limit switches, conduit clamps, cable supports, brackets, and other electrical equipment shall be of stainless steel conforming to the requirements of ASTM Designation A276, Type 316. Bolt heads and nuts shall be hexagonal and shall be provided with medium-series lock washers. Bolts smaller than ½" in diameter shall not be used, except as may be necessary to fit the mounting holes in small limit switches, boxes, and similar standard devices.

Usage of beam clamps for supporting conduits, boxes, or other equipment shall not be acceptable without prior approval of the Engineer.

Preformed metal framing channels, such as Kindorf, Unistrut, Superstrut, etc., where permitted by the engineer, will be of stainless steel.

Wiring and Cables

Except where otherwise noted, wiring in conduits shall be single-conductor.

All wires and their insulation and covering shall be of a nationally recognized brand, acceptable to the Engineer, and shall have marks always used on the particular brand for identifying it.

All wiring and cables shall conform to the requirements of NEMA Publication No. WC70-2000. Before wire and cable orders are placed with any manufacturer, the Contractor shall submit for approval typical published test data for the type of insulation proposed, showing that it meets the requirements of NEMA Publication No. WC7. All materials used to fabricate insulated wiring and cables shall be certified to be from stock not more than 1 year old.

All conductors shall be of stranded copper large enough to carry safely the maximum currents required without injurious heating or serious voltage drop. Conductors shall not be smaller than No. 12 AWG, except as approved for control panel and console wiring or for lighting fixtures. All conductors shall be soft-annealed copper wire conforming to the requirements of NEMA Publication No. WC70. All conductors shall have Class B concentric stranding, except for conductors in flexible cables.

The insulation shall be a chemically cross-linked, polyethylene compound conforming to the requirements of Part 3.7 of NEMA Publication No. WC70. The thickness of insulation shall be that required for 600 volts rated circuit voltage listed under Column A of Table 3-1. Insulation type shall be Type XHHW-2.

Equipment ground conductors shall be bare, stranded, coated copper conforming to the requirements of NEMA Publication No. WC70, Part 2.

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Single conductor wiring, including the insulating material, shall be tested to demonstrate that it meets specified requirements. The testing shall be done as stipulated in NEMA Publication No. WC70, Part 6. Wiring and cables shall not be shipped from the plant of the manufacturer until certified test reports on the cable properties have been approved by the Engineer.

The conductor sizes and number of wires shown on the Plans are the minimum permissible. The Contractor shall provide wiring and cables of sufficient size and number as may be required for the installation in accordance with the wiring diagrams on his approved working drawings. In each conduit and multi conductor cable containing ten or more conductors, at least one spare wire shall be provided for every ten conductors actually used.

Wiring shall not be installed in any conduit before all joints are made up tightly and the conduits rigidly secured in place. The drawing of cables into conduits shall be done without injury to the wires or their insulation or covering. No lubricant of any kind shall be used for the pulling of wires, unless specifically authorized by the Engineer. Sufficient slack shall be left in all cables to permit proper connections in boxes, cabinets, and enclosures.

Both ends of every single length of conductor shall be permanently and clearly tagged in accordance with the same numbers or designations appearing on the approved wiring diagrams. Wire tags for marking the conductors shall be heavy duty, heat shrink, waterproof, permanently marked, and resistant to ultraviolet light deterioration. Numbers and letters shall be black or blue on a white background. The Contractor shall submit the proposed wire marking system and a sample of the wire markers to be installed to the Engineer for approval. Each conductor, except for control and instrument conductors, shall be color coded with colored insulation. Color coding for 120/208 volt conductors shall be black for phase A or 1, red for phase B or 2, blue for phase C or 3, white for neutral, and green for equipment ground. Color coding for three phase 480 volt conductors shall be brown for phase A or 1, purple for phase B or 2, yellow for phase C or 3, gray for neutral, and green for equipment ground. Each conductor shall be marked at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection and shall include each branch circuit or feeder and control wire.

Conductors inside terminal boxes, the control console, and control panels shall be neatly formed into cables and laced with approved cable ties, with the individual conductors leaving the cable at their respective terminal points. These conductors shall be looped to allow not less than three inches of free conductor when disconnected. The formed cables shall be held securely away from the terminals and from contact with the enclosure by means of approved insulating supports.

All outgoing wires, No. 8 AWG or smaller, in the control console and control panels and in terminal boxes shall be connected to stud and nut style terminal blocks. Terminals shall be suitable for use with solderless, locking fork, wire connectors. Connectors which extend beyond the ends of terminal block barriers, shall be furnished with an insulating sleeve covering the metal part of the connector. Taping of extended terminals will not be permitted.

Each terminal of all terminal blocks shall be permanently marked to show the same number or designation as appears on the wire connected thereto.

Splicing of wires will not be permitted. Wherever it becomes necessary to joint or branch conductors, terminal blocks shall be used, and wires shall be clearly tagged.

Multi conductor cables supported on the steelwork shall be secured thereto by bent plate cable clamps spaced not more than 3 ft on centers. The cable clamps shall be fabricated from stainless steel plates bent

to suit the cables' outside diameters. In general, the clamps shall be fastened to structural brackets bolted to the steelwork.

Where multi conductor cables enter the control console or any cabinets or boxes, they shall be provided with watertight cable terminators. Each cable terminator shall provide a watertight seal by compressing a tapered neoprene-sealing ring around the outer jacket of the cable. Cable terminator parts shall be made of bronze and shall be approved equal to the Series SF-327OB Watertight Cable Entrance Seals as made by O.Z./Gedney.

The Contractor shall take insulation resistance readings on all circuits installed, with electronic equipment disconnected, and furnish to the Engineer a complete record of the results obtained. These circuits shall include connected motors when tested. Conductors rated 600 volts, or more, shall be one hundred (100) megohms, or more. Defective circuits shall be replaced at the Contractor's expense.

Flexible cable for specified connections shall be rubber-insulated, multiple-conductor portable cords conforming to the requirements of NEMA Pub. No. WC3, Part 7.7 or NEMA Pub. No. WC8, Part 7.4 for hard service. Each cable shall be provided with a heavy-duty neoprene jacket conforming to the requirements NEMA Pub. No. WC3, Part 7.7.5.1 or NEMA Pub. No. WC8, Part 7.4.5.1. Flexible cables shall conform to the National Electrical Code, Article 400 for hard service. Flexible cables shall be provided with strain relief fittings and basket weave cable grips at each end. Strain relief fittings shall be malleable iron, liquid tight strain relief fittings. The cable grips shall be stainless steel, heavy long, closed wire mesh, single weave with a double eye support. All mounting hardware shall be stainless steel.

Submarine Cables are covered under a separate specification.

Pier Protection and Swing Span Navigation Lights
Navigation lights shall be provided in accordance with the rules and regulations of the United States Coast Guard as shown on the Plans.

For all navigation lights, the doors and lenses shall be gasketed, and each entire unit shall be completely weatherproof and vandal resistant. Fittings shall be non-corroding, and the sockets shall be of porcelain mounted on shock absorbers. The housings for all units shall be cast-bronze, and an LED 120-volt lamp with brass base shall be installed in each socket.

The swing span lights shall be controlled by the fully open limit switches so that the green lights shall show when span is fully opened, and the red lights shall show at all other times.

All navigation lights shall be equipped with bronze junction boxes.

The housing shall be of cast bronze and shall be suitable for marine environment. Construction shall be rain-tight and fully gasketed. The light assembly shall be designed for heavy duty, long life service. Design shall provide ready access for lamp service.

The lens shall be heat-resistant fresnel glass. Lens sections shall be 180 degrees red over 180 degrees green. Inside lens diameter shall measure approximately 7 inches. Outside lens diameter shall measure approximately 8 inches.

Base shall be cast of the same material as the fixture head. Light assembly shall mount via four 1/2" diameter bolts through the base, provided by installer to suit installation. A junction box shall be provided at the base of the unit. A cast junction box with gasketed access cover shall be provided. Junction box

shall be of the same material as the fixture assembly and shall match the navigation light base footprint. Orientation of junction box shall be capable of rotation in 90 degree increments.

The pier protection lights shall be model PL as manufactured by B&B Roadway or approved equal by Tidewater or Fed Transit. The Swing span lights shall be model SS as manufactured by B&B Roadway or approved equal by Tidewater or Fed Transit.

The navigation light system shall be controlled by photoelectric control device. The photoelectric control unit shall be a completely self-contained, weatherproof device rated 1,800 VA at 120 volts and shall be provided with a time-delay feature and a deluxe, encapsulated lightning arrestor for protection against surges and lightning. The unit shall provide turn-on of the pier navigation lighting system at 10.74-lux nominal. The unit shall be suitable for operation within a temperature range of -50 degrees Celsius to 70 degrees Celsius and shall have a fail-safe feature so that the lighting load remains energized in the event of component failure. The unit shall be suitable for installation in a twist lock receptacle with adapter for mounting on PVC-coated rigid metal conduit. Locate the photoelectric controller on the machinery house, as approved by the Engineer.

A three-position selector switch shall be provided on the control console for operating the rest pier navigation lights. In the "Auto" position, the lights shall be controlled by the photoelectric control device. The "On" position shall override the photocell and turn the lights on. The lights can be turned to the off position for safety during maintenance.

Traffic Gates

The gates shall be explicitly designed for traffic control on movable bridges as described in AASHTO's current Standard Specifications for Movable Highway Bridges, HOV and reversible lanes and similar applications. They shall be provided with both roadway and sidewalk/pedestrian arms.

The operating mechanism and main control components shall be contained in a weatherproof housing. The housing shall be constructed of .188" (4.8mm) carbon steel, hot dip galvanized after fabrication. Exterior surfaces shall be painted aluminum. All fasteners shall be corrosion resistant. Arm shaft openings shall incorporate O-ring seals.

Front and rear access doors shall be mounted on full cross bronze straps. Hinges shall be of the slip-off type and shall have stainless steel pins. Door latches, two per door, shall use a vise action to compress a neoprene bulb-type gasket to seal the door openings. All maintenance and repairs shall be conducted and all interior components shall be accessible from the sidewalk side of the housing only.

The gate shall be fixed to the foundation using four 3/4" (20mm) diameter minimum anchor bolts. The gate housing base shall provide four 1.00" (25mm) holes on a 20 1/4" (514mm) square pattern.

The traffic gate arm shall be 4" (102mm) square, 6005-T5 aluminum extruded tubing. Stainless steel truss cables and a damping type bumper rod shall be furnished with longer arms at the discretion of the manufacturer. Front and rear arm surfaces shall be covered with alternating red and white high intensity reflective sheeting. Stripes shall be 16" (152mm) wide, and vertical according to MUTCD. Remaining exposed surfaces shall be painted white.

The gate shall be provided with a sidewalk arm. The arms shall be of fiberglass, sized by the manufacturer. Front and rear arm surfaces shall be covered with alternating red and white high intensity reflective sheeting. Stripes shall be 16" (152mm) wide, and vertical according to MUTCD. Remaining exposed surfaces shall be painted white.

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The warning lights shall be used as a traffic signaling light to mark and draw attention to the traffic gate. The housing shall be of high impact plastic. Assembly shall be double- faced. Light assembly shall be mounted to warning gate arm using an aluminum adapter plate. Lenses shall be red fresnel plastic, approximately 4" diameter. Lamp shall be 12V 100,000 hour LED lamp.

The arm base shall be designed with a shear pin mechanism to minimize damage to the gate and vehicle in the event of a collision. In the event of an impact, the shear pin shall break, allowing the arm to swing approximately 75 to 80 degrees. At the full open position, a spring-loaded latch shall engage, preventing the arm from swinging back into traffic. Arm shall be easily reset by manually releasing the latch, rotating the arm back into position and replacing the shear pin.

A pair of carbon steel channels, hot dip galvanized, painted aluminum, shall be rigidly affixed to the ends of the main arm shaft. The channels and a steel crossmember shall provide a sturdy mount for the arm, arm base assembly and counterweights. They shall be shortened as required so that the channels do not extend past the curbline.

At the rear end of the side arm channels, hot dip galvanized counterweights shall be mounted to balance the arm. Counterweights shall be sectional and shall permit at least 10% adjustment.

The main arm shaft shall be of 2" (51mm) diameter AISI 4150 with a minimum tensile strength of 140,000 psi. The shaft shall be mounted in heavy duty relubricable ball bearings.

The warning arm shall pivot in the vertical plane via a mechanical 4-bar linkage. The linkage shall utilize cranks keyed to the main arm shaft and transmission shaft and an adjustable connecting rod between a pair of self-aligning spherical rod ends. The connecting rod shall be of 1" (25mm) diameter AISI 4150. The linkage shall be driven by a fully enclosed, double reduction, worm gear speed reducer. Gear ratio used shall produce an operation time of 11 seconds. The velocity of the arm shall follow a sinusoidal pattern to provide smooth operation. The arm shall begin and end its full motion path with zero velocity and accelerate smoothly to maximum velocity at mid-travel.

The motor shall be 1 hp, 480 VAC, three phase, 60 hz. The motor shall be a C-face design and shall be mounted directly to the transmission. The motor shall be instantly reversing, and overload protected.

The motor shall be equipped with a solenoid-release, automatic brake. The brake shall have a manual release lever to permit manual operation of the gate during emergencies or setup.

A handcrank shall be provided with each gate to facilitate manual operation of the gate.

The gate limit switch assembly shall be a self-contained unit. The assembly shall provide 8 independent SPDT control switches. Switches shall be rated for 15 amps at 480 VAC. Switches shall be controlled by individually adjustable cams. The limit switch assembly design shall permit adjustment of all cams with the gate in any position. The limit switch assembly shall have a removable cover to help prevent accidental contact with switch terminals. Shaft, cams, bushings and housing pieces shall be of non-ferrous corrosion resistant materials.

A manual disconnect switch shall be provided, pre-wired at the factory to break the main motor leads, to protect personnel during service. A handcrank safety switch shall be provided to prevent powered actuation of the gate during manual operation. Door safety switches shall be installed and set at the factory to break the control circuit when either access door is opened. Door safety switches shall have a

pull-to-override feature for test operation and shall automatically reset when doors are closed. Control components and terminal blocks shall be mounted inside an electrical enclosure mounted facing the rear side access opening. Pressure-type, modular terminal blocks shall be fully labeled and clearly coded to the control system vendor wiring diagrams. All control wiring shall be clearly coded to wiring diagrams and shall terminate at the terminal block. Connections to screw-type terminals shall have lugs. Conductors shall be type XHHW #14 AWG stranded, minimum.

Each traffic gate shall have a pedestrian gate arm. The pedestrian gate arm length shall be determined in the field. The pedestrian gate arm shall operate with the traffic gate arm.

The traffic gates shall be Model VW-4, as manufactured by B&B Roadway, or engineer approved equal.

Warning Gongs

A warning gong shall be attached to each of the oncoming traffic gate housings.

The housing shall be of heavy duty, cast aluminum construction. Gong assembly shall be equipped with an aluminum mounting adapter for mounting to the top of warning gate housing. Mounting shall be designed to enclose all wiring. A hinged and gasketed rear door shall provide service access. A cast aluminum guard above the shell shall provide weather protection. Gong shall produce a sound level of 90db at 10 feet. Gong shall operate on 120V power at a current draw of .45 FLA. The gong shell shall be spun silicon bronze.

The warning gong shall be approved equal to the B&B Roadway G12.

Barrier Gates

The barrier shall be designed for use as a penetration resistance barrier. The gates shall be explicitly designed for traffic control on movable bridges as described in AASHTO's current Standard Specifications for Movable Highway Bridges, HOV and reversible lanes and similar applications.

The barrier beam shall be fabricated from 12" square, .375" thick structural steel tube, hit dip galvanized after fabrication. Height to the top of the beam shall be as shown on the drawings. Traffic side of beam shall have 6" diameter wing type heavy dock bumpers sloped at 45 degrees down and away from the pintle and covered with engineering grade reflective sheeting. Beam face between bumpers shall also be covered with reflective sheeting to produce an alternating pattern of red and white stripes.

Nominal length of the beam shall be measured from the pivot to the far end of the beam.

Enclosed within an integral housing, near the far end, shall be a tractor unit which shall drive the barrier. The tractor unit shall consist of wheels, wheel drive mechanism, motor, brake, and gear reducer coupled directly to the motor. Design shall permit manual operation during emergency conditions and for convenience during installation.

Motor horsepower shall be determined by the manufacturer to suit the installation, but shall not be less than 2 HP.

Wheels shall have a minimum capacity of 120% of the load at the wheels. Wheel tread shall be of urethane elastomer or similar material to provide traction. Wheel shaft shall be AISI 4150 with a minimum tensile strength of 140,000 psi. The shaft shall be mounted in heavy duty relubricated ball bearings.

The warning lights shall be used as a traffic signaling light to mark and draw attention to the traffic gate. The housing shall be of high impact plastic. Assembly shall be double- faced. Light assembly shall be mounted to warning gate arm using an aluminum adapter plate. Lenses shall be red fresnel plastic, approximately 4" diameter. Lamp shall be 12V 100,000 hour LED lamp.

The barrier shall be fixed at the pivot to a suitable foundation. Anchor bolt size and pattern shall be determined based on installation details and requirements.

The barrier shall be equipped with passive endlocks at the far end of the barrier. The endlocks shall engage with the opposing barrier.

Access panels or doors shall be located to permit servicing of all equipment. Access openings shall be designed to provide a weather resistant enclosure for equipment. All fasteners shall be corrosion resistant.

The pivot shaft shall turn on self-lubricating bronze radial and thrust bearings.

The barrier limit switch assembly shall be a self-contained unit. The assembly shall provide 8 independent SPDT control switches. Switches shall be rated for 15 amps at 460 VC. Switches shall be controlled by individually adjustable cams. The limit switch assembly shall permit adjustment of all cams with the barrier in any position. The limit switch assembly shall have a removable cover to help prevent accidental contact with switch terminals. Shaft, cams, bushings and housing pieces shall be of non-ferrous corrosion resistant materials.

A manual disconnect switch shall be provided, pre-wired at the factory to break the main motor leads, to protect personnel during service. A handcrank safety switch shall be provided to prevent powered actuation of the gate during manual operation. Door safety switches shall be installed and set at the factory to break the control circuit when either access door is opened. Door safety switches shall have a pull-to- override feature for test operation and shall automatically reset when doors are closed. Control components and terminal blocks shall be mounted inside an electrical enclosure mounted facing the rear side access opening. Pressure-type, modular terminal blocks shall be fully labeled and clearly coded to the control system vendor wiring diagrams. All control wiring shall be clearly coded to wiring diagrams and shall terminate at the terminal block. Connections to screw-type terminals shall have lugs. Conductors shall be type XHHW #14 AWG stranded, minimum.

The barrier gates shall be Model HR-7, as manufactured by B&B Roadway, or engineer approved equal.

Flasher

The flasher shall be moisture and corrosion resistant and shall be capable of dissipating heat sufficient for continuous duty. The flasher shall have two alternately flashing circuits, and one steady burn circuit. Each flashing circuit shall flash .50 seconds on and .50 seconds off. The input voltage shall be 120VAC. A 120V/12V transformer shall provide 12V for the flasher and the arm lights. The flasher shall operate properly for input voltages within 10% of nominal. The output circuits shall be rated at 10 amps at 12VAC each (10 amps total load). A voltage drop of up to .5 volts to the output terminals shall be acceptable. It shall have a built-in, internal overload protection with auto-reset. Terminals shall be clearly labeled and shall be compression type screw terminals.

CCTV System

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The Closed Circuit Television System (CCTV) shall consist of ten (10) PTZ, capable closed-circuit television cameras, power supplies, fiber optic/ethernet switches, ethernet/fiber optic switch power supplies, camera power supplies, multimode fiber, camera processors and DVR, and monitors. In addition, two identical cameras shall be provided as spares for the system. The cameras shall be monitored at the Control House by two 42", color, general purpose monitors, mounted as shown on the Plans. The intent is to provide a dedicated view of each camera on quad screens on the monitors and capability of accessing the CCTV via web-based client from a remote location. Initial system will be setup to show far side camera views on monitor 1 and the near side camera views to monitor 2.
All apparatus and equipment comprising the CCTV system, including camera, lens, housings, controls, monitors, and rack mounting equipment and all associated appurtenances required to provide a complete functioning system, shall be manufactured or furnished by a single qualified system vendor.

The system shall be capable of two (2) week minimum recording duration.

The CCTV system vendor shall have a demonstrable competence in providing complete functioning systems. Such competence shall be demonstrated by identifying a minimum of three outdoor/indoor functioning CCTV systems in the past 5 years.

The CCTV system vendor shall assume complete system responsibility for the integrated functioning of all components to provide a satisfactory assembled system operating in accordance with specified requirements. The CCTV system vendor shall be responsible for the detailed design of the total system to ensure compatibility of equipment and suitability for the intended system functioning. The vendor shall provide supervisory assistance in the installation of equipment to ensure maximum reliability and ease of maintenance. The vendor shall provide on-call warranty service for a period of 1 year upon final acceptance of the bridge.
The CCTV system will be capable of remote viewing and operation through the CCTV system software remote client. The systems will have industry standard level of security and system encryption such that no unauthorized access is allowed.

All equipment shall be compatible with Genetec Omnicast Surveillance Suite software.
Contractor shall provide a minimum of 1 license for the Genetec Omnicast Surveillance suite software for the local CCTV equipment.

Cameras:
Cameras will be IP type and will be all 316 stainless steel construction, rated for outdoor applications, NEMA 4X rated, 30x optical zoom, 24VAC rated, and be furnished with a blower, sun shield, and heater added options. In addition, two identical cameras will be provided as spares for the system. Camera will be able to operate between -40 Deg C and 60 Deg C. All camera mounting hardware will be furnished with the camera and produced by the same manufacturer as the camera. The camera will be able to pan, tilt, zoom through the use of the same manufacture joystick control accessories. Cameras will be supplied with on board SDs with the highest possible memory allowed by the model camera.
Each camera will be approved equal to Stainless Steel Spectra Enhanced Series IP PTZ dome camera with the environmental package.

Camera PTZ Controller:
The CCTV system will be provided with the camera manufacturer recommended PTZ controller station.

DVR:
Digital Video Recorder/processor will be capable of supporting 128 IP cameras and 64 Analog Cameras. The DVR will be supplied with 4TB of internal storage. All necessary software will be provided to establish a complete system.

DVR will be approved equal to the Pelco DSSRV2.

Power Supplies:
Power to the cameras will be provided through local outdoor rated 4 output – 120VAC to 24VAC, 20A rated power supplies as shown on plans. Contractor will submit for review and approval final location of power supplies.
Power supplies will be approved equal to Pelco WCS4-20 4 output power supply.

The CCTV system will also consist of video monitors and CCTV Communication Equipment Cabinet.

a) Video Monitors - The cameras will be monitored at the Control House by two 42", color LED, full-high definition, 1920x1080 resolution minimum, video surveillance monitors. Monitors will be with the CCTV cameras and mounted using manufacturer recommended ceiling mount and as shown on the Plans. Monitor at a minimum will have 1 VGA, 1 BNC, and 4 HDMI inputs.

b) CCTV Communication Equipment Cabinet

    a. CCTV racks will be provided as required to mount all necessary CCTV equipment in the Control House including but not limited to: video signal receivers, camera processors, DVR/HVR, UPS, and cooling fans.

    b. CCTV Rack will be a UL Listed pivoting rack such that the mounted rack units can be swiveled out 90 Degrees and access to the rear connectors can be granted. Rack will accommodate 40 spaces minimum and be constructed of 16-gauge steel.

UPS:
Rack mounted UPS will be provided and will be capable of providing power instantaneously to the CCTV system upon power failure. UPS will be capable of powering CCTV equipment for a minimum of 1 hour.

CCTV Racks:
CCTV racks will be provided as required to mount all necessary CCTV equipment including but not limited to: NVR, UPS, and cooling fans.

Cable:
Video signal cable will fiber and industrial ethernet CAT6 cable.
Fiber optic cable will be 12 strand outdoor heavy duty rated jacket 62.5/125 multimode fiber.

Programming:
All equipment programming will be recorded and included in the operating manual.

Fiber Optic Cable

The cable shall be OM5 type single mode fiber optic cable. It shall be 24 strand and LC connectors shall be used for all terminations.

Roadway Lights

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The decorative post top lantern shall be an architectural luminaire that consists of luminaire housing, a prismatic optic and a decorative cover. The optical assembly shall be a type 3 acrylic refractor to precisely distribute light with excellent visual comfort and reduced glare. The programmable LED driver shall include 0-10V dimming. The driver life shall be rated to at least 100,000 hours.

The luminaire housing and decorative cover shall have a spike finial and be made of low copper cast aluminum and finished with corrosion resistant super durable powder coat green paint. Multi-stage pre-treating and painting process shall yield a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber (operated per ASTM B117). The luminaire shall include an integral slipfitter that accepts a tenon.

The luminaire shall be type JFE Jefferson Gen 3 LED Post Top by Holophane, JFE3 P10 30K AL3, with P10 performance package, 3000K, 70 CRI and type 3 acrylic refractor. Green 4" tapered poles shall be mounted as shown in the plans.

Service Lighting

Service light fixtures shall be ceiling or wall mount RAB Vaporproof Fixtures, die cast aluminum, with all brass hardware and clear heat resistant glass globes. The fixture shall be supplied with a junction box and mounting lugs. One piece die cast aluminum guards shall be threaded for secure fit. Fixture shall be UL listed for use with 90 degree Celsius supply wiring for use in wet locations. Fixture shall have a high temperature silicone internal gasket. The porcelain socket shall have 150 degree Celsius 8" long leads included. An adapter plate shall be included with ceiling fixtures.

Marine Radio

1. The marine radio telephone for installation in the control house will be a limited coast station for monitoring and communicating with marine traffic. It will be designed to transmit on Channel 13 (156.650 MHZ) and monitor Channel 16 (156.800 MHZ). It will have a normal power output of 1 watt and maximum power of 10 watts.
2. The unit will be coupled to a stainless steel or fiberglass whip antenna of 1.0 meter in length. Coax type surge suppressors will be installed where the antenna leads enter the Control House.
3. The marine will be furnished complete with all appurtenances required for proper operation, including power supply, external speaker, hand-held microphone, outdoor antenna, interconnecting cables, brackets, plugs, connectors, adapters, and other equipment. The unit must comply with FCC rules and regulations.

Spare Parts
Supply spare parts in accordance with AASHTO requirements and Contract Plans. The spare parts supplied for each bridge shall include, but not be limited to, the following:

- Six fuses of each kind and size installed.
- 4 limit switch or proximity switch of each type specified. In addition, a full set of contacts and contacts fingers for each type of limit switch
- A set of contacts and contact fingers for each unit or fractional unit of five or less of each kind or size installed, including contactors and starters. For units that do not incorporate replaceable contacts, furnish a complete unit with coil.
- One coil for every five or less of each size relay, contactor, and motor starter installed.

- One complete relay timer, time delay relay, contactor, and starter for each unit or fractional unit of five or less of each kind and size installed.
- Two intelligent overload relays of each size installed.
- One spare Auxiliary motor
- For the motor brakes:
  - 1 spare thrustor complete with heater and motor.
  - 1 limit switches for hand-release mechanism.
  - 1 limit switches - brake released.
  - 1 limit switches - brake set.
- For the traffic gates:
  - 1 complete roadway gate arm with lights prewired
  - 1 complete pedestrian arm
  - 1 rotary cam limit switch
  - 4 arm lamp assemblies
- For the navigation lights:
  - 1 each color and type lens.
  - 2 each color and type LED lamp.
  - 6 lens gaskets.
- For the PLC system:
  - 1 each of every type PLC input card and PLC output card.
  - In addition, a quantity of 4 discrete input cards and 4 relay contact output cards.
  - 1 PLC chassis power supply module.
  - One control switch contact unit of each type installed.
  - 1 fully programmed HMI unit
- For each drive provided:
  - 3 incoming line fuses
  - 3 control power fuses

Arrange the spare parts in uniform size cartons of substantial construction, with typed and clearly varnished labels to indicate their contents and store them where directed by the Engineer. Provide large spare parts with moisture-proof wrapping. Provide a directory of permanent type, describing the parts. In the directory state the name of each part, the manufacturer's number thereof, and the rating of the device for which the part is a spare. Mark the spare parts to correspond with their respective item numbers as indicated on the elementary wiring diagram.

Voltage and Arc Flash Warning Labels

Furnish and install warning labels to identify the equipment or panel operating voltage and arc flash warnings. The arc flash warning will be in accordance with NEC 110.16., National Fire Protection Association (NFPA) 70E 'Standard for Electrical Safety in the Workplace' and the Institute for Electrical and Electronic Engineers (IEEE) 1584 'IEEE Guide for Performing Arc Flash Hazard Calculations.' The approved labels will be printed on weather resistant vinyl labels and installed on the equipment.

CONSTRUCTION DETAILS

General

The cost of removal of existing items, as shown on plans, or if items are replaced as called out in this specification, shall be included in the bid price of this item.

Grounding

Bridge steel work on each side of the navigation channels shall be solidly bonded and grounded to 25mm copper plated steel ground rods installed using No. 2/0 AWG bare, stranded, tinned copper cable.

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The resistance to ground shall be no higher than 5 ohms. Provide exothermic welds, molded fusion, type as required, as manufactured by Cadweld, Thermoweld, Metalweld, or Engineer approved equal.

Bond together and solidly connect to a ground bus in the machinery and/or electrical rooms grounding conductors in submarine cable, navigation lighting units, all metal framing, cases, and enclosures of the electrical equipment, such as motors, control console, control cabinets, conduits, submarine cable armor (stripped of its jacket prior to clamping), and all other metal parts in the proximity of current carrying conductors or equipment. Extend a No. 2/0 AWG bridge-grounding conductor connected to this ground bus to the service disconnect via submarine cable.

Ground new utility service neutral conductors in accordance with local utility grounding requirements.

Exothermically weld together the utility service neutral conductor, the bridge grounding conductor and two No. 2/0 AWG grounding electrode conductors.

Ground the submarine cable armor where applicable. The armor wires' individual jackets must be stripped before the submarine cables are clamped in order to provide an adequate connection to the conduit system.

Provide grounding system terminals that are solderless lugs and that are secured by means of hexagonal-head, copper plated, steel machine bolts with lock washers or lock nuts. Ground system conductors shall be continuous unspliced connections between terminal lugs. Remove paint, rust, and scale over the contact area. Make up all connections as tightly as possible, and spot paint any bare metal or paint undercoat remaining exposed to restore the surface with the same coating and number of coats as applied to the adjacent metal.

Provide equipment ground conductors composed of seven-strand, soft-drawn, bare, tinned copper wire conforming to ASTM B33 and not smaller than No. 10 AWG.

Painting
The requirements for painting structural steel also apply to painting electrical equipment, unless otherwise specified.

Shop Painting

Electrical equipment such as conduits, boxes, supports, and other devices which have a galvanized finish and equipment such as motors, brakes, control console, and control panel frames and enclosures which normally are given a factory finish need not be shop painted. Give all other electrical equipment one shop coat.

Field Painting

Electrical equipment, which is normally given a factory painted finish suitable to the Engineer, need not be field painted. Give all other electrical equipment, such as conduits, boxes, device enclosures, supporting clips and brackets, and other devices, two field coats of paint as specified under the requirements for painting structural steel. Before applying the two field coats, clean galvanized surfaces free of all grease, oil, dirt, and foreign material and etch with copper sulfate solution, after which the solution shall be applied. In lieu of etching and a coat of shop paint, the Contractor may use galvanizing primer as a first coat for galvanized surfaces. Apply a final field coat on electrical equipment in the operator house the color and type of paint to match the house interior.

Motor Testing

Main Span Drive and Auxiliary Motors

1. Prior to shipment, Span Drive motors will be factory tested according to all routine motor manufacturer tests plus any tests required to be performed such that all applicable fields of the IEEE STD 112 Form Annex C and any additional information as required by this specification can be filled with appropriate data. A complete speed-torque-current curve will be developed for each motor ranging from 0% speed to 100% speed. All critical curve points will be indicated including but not limited to, locked rotor torque, pull up torque, breakdown torque, and full load torque. Motor will be subjected to a complete full load heat run/winding temperature rise test for stator and rotor and will be performed in accordance to NEMA MG-1 and IEEE STD 112.

2. Once the Main span drive motor has completed the above testing, the motor will be coupled to the actual Flux vector drive which is to be used with the motor after final installation. All necessary equipment including but not limited to dynamic braking resistors, encoder, and cabling will be provided for testing. Motor-drive system will progress through the following load testing and will be performed in the "Heavy Duty Mode" of the drive:

    a. 150% FLT for 30 seconds at 0% speed

    b. 100% FLT for 30 seconds at 0% speed

    c. 100% FLT for 30 seconds at 25% speed

    d. 50% FLT for 30 seconds at 25% speed

    e. 0% FLT for 30 seconds at 25% speed

    f. 100% FLT for 30 seconds at 50% speed

    g. 50% FLT for 30 seconds at 50% speed

    h. 0% FLT for 30 seconds at 50% speed

    i. 100% FLT for 30 seconds at 75% speed

    j. 50% FLT for 30 seconds at 75% speed

    k. 0% FLT for 30 seconds at 75% speed

    l. 100% FLT for 30 seconds at 100% speed

    m. 50% FLT for 30 seconds at 100% speed

    n. 0% FLT for 30 seconds at 100% speed

Similar motor testing shall be testing for overhauling.

3. Input voltage to the drive, input current to the drive, input line frequency to the drive, three phase motor current, motor voltage frequency, three phase motor voltage, motor torque, and motor speed will be tabulated for each step of the above test and submitted for review and approval.

4. Contractor will coordinate all the testing requirements with the motor manufacturer and will include the cost of all the above testing in the bid price.

5. All the above testing will be performed in the presence of Westchester County DPW authorized representative and test results will be submitted for review and approval prior to shipment of equipment from the factory.

CCTV

All brackets, housings, anchors, inserts, recessed ceiling mountings etc., for the CCTV monitors and Communication Enclosure Cabinet will be installed and connected in accordance with manufacturer's recommendations.

All CCTV wiring will be installed in separate conduits. The Contractor will provide the appropriate conductors/fibers for the cameras in the submarine cables.

To prevent electrolytic action and corrosion due to the mating of dissimilar metals, a 7/16-inch-thick neoprene gasket will be furnished and installed between the camera mounting brackets and steel as required elsewhere.

The following views will be required to be displayed on the two 42" monitors in order to aid the operator in operating the bridge, the contractor will provide all cabling and programming required to place these views on the screens:

Up River

Down River

Near Gates

Far Warning/Barrier Gates

Near traffic signals

Far Traffic signals

Parking plaza

Fiber Optic Cable

Cable shall be run from the far side submarine cable cabinet to the County Administration Building. The remainder of the cable shall be coiled in an underground pull box for future use and connection by the County. The pull box size shall be governed by the fiber optic cable listed permitted curve.

Service Lighting

Provide service lighting at the three (3) locations shown in the plans. Extend the lighting power from the nearest existing unit.

Marine Radio

The marine radio will be located as shown in the Contract Plans.

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PLC Programming and Sequence of Operation

The following is a general sequence of operation based on the general requirements of AASHTO. During the shop drawing submittal process the operating sequence shall be further refined with input from the Engineer and the County.

Step 1: Turn bridge control power on, which enables desk controls. Turn oncoming traffic signals from green, through yellow, to red.

Step 2: Energize the gate flashers and gongs. Lower the traffic gates. If a gate takes longer than 30 seconds to lower, the operation shall stop and an alarm shall be sent to the HMI. If a gate is lowered but does not provide lowered indication the traffic gates bypass shall permit operations to continue. The operation of the bypass switch shall cause an alarm to be sent to the HMI.

Step 3: Close the barrier gates. If a gate takes longer than 30 seconds to close, the operation shall stop and an alarm shall be sent to the HMI. If a gate is closed but does not provide closed indication the barrier gates bypass shall permit operations to continue. The operation of the bypass switch shall cause an alarm to be sent to the HMI.

Step 4: Confirm that with all gates closed the barrier gate latched limit switches are engaged. The barrier gate bypass shall permit the operation to continue. The operation of the bypass switch shall cause an alarm to be sent to the HMI.

Step 5: Withdraw the span locks. If a lock takes longer than 30 seconds to withdraw, the operation shall stop and an alarm shall be sent to the HMI. If the span lock motor operating current exceeds a preset value, to be field determined, an alarm shall be sent to the HMI, but operations shall continue. If the span lock withdrawn limit switches fail to register, the span lock bypass switch shall allow the operation to continue, and an alarm shall be sent to the HMI.

Step 6: If there is a static drive fault, or a circuit breaker is not closed, the operation shall stop, and an alarm shall be sent to the HMI. If any brake is hand released, the operation shall not continue ,and an alarm shall be sent to the HMI. One brake hand release shall be permitted, and an alarm shall be sent to the HMI. Initiate span open by momentarily turning the selector switch to open. The drive shall smoothly ramp to 5% speed at 100% torque with the brakes still set. The system shall verify that the motor shaft is not turning. If the motor shaft turns, the operation shall stop, and an alarm shall be sent to the HMI. If the shaft is not turning, the brakes shall release, and the drive shall ramp the motor to 100% speed. If after 10 seconds the brakes do not release, the operation shall cease and an alarm shall be sent to the HMI.

Step 7: Once the span reaches the nearly open position (to be field determined) the drive shall ramp down to and remain at 10% speed until the span reaches fully open. The drive output torque shall be limited to 80%, the brakes shall set and then the drives shall shut down. An independent electronic speed switch shall verify deceleration and shall emergency stop the span if deceleration does not occur. Should deceleration failure occur, an alarm shall be sent to the HMI. If the time to open the span exceeds 120 seconds, the operation shall stop and an alarm shall be sent to the HMI.

Step 8: Allow navigation traffic to clear.

Step 9: Initiate span close by momentarily turning the selector switch to close. The drive shall smoothly ramp to 5% speed at 100% torque with the brakes still set. The system shall verify that the motor shaft is not turning. If the motor shaft turns the operation shall stop and an alarm shall be sent to the HMI. If the

shaft is not turning, the brakes shall release and the drive shall ramp the motors to 100% speed. If after 10 seconds the brakes do not release, the operation shall cease and an alarm shall be sent to the HMI.

Step 10: Once the span reaches the nearly closed position (to be field determined) the drive shall ramp down to and remain at 10% speed until the span closes. The drive output torque shall be limited to 80%, the brakes shall set and then the drives shall shut down. An independent electronic speed switch shall verify deceleration and shall emergency stop the span if deceleration does not occur. Should deceleration failure occur, an alarm shall be sent to the HMI. If the time to close the span exceeds 120 seconds, the operation shall stop, and an alarm shall be sent to the HMI.

Step 11: Drive the span locks. If a lock takes longer than 30 seconds to drive, the operation shall stop, and an alarm shall be sent to the HMI. If the span locks driven limit switches fail to register, the span locks bypass switch shall allow the operation to continue and an alarm shall be sent to the HMI.

Step 12: Open the barrier gates. If the barrier gates are open, but the proper indications are not given, the barrier gate bypass switch shall allow the traffic gates to raise and alarm shall be sent to the HMI. If a gate takes longer than 30 seconds to open the operation shall stop and an alarm shall be sent to the HMI.

Step 13: Raise the traffic gates. If a gate takes longer than 30 seconds to raise the operation shall stop and an alarm shall be sent to the HMI. Both the barrier and traffic gate flashers and the traffic gate gongs de-energize.

Step 14: Turn traffic signals to green. Turn bridge control power off and desk controls are disabled.

In general, any drive fault, any bypass switch, any overtime fault, or any manual operation interlock fault shall send a fault to the HMI, which shall display a message unique to that fault. The vendor shall submit a complete list of proposed fault messages for review and comment and additional messages shall be added as required at no additional costs to the County. These messages shall be recorded in order with the time and date of the fault. Many operations can be bypassed; only one bypass switch can be enabled at any time, if more than one is enabled, the operation shall stop.

HMI Screens:

The control system vendor shall develop the screens for the HMI. At minimum, there shall be:

- a screen that shows the status of the complete bridge
- a screen for gates showing status and all alarms and faults
- a screen for span drives and motors showing status and all alarms and faults
- a screen showing a schematic layout of the bridge electrical machinery with icons that change colors based on status
- a screen showing the PLC and communications architecture showing any communications faults
- screens for alarms and alarm history
- screens showing the recorded parameters for the last five bridge operations
- screens showing the status of all PLC I/O

Additional screens may be added during shop drawing review and shop and field testing, and shall be provided at no additional cost to the County.

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CCTV System

The Contractor shall arrange the monitors to provide optimum viewing of screens considering the operator and size of the operator's room. The Contractor's plan for monitor mounting must be approved by the Engineer before furnishing or installing any of the CCTV equipment. The Contractor shall provide any additional framing required to mount the monitors above the control console in the operator's room.

The Contractor shall ensure video signal integrity against loss or attenuation and provide clean roll-free switching. Provide amplifiers or ground loop correctors, as required, at no additional cost to the County.

Video signal cable shall be splice-free, 75 ohm coaxial, 95 percent copper braid shield, copper center conductor, 100 percent sweep tested from 5-300 MHZ, Type RG-59/U. No splices are permitted, except connections inside terminal cabinets for cameras mounted off of the swing span.

Manufacturer's Field Start-Up Service
Included with the furnishing of the major items of electrical equipment by the manufacturer is the furnishing of all necessary field supervisory start-up time by the manufacturer's Service Engineering Department to facilitate proper adjustment of the drive equipment so as to achieve satisfactory functioning of the drives.

The manufacturer's field service engineering personnel are required to be experienced in the adjustment and functioning of the particular control equipment furnished by the manufacturer. The personnel are required to be capable of locating and correcting faults or defects and of obtaining from the manufacturer, without delay, new parts or replacements for apparatus that, in the opinion of the Engineer, does not perform satisfactorily.

Bridge Operator
Provide persons to supervise the operation of the bridges and to train personnel for a period of 30 consecutive working days after the construction of the permanent control system has been completed, fine-tuned, field tested, and utilized for span operations. Instructors include, but not be limited to, representatives from manufacturers of the major equipment and a Control Engineer.

Provide operators who are skilled persons competent to operate the bridge and who are completely familiar with the operating equipment of the bridge and its auxiliaries, such as bridge security, the communications system, and fire alarm system. The operators are required to be able to make any adjustments required to the electrical and mechanical equipment.

During the 30-day period specified above, the operator(s) is required to be in attendance at the bridge for the normal working period of 8 hours per day.

Included in the 30-day training and instruction period, provide on-site training of electricians, maintenance workers, and other personnel as indicated by the County on subjects such as troubleshooting, repair of electronic motor controls, drive circuit logic, maintenance and adjustment of all electrical equipment, software, PLC hardware, and other items required for full bridge operation and maintenance. Devote three 8-hour sessions to hardware and maintenance related topics. In addition, devote three 8-hour sessions to software requirements. Offer instruction pertaining to hardware and maintenance on two separate occasions to allow bridge personnel to coordinate the course with their normal activities. Devote one 8-hour session to training on the fire, security, and communications systems and equipment. Furnish all necessary instruction sheets, student training aids, books, paper, and booklets to supplement training. Submit to the State, a minimum of 2 weeks prior to training session, an outline of topics to be covered and training material for review. It is the Contractor's responsibility to coordinate with the State the

location where training sessions will be held. Supplying of visual aid equipment and other miscellaneous items required for training shall be the responsibility of the Contractor.

The Contractor shall make the instruction booklet that was specified above, "Operation and Maintenance Manual, Volume 1, Operation of Electrical Equipment", available for use during the training period.

Training of the designated bridge operational personnel shall commence three (3) weeks prior to the official bridge opening date. This will allow training of personnel without interruption of normal traffic flow.

Arc Flash Calculation And Labeling

The Contractor will provide a complete arc flash risk assessment of the electrical system, based upon the equipment selected by the Contractor, performed in accordance with the National Fire Protection Association (NFPA) 70E 'Standard for Electrical Safety in the Workplace' and the Institute for Electrical and Electronic Engineers (IEEE) 1584 'IEEE Guide for Performing Arc Flash Hazard Calculations.' The panels will include all electrical distribution panels operating at a voltage greater than 50V powered downstream from the 150KVA Transformer in the service building. The Contractor will submit the report and proposed Arc Flash Warning Labels for review and comment. The approved labels will be printed on weather resistant vinyl labels and installed on the equipment. The assessment will include details on all time current curves of the equipment chosen.

METHOD OF MEASUREMENT

The work will not be measured for payment.

Basis of Payment
The lump sum price bid for "Electrical and Control System Work" includes the cost of all labor, materials, operation and maintenance manuals, training, and equipment necessary for a complete installation, ready for operation as well as the removal and lawful disposal of the existing equipment being replaced/removed.

Submit to the Engineer a detailed breakdown of the Contractor's costs under this item within 30 days of award of the contract. This breakdown will be evaluated by the Engineer and utilized as the basis for monthly progress payments for work satisfactorily completed. A minimum of ten-percent of the bid will be retained by the State until final acceptance of the bridge electrical system, the Contractor and Control System Vendor have completed all items on their punchlists, and all aspects of bridge operation, operator and maintenance personnel testing, training, and control are complete. An additional five-percent will be retained until final approval of the operation and maintenance manuals is granted by the Engineer.

Pay Item	Pay Unit
599.063000WE Bridge Electrical and Control System	LS

599.064000WE MOVABLE BRIDGE ELECTRICAL TESTING

DESCRIPTION

Under this item, the Contractor shall furnish all labor, materials, plant, and equipment; and he shall do all work necessary, such as adjustments or corrective measures, to properly test all systems included in the field testing and final acceptance testing.

Field Testing

The Contractor shall arrange for and provide all the necessary field tests, as directed by the Engineer, to demonstrate that the entire electrical system is in proper working order and in accordance with the Plans and Specifications. The tests shall include, but not be limited to continuity and insulation resistance testing of multi conductor cables and operational testing of traffic signals, warning gates, barrier gates, bascule leave (in all modes), navigation lights and signals, generator, automatic transfer switch, HVAC, sump pumps, and street lighting. He shall arrange with the local power company to obtain, at his own expense, electric power during the testing period until the bridge has been accepted.

Should the tests show that any piece of equipment or cable or wiring connection, in the judgement of the Engineer, is defective or functions improperly, such adjustments and/or replacements shall be made by the Contractor as to make the installation satisfactory to the Engineer and at no extra cost.

During testing of the electrical systems, it may be found that minor deviations from the performance specification are required for optimum bridge operation. All hardware and software required for these modifications shall be included in the control system vendor scope of work at no additional cost to the County.

The bridge field tests are intended to confirm each major sub-component acceptance factory tests, and that the subsystem is operational, as well as the complete system. Confirmation of correct operation of sub-components will be demonstrated through successful operation of the particular component. However, the Contractor is still responsible for the factory acceptance tests as required per contract specifications. Examples of subsystems are the span drive systems, control and power wiring, limit switches, starters, PLC system, span lock system, traffic control system, etc.

During the field testing period, the Contractor shall arrange to have at the site representatives of the manufacturer of all major pieces of equipment or systems. The representatives shall be capable of supervising all adjustments to the equipment; of locating faults or defects and correcting them if possible; and of obtaining from the manufacturers, without delay, new parts or replacements for apparatus which, in the opinion of the Engineer, does not perform satisfactorily.

Bridge Final Acceptance Testing

This acceptance test is intended to show and/or demonstrate that the normal programmable logic controller (PLC), back-up and emergency control and power systems are operational, trouble free, operating with all interlocks properly functioning, and in compliance with the requirements of the contract plans and specifications.

The bridge acceptance tests are not intended to substitute each sub-component acceptance factory and field tests. Confirmation of correct operation of sub-components will be demonstrated through successful operation of the total control system. However, the Contractor is still responsible for the factory and field tests acceptance tests as required per contract specifications. For example, it is not the intent to manually operate

and test each limit switch. This will have been accomplished by the contractor prior to demonstration of the system under test. The contractor shall be able to prove that the results of the sub-component tests are in conformance with the contract plans and specifications. The recommended values of various device parameters can be found in the appropriate manufacturer's catalog cuts and instruction manuals. Correct operation of the sub-components, PLC program and control circuit wiring connections will be verified through the successful completion of the entire bridge control and power systems tests.

During testing of the electrical systems, it may be found that minor deviations from the performance specification are required for optimum bridge operation. All hardware and software required for these modifications shall be included in the control system vendor scope of work at no additional cost to the County.

This testing procedure will evaluate performance and confirm correct and proper operation of all major subsystems and devices including the control desk meters, control switches and pushbuttons, PLC system, traffic signals, warning gates, barrier gates, span locks, brakes, the span drives and motors, bypass switches, generator, auto transfer switch, etc. Visual inspections and physical measurements of some equipment are required for the purpose of recording valid parameter values. PLC bridge run printouts shall be provided for each test, and kept for the record together with all other recorded data.
The County must be in possession of the final, new operating and maintenance (O & M) manuals at least 30 days before acceptance testing may begin and in accordance with and incentive or penalties that may be applicable. The Contractor shall start approval submissions of the O & M manuals as soon as possible, as several revisions may be required.

There shall be 30 consecutive days of nominal bridge operation using the new permanent systems, with a minimum of five (5) openings per day, before the final acceptance test shall be scheduled.

MATERIALS

None specified.

FINAL ACCEPTANCE TESTING

Equipment Required For Final Acceptance Testing

The testing of the bridge electrical equipment would necessitate the use of the following recording and testing devices:

- Lap-Top Computer with pre-installed PLC software and attached portable printer to connect, program and download PLC programs
- Recording Ammeter/Voltmeter
- Power Factor Readout/Watt Recorder
- Portable Tachometer
- Portable Ohmmeter
- Amp-probe
- Infrared Scanner.
- Measuring Tape
- Stop Watch (Timer)
- All other necessary instrumentation and tools to monitor, adjust or replace items during the bridge testing procedure

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Final Acceptance Test Data

All test results, parameters, data specified herein to be recorded shall reference the appropriate paragraph number and shall be presented in legible, tabular format, listing associated parameters and conditions. For example, motor current shall reference speed (rpm), span leaf angle (degrees), raise or lower mode, PLC or manual drive control, drive control selector position number, etc. The PLC data logging printouts shall be in the required format as per Item "Movable Bridge Electrical and Control System."

The results of the Normal, Back-Up and Emergency systems tests shall be presented in a matrix form on an Inspection Report Data Sheet. The proposed format of these sheets shall be submitted to the Engineer for acceptance prior to the actual testing. Any parameter value, which falls beyond the recommended range, would require the readjustment or replacement of the defective device.

The table of the test results shall have references to the specific sections of the testing procedure. The precision of the results will depend on the accuracy of recording equipment, the observer and weather conditions. For each stage of testing of the bridge control equipment, the name of the person who will perform the test, instruments used with calibration data if required, the exact date, time and weather conditions shall be recorded.

Some devices such as the transfer switch, PLC status, lamps, console indicator lights, brake function indicator lights, differential/emergency clutches, console controlled lighting, horn, can be easily tested without performing any bridge opening operation.

The bridge main parameters shall also be observed on the laptop screen, and visually compared to the control desk indicating meters. Any discrepancy between results should be recorded. A discrepancy between critical measurements like span angle indication shall be resolved prior to continuing the tests.

The testing shall be accomplished sequentially, following the bridge operation instructions for normal operation and emergency operation. The major bridge systems shall be monitored while the bridge operates. All PLC monitored parameters shall be downloaded to the laptop computer and printed. The printout original shall be kept for future reference, and a printout copy shall be attached to the Operating and Maintenance (O & M) Manual for reference. Another printout copy shall be provided to the Engineer.

Final Acceptance Testing Requirements

Results and observations shall be carefully recorded throughout the various tests.

The bridge shall be balanced and strain gage conditions verified by the Contractor prior to any operational acceptance testing of the bascule span control system.

Prior to performance of these tests, all temporary bypasses, jumpers, switches, etc., installed during any previous testing must be removed. The control circuits shall be in the state presented in the originally As-Built control wiring diagrams (restored to normal).

All tests and verifications shall be for equipment at both the span leave. In addition to all above listed devices, both PLCs, VFDs and all associated input devices should also be tested.

599.064000WE MOVABLE BRIDGE ELECTRICAL TESTING

Tests To Be Performed

PLC System

General

The bridge primary control system is provided by the PLC. All major control components are directly connected to the PLC input cards, and the control desk HMI monitor information is provided via PLC standard analog outputs. Prior to any other test, visually verify the wiring connection integrity of the major components including:

- All encoder devices
- All limit switches
- Control cabinets contactors, VFD drive input boards
- All resolvers
- Speed switches
- Traffic signals, barrier and warning gates, interlocked heating and ventilating devices, etc.
- Control desk indicating lights
- I/O fuses
- Control desk HMI monitor and provides correct indications.

PLC Standby CPU Test

- Verify that the standby CPU is plugged-in and operational.
- Disconnect or temporarily disable the primary CPU.
- Manually switch the PLC to "Standby CPU".
- Verify that all PLC functions have been transferred to the standby CPU.
- Verify messaging on the laptop screen and on the printout
- Re-install and re-energize the primary CPU card, and manually switch back to the primary CPU.
- Verify that the PLC system functions correctly.

PLC Functional Tests

1. Verify that the PLC UPS is in normal operation
2. Disconnect power from the PLC rack and monitor the voltage on the PLC supply
3. After 2 minutes on UPS power, reconnect to the UPS and verify the PLC operation.

PLC Messaging and Monitoring Functions

Verify that all specified messages are actually displayed on the HMI monitor triggered by correct event (open fuse, brake hand released, etc.) as described in the specifications. A preliminary check should prove that the PLC is recording on-line the operational parameters to be further used in tests (power, position indication, etc.).

Relay System

The bridge secondary control system is through relay controls. The relay controls operate the Auxiliary motor and basic interlocks.

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All tests from the main PLC system that are applicable for the relay system shall also be performed.

Control Desk

The control desk devices (switches, pilot lights, HMI monitor) will be used throughout the tests, and all irregularities observed shall be noted during and after the tests from the notes and printouts. A special attention shall be given to the PLC driven HMI monitor accuracy verification.

Provide one HMI monitor wattmeter and one HMI monitor ammeter verification as follows:

For a determined bridge span opening, at an exactly start recording [Time stamp] time, an assigned test technician shall record every 5 seconds, on paper, the meter watt and ampere readings for a designated drive and motor.

The manually recorded values shall be filed together with the PLC printout of the same stored bridge run. The results shall be compared and the meter accuracy estimated.

Span Brakes Function and Status Indication

- The normal automatic set and released operation of the brakes shall be visually recorded during the span raise and lower operations.
- The brakes shall be hand released, each brake one at a time, and the hand-released indication monitored through the PLC inputs.
- With the span in non-permissive operation mode (span locks driven, drives not energized), the brake set and release switches can be activated manually and their set/released indication monitored on the control desk.

Closed Circuit TV (CCTV)

The test consists of:

- Turning on the monitors and cameras.
- Verification of the viewing angles of the CCTV cameras.
- The camera and monitor provide a clear, sharp image under high and low light conditions.
- Confirming all recording devices are operational
- Confirming all remote logins and controls are operational

Air Horns

Test that the air horn produces a tone acceptable to the Engineer. If necessary, the air horn sound tone shall be re-tuned to an acceptable pitch and level.

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Traffic Signals Control

Test that the traffic signals change state upon activation of the desk selector switch. The duration time of the amber light shall be of an acceptable time to the Engineer. If necessary, the TSR timing relay shall be re-set to an acceptable time delay.

Warning Gates Control

Testing of the gates shall demonstrate the balance condition of the gate arms such that a stationery arm remains in the same position when the brake is released. Proper manual operation and proper normal operation upon activation of the desk selector switch shall be demonstrated.

1. Lower individually, group raise commands, lower/raise sequencing checks
2. Follow the "Sequence of Operation".
3. Verify that the warning gates are lowered in the right sequence and the gongs de-activated at the appropriate time.
4. Group open the barrier gates and verify that they are fully open.

Interlock checks:

- Set the "Sequence of Operation" to first step.
- Verify that manually moving any gate from its fully raised position shall turn on the red traffic signals, warning lights, and gongs.
- Verify that the warning gates cannot be operated electrically unless "Stop" traffic signals has been turned on, the barrier gates are open.
- Verify that the span leaf cannot be operated electrically.

Bypass checks:

Verify that when the "Bypass Warning Gate Interlocks" keyswitch is enabled, the interlocks listed above are overridden.

Group / Individual Control Operation Interlocks

Verify that when all warning gates are raised using the group raise control switch, any of the following conditions:

- Gate housing door opened;
- Handcrank inserted;
- Gate motor disconnect switch opened;
- Gate motor overloaded;

on any of the warning gates, will stop warning gates group raise operation. Verify that even if any of the above conditions is cleared, the group raise operation is still permanently canceled.

Verify that any individual warning gate raise/lower operation on that warning gate is disabled by any of the above conditions.

Barrier Gates Control

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1. Close individually, group open commands, close/open sequencing checks
2. Follow the "Sequence of Operation".
3. Verify that the barrier gates are closed in the right sequence and the gongs de-activated at the appropriate time.
4. Group open the barrier gates and verify that they are fully open.

Interlock checks:

- Set the "Sequence of Operation" to first step.
- Verify that manually moving any gate from its fully open position shall turn on the red traffic signals, warning lights, and gongs.
- Verify that the barrier gates cannot be operated electrically unless "Stop" traffic signals have been turned on, the warning gates are down.
- Verify that the span leaf cannot be operated electrically.

Bypass checks:

Verify that when the "Bypass Barrier Gate Interlocks" keyswitch is enabled, the interlocks listed above are overridden.

Group / Individual Control Operation Interlocks

Verify that when all barrier gates are opened or closed using the group open/close control switch, any of the following conditions:

- Gate housing door opened;
- Handcrank inserted;
- Gate motor disconnect switch opened;
- Gate motor overloaded;

on any of the barrier gates, will stop barrier gates group open/close operation. Verify that even if any of the above conditions is cleared, the group open (or close) operation is still permanently canceled.

Verify that any individual barrier gate open/close operation on that barrier gate is disabled by any of the above conditions.

Span Locks Control

Drive/pull commands:

1. Follow the "Sequence of Operation" up to the span operation.
2. Pull locks using the control desk marked-up corresponding switch, and verify the locks are pulled.
3. Drive back locks using the control desk marked-up corresponding switch, and verify the locks are driven.

Interlock checks:

- Verify that the barrier gates cannot be opened and warning gates cannot be raised electrically unless the span locks are driven.
- Verify that the traffic signals cannot be turned to green.
- Verify that the span leaf cannot be operated electrically unless the span locks are pulled.

Bypass checks:

Verify that when the "Bypass Span Locks Interlocks" keyswitch is enabled, the interlocks listed above are overridden.

Control Operation Interlocks

Verify that when the span locks are operated by the drive/pull control switch, any of the following conditions:

- Manual handcrank inserted;
- Lock motor disconnect switch opened;
- Lock motor overloaded;

on any of the span locks, will disable the drive/pull operation.

Span Brakes Control

- The normal automatic set and released operation of to the brakes shall be visually recorded during to the span raise and lower operations.
- The brakes shall be hand released, each brake one at a time, and to the hand-released indication monitored through to the PLC inputs.
- With the span in non-permissive operation mode (span locks driven, drives not energized), to the brake set and release switches can be activated manually and their set/released indication monitored on the control desk.

Generator

- Operate the bridge on generator power a minimum of 5 consecutive times.
- Confirm all fuel gauges are operational
- Confirm that the ATS can turn on the generator, as well as manually turn on the generator from the control desk selector switch
- Confirm that the loadbank and its associated controls are appropriately operating.
- Confirm that generator output voltage and current are appropriate and comparable to the utility.

Span Normal Operation

Several bridge openings may be required to demonstrate that all the operational parameters are acceptable and interlock functions safe. Subsequent runs will be required to simulate PLC and communication failures, and to test interlocking and bypass functions. The normal sequence of operation as described in

the "Sequence of Operation" section of the general specifications shall be followed up to the indicated operational step of the equipment to be tested.

Span Reduced Speed

1. Set the span drive speed to "Reduced" from the control desk.
2. Follow the full "Sequence of Operation". During the span leaf "Raise" and "Lower" operation, the following parameters shall be monitored and manually recorded:
   (a) span leave angular position [degrees];
   (b) drive power [kilowatt]
   (c) Maximum height during the "Raise" [degrees];
   (d) Raise" time and "Lower" time;
3. These parameters shall be recorded at the fully seated, nearly closed, nearly open and fully open position as indicated at the control desk by the span limit switches. The PLC data printout shall also be provided for a direct readings checkout.
4. Verify that the span operated normally within the permissible position limits, and without any automatic position control changeover to a back-up system.
5. Verify that the recorded encoder angles, the control desk indicated position and the limit switches indicated position are equal or within the set design tolerances.

Span Full Speed

1. Set the span drive speed to "Full" from the control desk.
2. Follow the full "Sequence of Operation". During the bascule span "Raise" and "Lower" operation, the following parameters shall be monitored and manually recorded:
   (a) span leaf angular position [degrees];
   (b) drive power [kilowatt]
   (c) Maximum angle during the "Raise" [degrees];
   (d) Raise" time and "Lower" time;
3. These parameters shall be recorded at the fully seated, nearly closed, nearly open and fully open position as indicated at the control desk by the span limit switches. The PLC data printout shall also be provided for a direct readings checkout.
4. Verify that the bascule span operated normally within the permissible position limits, and without any automatic position control changeover to a back-up system.
5. Verify that the recorded encoder angles, the control desk indicated position and the limit switches indicated position are equal or within the set design tolerances.

Normal Stop

1. Set the span speed to "Normal" from the control desk.
2. With the span running at full speed during a "Raise" operation, press the "Stop Span" pushbutton. The span should slow and stop smoothly within a minimum of 3 to 5 seconds deceleration.
3. Repeat the test during a "Lower" operation.

Emergency Span Stop

599.064000WE MOVABLE BRIDGE ELECTRICAL TESTING

This test should be conducted such as to minimize the mechanical stresses on the bridge systems. It is suggested to be conducted only once during a span raise, and once during a span lowering, under reduced speed condition.

1. Under a "Reduced Speed" normal opening procedure, push the "Emergency Stop" red mushroom head button.
2. Verify that all motor and brake contactors drop out and the span brakes set immediately.

Overspeed Fault Detection Test

Simulate an overspeed condition from the overspeed relay (HOS) by manually changing the state of the corresponding PLC input during a normal span opening, at full speed. Verify that the span stops and the HMI monitor displays the overspeed failure message.

Deceleration Failure Test

A. Reduced Speed To Creep Speed Stage

Simulate an overspeed condition from overspeed relay by manually changing the state of the corresponding PLC input during a reduced speed span deceleration at the nearly seated position. Verify that the span E-stops (Emergency-Stops) and the HMI monitor displays deceleration failure message.

B. Full Speed to Reduced Speed Stage

Simulate an overspeed condition by temporarily changing the MOS (medium overspeed) internal PLC program parameter during a full speed to reduced speed deceleration stage. Verify that the span E-stops, and the HMI monitor displays the deceleration failure message.

Interlock Checks

1. Verify that the span cannot be operated electrically if more than one brake in machinery room has been released by hand.
2. Verify that the barrier gates, warning gates, traffic signals cannot be operated unless the span is seated and locked.
3. Verify that the span locks cannot be operated unless the span is fully seated.

Bypass Checks

Verify that when the "Bypass Span Control Interlocks" switch is enabled, the interlocks listed above are overridden.

Span Auxiliary Operation

Several bridge openings may be required to demonstrate that all the operational parameters are acceptable and interlock functions safe. The normal sequence of operation as described in the "Sequence of Operation" section of the general specifications shall be followed up to the indicated operational step of the equipment to be tested.

2. Follow the full "Auxiliary Sequence of Operation". During the bascule span "Raise" and "Lower" operation, the following parameters shall be monitored and manually recorded:
   (a) span leaf angular position [degrees];
   (b) motor power [kilowatt]
   (c) Maximum angle during the "Raise" [degrees];
   (d) Raise" time and "Lower" time;

3. These parameters shall be recorded at the fully seated, nearly closed, nearly open and fully open position as indicated at the control desk by the span limit switches. The PLC data printout shall also be provided for a direct readings checkout.
4. Verify that the bascule span operated normally within the permissible position limits.
5. Verify that the recorded encoder angles, the control desk indicated position and the limit switches indicated position are equal or within the set design tolerances.

Normal Stop

1. With the span running at full speed during a "Raise" operation, press the "Stop Span" pushbutton.
2. Repeat the test during a "Lower" operation.

Back-Up Systems

General

The back-up systems are designed to replace the primary subsystems in a normal bridge operation. A normal operation is considered when the PLC is enabled and controls all the bridge traffic and span functions with no need to bypass interlocks. The PLC shall be enabled and operational during the back-up systems test. All bypass switches shall be turned off.

Span Back-Up Systems

Back-Up Span Motor and Drive: Select alternately "Main A" and "Main B" system for the span leaf. Verify that the chosen drive and motor are correctly selected and de-selected.

Auxiliary Span Motor: Select "Aux" system for the span leaf. Verify that the main drives and motors are disabled.

Method of Measurement

Payment for the Item "Movable Bridge Electrical Testing" shall be made on a lump sum basis.

Basis of Payment

The lump sum bid for "Movable Bridge Electrical Testing" shall include the cost of all labor, materials, and equipment necessary to complete the installation, ready for operation.

The Contractor shall submit to the Engineer a detailed breakdown of his costs under this item within 30 days of award of the contract. This breakdown shall be evaluated by the Engineer and be utilized as the basis for monthly progress payments for work satisfactorily completed. A minimum of ten-percent of the bid will be retained by the County until final acceptance of the bridge electrical system, the Contractor and Control System Vendor have completed all items on their punch lists, the final O & M manuals have been approved and accepted by the Engineer, and all aspects of bridge operation and control are complete.

ITEM 599.142500WE MOVBLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS

DESCRIPTION

Work Included: This Section specifies the requirements for providing all labor, materials, tools, and equipment, and performing all operations necessary for Submarine Cable, HDPE Ducts, and Hardware indicated on the Contract Drawings and specified herein.

The work includes providing submarine cables and submarine cable ducts, and providing and installing submarine cable conduits at the rest piers, armor clamps, bell ends, cable terminators, brackets, supports, and any other equipment required to complete the submarine cable installation as well as the on-site services of the cable manufacturer's representative.

The work to install the submarine cables and HDPE Ducts is under pay item Submarine Cable and HDPE Duct Installation.

Quality Assurance

Regulatory Requirements:

New York Department of Environmental Protection (NYDEP)

Materials and construction shall conform to the requirements of the current National Electrical Code and to any applicable local rules and ordinances. The Contractor shall obtain any required permits and approvals of all Departments or Agencies having jurisdiction.

The Contractor shall obtain any required permits and approvals of all Departments or Agencies having jurisdiction. All work shall be in conformance with the requirements of the United States Coast Guard and the local environmental conservation agency.

Submittals

Submarine Cable

The Contractor shall submit to the Engineer seven (7) certified copies of all the factory test data for approval before accepting shipment of cable from the manufacturer. The test data shall include, in tabulated form, a description of the material undergoing test, a description of each test performed, the measured or observed results, and the value and limits required by the ICEA/NEMA Standard for acceptance.

The Contractor shall submit to the Engineer seven (7) copies of a statement certifying that the cable delivered for use under this Contract has passed the required factory inspections and tests and complies with all the requirements, including materials and construction, of the Standards and Specifications in the Contract.

Typical published test data providing the physical and electrical characteristics of the proposed cable-insulating compound.

Shop Drawings

ITEM 599.142500WE MOVBLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS

The Contractor shall prepare and submit to the Engineer for approval the following working drawings executed in accordance with the provisions of the Contract regarding the Submarine Cables:

Manufacturer's construction drawings of all submarine cables showing the sizes of conductors, type and thickness of insulation, makeup of the cable layers, type and size of jackets, armor, and the outer diameters of the finished cables. Additionally, maximum bend radius and pulling tensions shall be shown.

Detail drawings showing the construction of the submarine cable terminal boxes and cabinets and all equipment and components mounted therein. Terminal tagging must be shown prior to cable installation. Cabinet mounting details and cabinet arrangements shall be included.

Conduit Duct

Typical published test data providing the physical and electrical characteristics of the proposed HDPE ducts.

The Contractor shall provide calculations for both HDPE duct size and wall thickness to the Engineer for approval.

MATERIALS

Submarine Cables

The submarine cables shall be obtained from a manufacturer that is experienced in producing submarine cable. Before cable orders are placed with any manufacturer, the Contractor shall determine the true length of each cable between the submarine cable terminal cabinets. Splicing or joining of conductors between these points shall not be permitted. In addition, the Contractor shall verify the conductor count of each cable with the vendor of the bridge control system to ensure a minimum of 15-percent of the specified number of each size of conductors are spare conductors.

The Contractor shall be responsible for ascertaining and procuring the correct continuous length of submarine cables, including sufficient excess length to accommodate pulling eyes, adequate slack for submarine cable settling, cable clamping, connections, and for test samples.

The Contractor shall be responsible for ascertaining and ordering the correct conductor counts based on his approved working drawings supplied by the control system vendor. In no case, shall the conductor counts be less than those shown on the drawings.

Materials and construction of the submarine cables shall conform to all applicable and referenced standards of NEMA WC70 / ICEA S-95-658, latest revision, UL Standard 44, NFPA 70 / NEC latest revision, and all local codes under jurisdiction.

All conductors shall be annealed uncoated copper to meet ASTM B-3, stranded to meet ASTM B-8, class B stranding, and ICEA S-95-658, NEMA WC70.

The insulation of each conductor shall be a moisture-resisting, cross-linked polyethylene (XLPE) compound conforming to the requirements of NEMA WC70 / ICEA S-95-658. The insulation shall meet accelerated water absorption per Electrical Method EM-60. Insulation thickness shall be minimum 25 mils for conductor size 22 - 16 AWG, 45 mils for conductor size 14 - 9 AWG, 55 mils for conductor size 8 - 2 AWG, 65 mils for conductor size 1 - 4/0 AWG, 75 mils for conductor size 225 - 500 KCMIL and 90 mils for conductor size 525 - 1000 KCMIL, be rated no less than 2000 V for conductor size 14AWG or larger, 600V for conductor size smaller than 14AWG. The insulation shall incorporate non-carbon fillers to inhibit treeing.

In each cable, the insulated conductors shall be cabled to a full circular section using non-hygroscopic fillers, where necessary, to fill out the section. Each layer of the conductors shall be covered with a single covering of moisture-resistant binder tape, lay length and directions conforming to ICEA S-95-658, NEMA WC70.

Inner jacket shall be weather and UV-resistant high density polyethylene (HDPE) per ICEA S-95-658, NEMA WC70. Jacket thickness varies per cable diameter; and shall be as shown on Contract Plans.

Submarine cable number of conductors, layer and jacket thickness and material shall be as detailed on the Contract Plans.

Conductors in each layer shall be identified by coloring or marking the outer surface of the insulation. Over the cabled conductors, there shall be applied one layer of binder tape followed by a homogeneous synthetic sheath. Over the sheath, there shall be applied cable armor consisting of a single layer of galvanized steel wire, each wire covered with a layer of polyethylene as per ICEA S-95-658, NEMA WC70. A high-density polyethylene (HDPE) jacket shall be placed over the armor. The HDPE jacket shall be sunlight and weather resistant. Any variations in cable construction or materials from these Specifications and shown Contract Plans cross-sectional details shall be submitted to the Engineer for review and approval.

Approved moisture-resistant filler material suitable for submarine cable application shall be used in the interstices between and over the insulated conductors to give the complete cable a circular cross-section.

Binder tape of approved, suitable, flame-resistant, and moisture-resistant fabric material with a thickness not less than 10 mils shall be applied over the multi conductor/filler assembly and overlapped not less than 10 percent of its width between turns.

Packaging of the finished cable shall be on suitable non-returnable reels capable of supporting the weight during shipping and handling.

The fiber optic cable within the bridge controls submarine cables shall be composed of 62.5/125/250 micrometer multimode individual fibers and the fiber optic cable within the submarine cable dedicated for the WCDPW networking system shall be 9/125 micrometer single mode fiber, encased in gel filled loose tubes, cabled, a central strength member, water swellable tape, aramid fiber strength member, and a polypropylene jacket.

Hardware

The clamp fitting for supporting each submarine cable at the top end of its pier shall be a type FS armored cable support and as shown on plans. The clamp assembly shall be fabricated of hot dipped galvanized steel, and made specifically for this use. All hardware shall be of stainless steel conforming to the requirements of ASTM Designation A276, Type 316. Bolt heads and nuts shall be hexagonal, and shall be provided with medium series lock washers.

The jacketed core of each submarine cable entering terminal cabinets shall be secured at the entrance wall by a watertight, bronze cable entrance sealing bushing as detailed on the Plans. No box shall be drilled for more conduits or cables than enter it.

Cable Duct

Conduit duct that each submarine cable shall be installed in shall be constructed of high density polyethylene (HDPE) pipe conforming UL651A and suitable for underground burial and sunlight and weather resistant. Wall thickness shall be based on a Standard Dimension Ratio (SDR) of at least 13.5 and thicker if necessary to prevent crushing or pinching of duct from external pressure. Size of duct shall be determined by size of outer diameter of submarine cable that shall be placed in duct. Duct diameter shall be sized based on the following: Square of duct diameter shall be 2.5 times greater than the square of

submarine cable diameter. Next larger size duct to the nearest inch shall be used. If Contract plans show a larger minimum size, the minimum sized shall be governed by the largest referenced.

Submarine Cable Termination Cabinet

Submarine Cable Termination Cabinets shall be NEMA 4X, 12-gauge 316 stainless steel enclosures with hinged, 12-gauge, stainless steel doors supported by a continuous stainless-steel hinge with removable pin. . Seams shall be continuously welded and ground smooth. Each enclosure shall be provided with an oil-resistant foam in place gasket and provided with heavy duty 3-point latching mechanism operated by Type 316L stainless steel padlocking handles. Provide NEMA 4X stainless steel drain fittings. Cabinets shall have bonding provisions on the door. Stainless steel boxes and cabinets shall be manufactured by Hoffman, Hennessy, Wiegmann or Engineer approved equal.

For all terminal, wire termination, power distribution blocks, etc see Specification "Movable Bridge Electrical and Control System".

Submarine cable termination cabinets shall have (2) NEMA 4X rated 48 Port fiber optic patch panels mounted inside the cabinet. Fiber optic patch panel shall be an environmental distribution center which shall be able to hold up to 12 closet connector housing (CCH) connector panels. CCH panels shall be ST type and compatible with 62.5 µm multi modal fiber optic cable for the bridge related fiber and LC type and compatible with singlemode fiber for the county networking fiber optic cable.

Factory Testing

All cable at the factory shall be tested in accordance with the latest test methods of ICEA/NEMA Standards for the types of cable and insulating materials specified and shall meet or exceed the minimum requirements and criteria for acceptance as set forth therein.

Prior to assembly and fabrication of the submarine cables, the individual insulated conductors to be incorporated in the cables shall be tested to demonstrate the quality of the production run. The conductors and insulating compounds shall meet the minimum physical and electrical requirements set forth in ICEA S-95-658, NEMA WC70, UL Standard 44 and referenced standards.

After each multi conductor cable is completely assembled and armored, the following inspections, measurements, and tests shall be performed. The tests shall be performed on a section of cable sample taken from each reel, in accordance with test methods described in the applicable ICEA/NEMA Standards, for compliance with the Contract Specifications:

Inspection of markings on cable for proper size, grade, type, and voltage rating.

Inspection of cable for physical condition of all materials with respect to defects and damage.

Quantity and measured size of each conductor, including quantity and size of its conductor strands, and the associated color code.

D.C. resistance and material of each conductor.

Measured wall thickness of insulation for each conductor, including minimum and average wall thickness per ICEA Standards.

Measured wall thickness of overall non-metallic jacket.

Visual inspection of condition of filler materials and identification of type of materials used.

Measured thickness of tapes and binders and types of materials used.

Measured diameter and quantity of individual wires used in wire armor, type, and condition of protective finish.

Insulation resistance of the individual conductor insulation.

High-voltage test for the entire assembled cable. High-voltage tests shall be made at the same voltage used on the individual wires before assembly into the cable.

Insulation resistance. The insulation resistance shall not be less than 80 percent of the original values for the individual wires.

CONSTRUCTION

Protection for Shipment

Each submarine cable shall be placed on its own individual cable reel that shall be substantial in construction to support the cable.

Cable shall be covered and cable ends protected to ensure no water or debris can enter.

Cables shall be stored at the site under a waterproof canopy or tarpaulin until their installation is to commence.

Submarine Cable Termination Cabinet

The ends of all conduits projecting into terminal cabinets and junction boxes shall be provided with bronze insulated grounding bushings. The insulated portion shall be of molded phenolic compound, and each fitting shall have a screw type combination lug for bonding. Insulated bushings shall be the O.Z./Gedney Type RBLG, or approved equal. All bushings in any box or enclosure shall be bonded together with No. 8 AWG bare copper wire.

Warranty

The manufacturer's standard warranty shall in no event be for a period of less than five (5) years after project acceptance, and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables used during repair. Submittals received without written warranties as specified shall be rejected in their entirety.

MEASUREMENT AND PAYMENT

Payment for MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS shall be made at the LUMP SUM (LS) price bid for MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS, (Bid Item No. 599.14250008) which price shall include all costs for MOVABLE BRIDGE SUBMARINE CABLE & HDPE DUCTS as described herein; all materials, labor, tools, equipment and all else necessary therefore and incidental thereto.

END OF SECTION

599.142600WE MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCT INSTALLATION

DESCRIPTION

This specification covers the requirements for providing a complete installation of High Density Polyethylene (HDPE) conduits and submarine cables for carrying power, control, ground and other circuits in the HDPE ducts. The work shall include all labor, materials, tools, and equipment required for a complete installation of HDPE conduits under the channel up to but not including handholes and building.

The work shall also include all labor, materials, tools and equipment required for the removal of the existing submarine cable.

The work shall also include installation, testing (field and laboratory), and place in satisfactory condition, to the Engineer, submarine cables, as well as the on-site services of the cable manufacturer's representative and Construction Diver

The work shall also include the installation, testing, and terminating of the Submarine Cable Termination Cabinets.

Any submarine cable damage incurred during handling or installation of the submarine cable shall be the responsibility of the Contractor to correct. The Contractor shall replace the cable at no additional cost to the County. The Contractor shall warrantee the in-service performance of the submarine cables for one year following final project acceptance.

Diver

The Contractor shall employ all personnel required to install the submarine cables, including any Diver required for the installation of the submarine cables or other construction purposes.

The Contractor shall furnish the necessary Divers and diving equipment to assure that the trench is properly excavated and that the ducts are properly laid and spaced therein. The Diver shall perform the necessary inspections. In making these inspections, the Diver shall operate as directed by the Engineer and shall report directly to him.

The Diver shall be provided by the Contractor for the necessary number of days to perform the specified excavation, inspections of the trenches, and placement of the ducts therein. The cost of supplying the Divers and necessary diving equipment shall be included in the unit prices bid for the submarine cable installations.

REQUIREMENTS

Comply with all applicable Federal, State, and local laws and regulations relating to material handling and disposal.

The work shall conform to all applicable Federal, State, and local laws and regulations of OSHA.

Quality Assurance

Tools used in the work under the "MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCT INSTALLATION" Pay Item shall be regularly used for completing the work successfully and efficiently.

The Contractor shall provide adequate plan and all necessary tools and instruments required for the proper performance of the personnel engaged in the execution of the specified work.

Measurements and Verification

Dimensions indicated on the Plans are nominal and are intended for guidance only. All variations from the nominal dimensions on the Plans shall be noted on the shop drawings.

Substitutions

The terms "approved equal", "of equal quality" and "or equal" which appear on the Plans and in these Specifications are intended to allow the Contractor to substitute other manufacturers and model numbers of products of equal quality and rating for those specified.

Prior to the Contractor's ordering of any substitute product, the Engineer's approval of the equivalence of the substitute product shall be obtained in writing. The acceptance of the substitute products is at the sole discretion of the Engineer who shall establish the basis for equivalence and shall review the quality of the materials and products described in detail on the submitted shop drawings and product data.

The Engineer shall indicate "Approved", "Revise and Resubmit", or "Not Approved" on the substitute material submittal. Upon return of a shop drawing showing rejection, the Contractor shall resubmit the shop drawing showing the specified product. Rejection shall not in any way result in any extra cost. Approval by the Engineer of any substitute products submitted by the Contractor shall not relieve the Contractor of responsibility for the proper operation, performance, or functioning of that product.

If any departures from the Plans or these Specifications are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted as soon as practicable for approval. No such departures shall be made without approval by the Engineer. All necessary changes required by the substitution in related machinery, structural, architectural, and electrical parts, shall be made by the Contractor at no additional cost.

Submittals

Site-Specific Work Plan

The Contractor shall prepare and submit the following working drawings and catalog cuts:

Catalog cuts, certified dimensioned cross-sectional prints, and a complete material list for all submarine cables, supports, terminal blocks, splice kits, terminal cabinets, concrete boxes, clay, accessories, and other electrical equipment.

A complete layout drawing to scale showing all concrete matts, duct paths, buried cable paths and accessories. Obstructions, utilities, and other problems areas shall be identified on the drawings. These drawings shall be submitted and approved prior to placing a cable order with any manufacturer.

Complete, detailed installation methods and procedures. The procedures shall include methods, materials and equipment used to survey the area, install the duct, clear the duct, remove spoils, install the concrete matts, pull the submarine cables, and complete the installation. The pulling of the cables shall include a complete pulling plan which includes load to pull the cables and shall be compared to manufacturer recommended maximums. Buoyancy calculations showing the intended concrete mattresses/ballast weights required such that the HDPE duct does not float to the surface.

A complete schematic conduit and cable diagram or diagrams showing the interconnection of all devices and equipment, including ducts and junction boxes, and showing all submarine cables. The size of each duct and submarine cable shall be shown on the diagrams. Each duct and submarine cable percent fill shall be shown.

The terminal lugs catalog cuts. The crimping tool catalog cuts and calibration reports for all tools used onsite.

Certification of calibration shall be submitted for the test equipment. Results of all initial tests and final tests after any unacceptable results are corrected shall be submitted to the engineer for approval.

Factory test results, laboratory test results, and field test results of testing the conductors.

The drawings and design calculations shall be prepared by a licensed Professional Engineer registered in the State of New York.

Submit for approval the materials, designed as required, to provide the requirements of this Section. The materials shall include:

HDPE conduits

Submarine Cables

The Inspection Diver shall prepare and submit a report to the Engineer stating the following items at a minimum:

Stating that the cables have been installed in accordance with the Plans. Plans of the as-built cable locations and depths shall be prepared by the Contractor's Engineer as well as a description of the in-place cable condition. This information shall be submitted to the Engineer as detailed herein these specifications.

Layout and installation details of the submarine cable, including a complete description of the plant, equipment, method, and procedure to be used in excavating trenches, laying of new HDPE ducts, backfilling, and installation of concrete mattresses/ballasts weights shall be included in the report.

MATERIALS

CONSTRUCTION

The Contractor shall include in his bid price any exploratory geotechnical testing required to develop the site-specific survey.

The work shall be performed without interruption to marine and vehicular traffic.

The Contractor shall provide proper equipment for pulling the submarine cables at the piers. He shall exercise proper care so as not to over stress, score, or cut the conductors, insulation, outer jacket, armor, or otherwise damage the cable.

The Contractor shall determine the proper type of pulling, lifting, or lowering devices for the cables, subject to approval by the Engineer, and shall include considerations for the quantity and size of conductors in the submarine cable and distances involved.

The Contractor shall provide a warranty for the installation, and it shall in no event be for a period of less than five (5) years after project acceptance, and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables used during repair.

Submission of Proposed Method of Installation

599.142600WE MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCT INSTALLATION

The Contractor shall submit, in detail, his proposed method of installing HDPE ducts for the submarine cables and shall obtain approval of the Engineer before any work is started.

For the cables in the ducts, the load to pull the cables through the duct shall be determined and checked with the cable manufacturer to make sure that the cable strength is sufficient to prevent damage to the cable during the pulling process.

The Contractor shall submit a detailed pulling plan to the Engineer for approval. This plan shall include equipment to be used, location of equipment during the pulling process, and placement locations for the cable to be installed. The plan shall also include calculations showing the pulling loads required and certified letter from cable manufacturer stating the loads shall not damage cable.

Soundings

Soundings shall be taken to determine the existing elevations of the riverbed, the location in plan and elevation of the existing submarine cables in the trench, and the elevations of the riverbed after removal of existing cables an installation of the new cables and the new cables are backfilled in place. The soundings shall be performed by a New York state licensed Land Surveyor. This information shall be submitted to the Engineer for his review and shall be shown on the as-built record drawings. The soundings shall also be submitted to the U.S. Coast Guard/Corps of Engineers. The cost for the surveying shall be included under this item.

The as-built record drawings shall attest to the actual location and depth and elevation (referred to the North American Vertical Datum of 1988 (NAVD 88) to which the new submarine cables have been installed and said drawings shall be certified by licensed Land Surveyor. Depth shall be at 10-foot intervals.

Installation

The new ducts shall be installed across the channels where shown on the Plans through conventional trenching. Where the ducts cross the navigable channel, they shall be buried below the bottom of the channel to a minimum depth of five feet. The route of the duct or ducts may have to be altered to avoid unforeseen obstructions. The trench shall be excavated so that the sides of the trench shall stand at their natural slope, anticipated to be 2L:1V.

The excavation and laying of new ducts shall be performed without damaging the bridge structure, fenders, pile clusters, or any existing substructure and as directed by the Engineer. Side casting is an acceptable method of excavation. This side cast material shall be reused as backfill as required.

The Contractor shall be required to take GPS locations that include the elevation of the ducts, every 10 ft, so that the location of the ducts can be accurately provided for As-built purposes. All information shall be displayed on a both plan and elevation indicating the proper location of the ducts.

During the installation of the cables, the Contractor shall arrange to have at the site an employee of the cable manufacturer. This representative shall be experienced in submarine cable handling and installation procedures whether in a trench or through ducts, and he shall advise the Contractor and the Engineer in these matters. This representative shall certify that the cable was installed in a manner approved by the manufacturer.

Each cable shall first be installed in HDPE duct that has been provided in the "MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS" specification prior to laying cable in trench. Duct shall be flooded with clean water, if necessary, to prevent buoyancy of duct from occurring during installation. Furthermore, concrete mattresses shall be designed and installed as necessary to keep HDPE ducts on the trench bottom. After concrete mattresses are placed and backfill has been completed, any clean water used to flood the ducts shall be evacuated prior to sealing. Submarine cable ends shall be protected to ensure no water get close to the cable ends at any time during the installation.

Each end of the HDPE ducts where the submarine cables exit shall be sealed and kept free from rain/water infiltration. Ducts shall be sealed after submarine cable termination. The procedure would include first using a packing filler around the submarine cables within the duct such that the sealing agent does not drop into the duct and fill the duct vertically. Once the packing filler is in place around the submarine cables, the duct shall be sealed by applying the expanding sealant on top of the packing filler and around the submarine cables. The expanding sealant shall expand around the submarine cables and the excess shall be formed on the top of the duct so that a neat plug cap is formed surrounding the cables. The sealant shall be water and vapor resistance. The sealant shall be capable of withstanding at a minimum of 20PSI of hydrostatic pressure for 7days. Sealant shall be FST Foam Duct Sealant as manufactured by Polywater, or FiloSeal+HD duct seal as manufactured by FiloForm, or NoFirno as manufactured by CSD Sealing Systems

After installation of the cables, soundings shall be performed by the Contractor as specified under section "Soundings." The submarine cables shall be permitted to settle 48 hours prior to final termination of the cables. After such time and completion and acceptance of specified field and laboratory tests, the Contractor shall backfill the open trench such that the original channel profile is established. The contractor shall reuse the material excavated/side cast during removal of the existing submarine cable as well as the trenching for the new ducts as backfill for the new submarine cable trench.

The cables shall be allowed to settle for a period of a minimum of 48 hours after the last cable has been placed, before any rigid connections or attachments are made. The submarine cables shall be of sufficient length to allow for slack in settlement and to allow for making permanent connections.

The Contractor shall determine the proper type of lifting or lowering device for the cables, subject to approval by the Engineer, and shall include considerations for the quantity and size of conductors in the submarine cable and distances involved.

Arrangement and Connection of Cables

Slack shall be provided for the submarine cables and their conductors in the terminal cabinets.

After the submarine cables have been installed in place and are awaiting termination, the ends of the conductors shall be test-capped, and the ends of the submarine cables sealed to prevent entry of moisture. The ends of the cables shall not be under water at any time.

Conductors inside the terminal cabinets shall be neatly formed into cables and laced with approved cable ties, with the individual conductors leaving the cable at their respective terminal points. These conductors shall be looped to allow not less than 3 inches of free conductor when disconnected.

Both ends of every single length of conductor in the submarine cable shall be permanently and clearly tagged in accordance with the same numbers or designation appearing on the wiring diagram. If wiring diagram is not available, the contractor shall tag the conductor based on field verified tagging or the Contractor shall make a tagging schedule based on field conditions. For conductors of size No. 10 AWG and smaller, all wire ends shall be provided with compression-type ring-tongue wire connectors suitable for connection to screw-type terminals.

Submarine Cable Termination Cabinets

Install Submarine Cable Termination Cabinets as shown on plans.

Field Acceptance Testing of Submarine Cables

All meters shall be calibrated per NIST guidelines within 6 months prior to the testing.

The Contractor shall arrange for and provide all the necessary field tests and inspections, as directed by the Engineer, to demonstrate that the entire submarine cable is in proper working order and in accordance with the Plans and Specifications.

After the submarine cables have been delivered to the site, prior to installation, the Contractor shall inspect and test the cables while on their reels in the presence of the Engineer. The Contractor shall:

Inspect markings on cables for proper size, grade, type, and voltage rating.

Inspect cable for physical condition of all materials with respect to defects and damage.

Record quantity and measured size of each conductor, including quantity and size of its conductor strands, and the associated color code.

Test the insulation resistance of each wire.

Test each fiber in the cable for attenuation (or decibel loss) in dB/kM. Return loss of light reflected back through the fiber from the far end. This value shall be less than -20dB. Measure and record the propagation delay. Measure and record the time domain reflectometry (TDR). Record any faults along the cable.

The field tests shall be compared to the shop test results to determine the condition of the cables. If test results indicate conductor failure, this shall reveal significant deviation from the factory tests and the Contractor shall be required to replace the faulty cable.

After the submarine cables have been installed in the trench or pulled through the duct, clamped, secured, and terminal connectors attached, but prior to final connections, all conductors shall be tested for insulation resistance by the Contractor, in the presence of the Engineer, and the test results recorded and submitted for approval.

The Contractor shall ensure that the Engineer receives at least 72 hours written notice in advance when field tests are to be made.

The Contractor shall submit the results of the test to the Engineer for approval before proceeding further with the work.

After approval of the insulation resistance test of the installed but unconnected submarine cables, the Contractor shall test the continuity of the individual conductors within submarine cable. The test is performed by tying together all conductors on the source side and on the destination side, except but one conductor on the destination side by isolating it and measuring the resistance between the destination side and the isolated conductor with all conductors tied together on the source side. The same procedure is followed for all conductors one at a time. This shall verify the continuity of all conductors from source to destination within the submarine cable. The contractor shall submit detailed procedure to the engineer for approval. Upon completion of the continuity test the Contractor shall connect the submarine cables and test the energized installation as directed by the Engineer.

If a fault or defect is found to exist or a cable does not otherwise pass the tests, the Contractor shall identify and tag the faulty cable or conductor in question.

If a fault or defect is in a cable, the Contractor shall remove all cable and shall furnish and install new cable, subject to all tests and acceptance requirements, all without additional cost to WCDPW.

If it is determined that the fault or defect is due to a termination of the cables, the decision to correct or repair the cable or replace the section in question shall rest with the Engineer.

The tests, including test equipment, test methods, and test data shall be as specified hereinafter.

Laboratory Testing on Samples of Submarine Cables

The Contractor shall provide for sufficient additional length of cable on each reel so that two (2) 15-foot samples of cable may be removed from each reel for test and inspection purposes. The sample shall be taken after installation of the cable from the leading portion of the cable that has been subject to the puling stresses and strains incurred during the installation.

In the presence of the Engineer, the Contractor shall cut two (2) - 15-foot samples from each reel and cut into a 13.5-foot section and a 1.5-foot section. Each section of the sample cable shall be individually tagged and marked by the Contractor with the date the sample was taken, manufacturer's reel number, size and type of cable, and Contract number. The 1.5-foot sections and the one 15-foot section from each cable shall be given to the Engineer and shall become the property of WCDPW. The Contractor, in the presence of the Engineer, shall cap, deliver (within 48 hours of installation), and submit the remaining 13.5-foot section per cable to a testing laboratory designated by the Engineer.

Contractor shall verify with the testing laboratory that the length of sample being provided is sufficient to perform the tests required.

The testing laboratory need not be located locally within the project area.

The Contractor shall ensure that the Engineer receive notice at least 72 hours in advance when samples are to be taken.

The following inspections, measurements, and tests shall be performed, and the results recorded by the testing laboratory, on the section of cable sample taken from each reel, in accordance with the test methods described in the applicable ICEA/NEMA Standards, for compliance with the Contract Specifications:

Inspection of marking on cable for proper size, type, and voltage rating.

Inspection of cable for physical condition of all materials with respect to defects and damage.

Quantity and measured size of each conductor, including quantity and size of its conductor strands, and the associated color code.

D.C. resistance and material of each conductor.

Measured wall thickness of insulation for each conductor, including minimum and average wall thickness per ICEA.

Measured wall thickness of overall non-metallic jacket.

Visual inspection of condition of filler materials and identification of type of materials used.

Measured thickness of tapes and binders and types of materials used.

Measured diameter and quantity of individual wires used in wire armor, type, and condition of protective finish.

Insulation resistance.

The laboratory shall submit seven (7) copies of certified test data results on the cable samples to the Engineer for approval. The Contractor shall pay the cost for testing the cable samples, including the costs of cable material, transportation of materials to the laboratory, and the submission of certified test data to the Engineer.

If, as a result of the laboratory tests, it is found that the cable does not comply with the approved certified factory test results or with the applicable ICEA/NEMA Standard, the Contractor shall be ordered to remove all cable that came from reel containing the defective cable sample and to remove the reel of defective cable from the work site, and the Contractor shall replace the defective cable with new cable, all without additional cost to The County. The Contractor shall be held responsible for any delays in execution of the work caused by the defective cable.

Insulation Resistance Testing Procedures

The test methods for measuring insulation resistance of cables installed in the field shall be in accordance with the specified NEMA Publications.

The test equipment shall include a megohm meter capable of generating a constant 1,000-volt D.C. source, calibrated in a range legible from 0 to 1,000 megohms and up to infinity, with heavy-duty, rubber-insulated, alligator-clip leads, and a guard-circuit terminal available for use if required.

Polarity for connecting the megohm meter to the cable under test and the duration of time for electrifying the cable before taking the resistance reading shall be in accordance with NEMA Publication.

The insulation resistance of each conductor in the installed wire-armored, multi-conductor submarine cables shall be measured between the conductor and all the wires in the armor, all of which shall be bonded together and grounded.

The measured values of insulation resistance for each conductor in the submarine cables shall be recorded for comparison with the test values determined at the factory and shall be submitted as part of the approved copy of the certified test data. The failure of any conductor in an installed submarine cable to demonstrate satisfactory insulation resistance shall be cause for the rejection of the submarine cable. If this should occur, the Contractor shall promptly remove the rejected cable and replace it with a new cable, subject to all the aforementioned tests and acceptances, all without additional cost to the County.

The Contractor shall record the measured insulation resistance for each cable, the cable length installed, cable and reel identification, date of test, ambient temperature, and weather conditions. The test results and date shall be submitted to the Engineer for approval and a copy shall be included in the supplemental material for the maintenance manual. The Contractor shall also submit a certificate identifying the test equipment used and stating it is accurate within limits as rated by the manufacturer.

MEASUREMENT AND PAYMENT

Payment for MOVABLE BRIDGE SUBMARINE CABLE AND HDPE DUCTS INSTALLATION shall be made at the LUMP SUM (LS) price bid, (Bid Item No. 599.14260008) which price shall include all costs for MOVABLE BRIDGE SUBMARINE CABLE & HDPE DUCTS INSTALLATION as described herein; all materials, labor, tools, equipment and all else necessary therefore and incidental thereto.

The Contractor shall submit to the Engineer a detailed breakdown of his costs under this item within 30 days of award of the contract. This breakdown shall be evaluated by the Engineer and be utilized as the basis for monthly progress payments for work satisfactorily completed. A minimum of 10 percent of the bid shall be retained until final acceptance of the bridge electrical system and the Contractor has completed all items on his punchlists, and all aspects of bridge operation, operator and maintenance personnel testing, training, and control are complete; as well as until final approval of the operation and maintenance manuals is granted by the Engineer.

END OF SECTION

ITEM 599.20200010 - REMOVAL OF EXISTING WARNING GATES AND BIKEWAY GATES

DESCRIPTION

Under this item, the Contractor shall disconnect, remove all the warning gates and bikeway gates. The work shall include all labor, materials, equipment necessary to remove all warning gates and bikeway gates as indicated in the plans or as ordered by the engineer.

MATERIALS

None Specified.

CONSTRUCTION DETAILS

Removal

The removal of the warning and bikeway gates shall be done according to the stages of construction:

> Stage 1: The contractor shall disconnect and carefully remove the existing southeast warning gate and bikeway gate assemblies, including roadway arms and mounting hardware, etc., from their existing locations as shown on the Contract Drawings.
>
> Stage 3: After satisfactory completion of stage 1 construction, the Contractor shall disconnect, and carefully remove the existing northwest warning and bikeway gate assemblies, including roadway arms and mounting hardware, etc., from their existing locations as shown on the Contract Drawings.

METHOD OF MEASUREMENT

This work will be measured on a lump sum basis for all warning gate and bikeway gate removals.

BASIS OF PAYMENT

The price bid will include the cost of all labor, materials and equipment necessary to complete the work.

ITEM 604.07210110 - RESETTING EXISTING DRAINAGE FRAMES ON EXISTING DRAINAGE STRUCTURES

DESCRIPTION

This work shall consist of removing, storing, and resetting existing drainage frames, complete with grates, covers, and appurtenances, to grade on existing structures or on existing drainage structures modified under the item, "Rebuilding Top of Existing Drainage Structures."

MATERIALS

Materials shall meet the requirements of the following subsections of Section 700:

Concrete Repair Material	701-04
Concrete Grouting Material	701-05
Precast Concrete Pavers	704-13

Concrete shall be Class A meeting the requirements of Section 501.

CONSTRUCTION DETAILS

The existing frames, grates, covers and appurtenances shall be removed, stored if necessary, cleaned and reset to the line and grade indicated in the Plans or as directed by the Engineer.

The existing masonry adjustment collar, or a portion of it, shall be removed where necessary for resetting of the existing frame. The existing frames shall be set to grade using precast concrete pavers and concrete grouting material and/or Class A concrete. The frames shall be set in a concrete grouting bed on the existing structure. If an adjustment frame or ring was removed from the structure, the collar shall be set at such grade that no adjustment frame or ring is needed.

Any asphalt pavement and shoulder courses, subcourses, curbs, sidewalks, lawns and other top surfaces removed or damaged during the work of removing the existing frames and setting the new frames, shall be replaced in kind, unless otherwise directed by the Engineer. This shall include all sawcutting necessary for this removal.

Existing concrete/composite pavement shall be removed and restored as per the details given in the plans.

METHOD OF MEASUREMENT

This work shall be measured by the number of existing drainage frames, complete with grates or covers, reset to grade on existing drainage structures or on existing drainage structures modified under the item, "Rebuilding Top of Existing Drainage Structures."

BASIS OF PAYMENT

The unit price bid for resetting each drainage frame shall include the cost of all labor, materials and equipment necessary to complete the work including any necessary sawcutting, removal and replacement of pavement and shoulder courses, subcourses, curbs, sidewalks, lawns and other top surfaces, unless otherwise indicated in the plans or proposal. Removal and restoration of concrete/composite pavement will be paid for separately.

Any frames, grates and covers broken through carelessness on the part of the Contractor shall be replaced at the Contractor's expense.

ITEM 605.16010008 – NON-PERFORATED PVC 4" DIA. PIPE
ITEM 605.16020008 – NON-PERFORATED PVC 6" DIA. PIPE
ITEM 605.16030008 – NON-PERFORATED PVC 8" DIA. PIPE

All the provisions of Item 605.16 of the Standard Specifications shall apply, except the pipe shall be non-perforated.

ITEM 607.99870011 - REMOVE EXISTING CHAIN-LINK FENCING

DESCRIPTION
This work shall consist of removing and disposing the existing chain-link fencing (including gates, if present) from the locations indicated on the contract plans or where directed by the Engineer.

MATERIALS
None Specified.

CONSTRUCTION DETAILS
The Contractor shall remove and dispose away from the site the existing chain-link fencing (and gates, if present), including the fence posts and footings as directed by the Engineer. All excavated areas shall be properly filled to match the surrounding area to the satisfaction of the Engineer.

METHOD OF MEASUREMENT
This work will be measured as the number of feet of chain-link fencing removed. Measurement will be along the horizontal projection of the center of the fencing, center-to-center of terminal fence posts.

BASIS OF PAYMENT
The unit price bid per linear foot shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work, including excavation, fill and all necessary incidentals.

ITEM 608.0105NN09 –CURB RAMP

DESCRIPTION
The work shall consist of constructing curb ramps, turning spaces, and associated curbing in accordance with the applicable Standard Sheets and Specifications, and in accordance with the Contract Documents.

The fifth and sixth number to the right of the decimal place (NN), in the item number, is a serialized number to match the different types of curb ramp configurations depicted in the US Customary Standard Sheets 608-01.

The work shall include demolition, saw cutting, disposal, fill, compaction, construction of the new curb ramps, turning spaces and associated curbing. Also included are detectable warning units (supplied and installed where required), repairs to affected asphalt and concrete (as necessary), topsoil, establishing turf (on disturbed areas), and finish work. All material and labor required to perform these tasks is included. Any required adjustments to utilities shall be performed under the specifications for that work.

MATERIAL
Materials required for this work shall comply with, but are not limited to, the following Sections: 402-2, 502-2, 503-2, 608-2, 609-2, and 610-2.

CONSTRUCTION DETAILS
The work shall be in conformance with the US Customary Standard Sheets 608-01 and 608-03. The work performed shall comply with, but is not limited to, the following Sections of the Standard Specifications: 401-3, 402-3, 502-3, 503-3, 608-3, 609-3, and 610-3.

Any existing utility facilities not indicated to be removed that are damaged by the Contractor's operations performing this work, shall be repaired by the Contractor, to the satisfaction of the Engineer, at no additional cost.

Survey Requirements
The contractor shall be responsible for field verifying all elevations, slopes, and dimensions to ensure that the final layout of sidewalks and curb ramps meet ADA requirements prior to pouring concrete or placing asphalt or pavers. A Contract Control Plan is not necessary for work limited to sidewalks and curb ramps.

METHOD OF MEASUREMENT
Payment will be made at the unit price bid for each type of curb ramp (as shown in the US Customary Standard Sheets 608-01), satisfactorily installed, in accordance with the Contract Documents.

BASIS OF PAYMENT
The unit price bid shall include the cost of furnishing all labor, material, and equipment necessary to satisfactorily complete the work, to the satisfaction of the Engineer. Excavation and disposal under curb ramps and subbase course under curb ramps will be paid for separately. Sidewalk

beyond the upper grade break or turning space, as shown in the US Customary Standard Sheets 608-01, will be paid for separately. Any required Survey shall be paid for separately under the lump sum price bid for survey operations. Any incidental asphalt and concrete materials shall be included in work and not paid separately.

Payment will be made under:

Item Number	***Description***	***Pay unit***
608.01050009	Curb Ramp as shown in project details	Each
608.01050109	Curb Ramp Configuration Type 1	Each
608.01050209	Curb Ramp Configuration Type 2	Each
608.01050309	Curb Ramp Configuration Type 3	Each
608.01050409	Curb Ramp Configuration Type 4	Each
608.01050509	Curb Ramp Configuration Type 5	Each
608.01050609	Curb Ramp Configuration Type 6	Each
608.01050709	Curb Ramp Configuration Type 7	Each
608.01050809	Curb Ramp Configuration Type 8	Each
608.01050909	Curb Ramp Configuration Type 9	Each
608.01051009	Curb Ramp Configuration Type 10	Each
608.01051109	Curb Ramp Configuration Type 11	Each
608.01051209	Curb Ramp Configuration Type 12	Each
608.01051309	Curb Ramp Configuration Type 13	Each
608.01051409	Curb Ramp Configuration Type 14	Each

ITEM 609.06000008 - CURB REMOVAL

DESCRIPTION:

Under this item the contractor shall remove and dispose of various types of existing curb where indicated on the plans or where directed by the Engineer.

MATERIAL:

Not specified.

CONSTRUCTION DETAILS:

The existing curbs shall be removed and disposed of in a neat and workmanlike manner.

The existing curbs to be removed are adjacent to existing pavements that are to remain, the contractor shall exercise extreme care during their removal so as not to damage the existing adjacent facilities in any way. In the event that such damage does occur as a direct result of the contractor's curb removal operation, repairs shall be made by the contractor to these existing facilities at no cost to the State and in a manner satisfactory to the Engineer.

Existing longitudinal tie bars are to be removed and disposed of in areas where new construction abuts the existing pavements that are to remain.

METHOD OF MEASUREMENT:

This work will be measured as the number of feet of existing curbs removed and disposed of, measured along their center line and within the limits indicated on the plans or where directed by the Engineer.

BASIS OF PAYMENT:

The unit price bid per linear foot shall include the cost of all labor and equipment necessary to complete the work, including sawcutting and removal and disposal of existing longitudinal tie bars.

ITEM 609.40000015 - REINFORCED PRECAST CONCRETE PARKING BLOCKS

Description: Under this item, the Contractor shall furnish and place Reinforced Precast Concrete Parking Blocks of the type detailed below at the location indicated on the plans or where directed by the Engineer.

Materials: All the provisions of §714-04 Precast Concrete Curb shall apply including those under sampling and testing.

Construction Details: The blocks shall be set true to line and grade on the existing pavement.

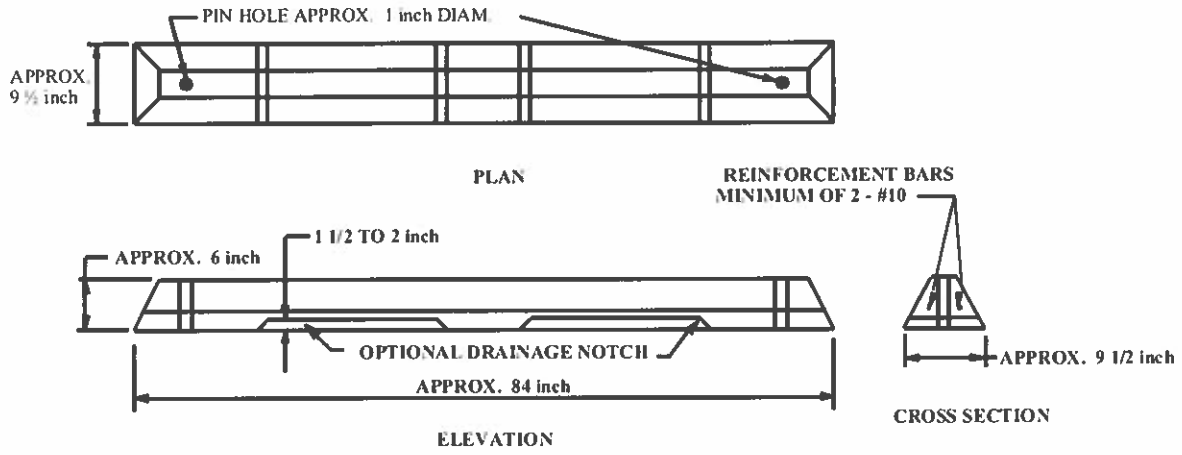
Attachment, to the existing pavement, shall be made with 7/8 inch round anchor pins, 24 inch in length. The pins shall be driven flush with the top of the block.

The blocks shall be placed where indicated on the plans.

The Contractor shall protect the blocks and keep them in first class condition until acceptance of the Contract. Any blocks that are damaged previous to the final acceptance of the work shall be removed and satisfactorily replaced at the Contractor's expense.

Method of Measurement: The quantity to be paid for under this item will be the number of blocks placed in accordance with the plans, specifications and orders of the Engineer.

Basis of Payment: The unit price bid for each block shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work, including the anchor pins.



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ITEM 619.07010001 - PLASTIC CONSTRUCTION DRUMS (EACH)

DESCRIPTION:
The Contractor shall furnish, install, move, relocate and maintain construction drums as shown in the Contract Documents or where directed by the Engineer, and in accordance with the Manual of Uniform Traffic Control Devices.

MATERIALS:
All the provisions of subsection 619-2.02J shall apply.

CONSTRUCTION DETAILS:
All the provisions of 619-3.02J shall apply. Applicable construction drums are those which maintain traffic for the duration of repairs. Drums shall either remain in place twenty four (24) hours per day or be installed and removed daily.

All drums in excess of the quantity required by other contract items will be provided under this item.

Construction drums shall be equipped with warning lights when required.

When warning lights are not required, and when allowed by the Engineer, cones may be substituted for drums.

METHOD OF MEASUREMENT:
Measurement will be made on an each basis for plastic drums. If cones are substituted for drums, the number of drums for payment will be computed as follows:

> (Total Number of Cones Used/25) = Number of Drums (Each) [Round up to the nearest whole unit]

BASIS OF PAYMENT:
The unit price bid for each shall include all labor, material, and equipment necessary to provide the required construction drums for the duration of the work at an individual site. The unit price shall include the cost of warning lights when required as well as all costs associated with the daily installation and removal of drums (when required) and the replacement of any damaged/deteriorated drums. No additional payment will be made for relocating construction drums within a given site, regardless of the size of the site or the duration of the work at the site.

ITEM 634.80210001 - REFURBISH ORNAMENTAL RAILING SYSTEM
ITEM 634.80220001 - NEW ORNAMENTAL RAILING SYSTEM

DESCRIPTION:

The work shall consist of dismantling, salvaging, transporting, refurbishing existing, providing new as needed and installing the ornamental railing system and painting, in accordance with the plans and where directed by the Engineer. By act of submitting a bid, the Contractor indicates that he has visited the project site and thoroughly examined all ornamental railing and posts so noted herein, and is aware of their deteriorated conditions and salvageable quantities.

MATERIALS:

General. For work exposed to view use materials selected for their smoothness and freedom from surface blemishes. Items indicated are existing historical parts, having a heritage value and are to be reused, salvaged, refurbished or rebuilt. The Contractor shall create new castings as required to match the existing railing post. Approvals of the Engineer are required.

Prime Paint Coating. Primer, intermediate coat and top coat shall conform to the requirements of Section 572, Structural Steel Paint System - Shop Applied.

Color of the top coat shall be gloss black and samples are to be submitted to the Engineer.

Drill & Grout. Drill and grout as required for secure anchorage of handrails and railings to concrete masonry and other adjoining work; non-corrosive to materials joined. Provide anchor bolts as per Subsection 723-60, and all galvanized washers, lock nuts, nuts, etc. necessary for a complete installation of reinstalled railing system.

Cast Iron Post. ASTM A743/A743M or approved equivalent to match existing post material.

Steel Plates. ASTM A36.

Steel Stock Bar. ASTM A36.

Non-Shrink Non-Metallic Grout. As setting bed for reinstalled posts shall conform to Subsection 701-05 of NYSDOT Standard Specifications.

Welding Electrodes and Filler Metal. Type and alloy to match metal to be welded, and as recommended by the AWS. All welding shall be done prior to painting.

Fasteners. Provide bolts, nuts, lag bolts, machine screws, as required for application as indicated on the drawings. Hot-dip galvanization of fasteners for exterior applications to comply with Subsection 719-01.

Fabrication. Manufacture railing posts to required shapes and sizes, with true lines, curves and angles. Clean and dress all exposed welds. Mill joints to tight hairline fit; cope or miter corners.

CONSTRUCTION DETAILS:

Refurbish Ornamental Railing System. Existing ornamental railing shall be disassembled on-site using methods to prevent damage to existing railing elements. The Contractor shall select those parts to be retained for modification and reinstallation. Retained elements shall be brought to workshop for blast cleaning to remove paint and extraneous oxidized materials. Refurbished elements shall be brought to the workshop for blast cleaning to remove paint and extraneous oxidized materials. Refurbished elements shall be reassembled in the field in accordance with the detail shown on the plans.

Related Documents. All work shall conform to Standard Specifications, Construction and Materials, latest edition and all Addenda thereto.

ITEM 634.80210001 - REFURBISH ORNAMENTAL RAILING SYSTEM
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Disassembly. Disassembly of existing metal items that shall be cleaned in accordance with Steel Structures Painting Council Surface Preparation No. 6 (SSPC-6), Commercial Blast Cleaning and Section 572, Structural Steel Paint System: Shop Applied. All preparation shall be performed in shop conditions.

Welding. All welding shall conform to standards specified in the New York State Steel Construction Manual, latest edition.

Submittals. In addition to product data, submit the following:

1. Shop Drawings. Show details of fabrication, assembly and installation including templates for anchor bolt placement of posts.

2. Samples. Samples of materials and finished products as requested by Engineer: one completed refurbished ornamental railing panel with two reconstructed posts shall be erected on site or at a location mutually agreeable to Contractor and Engineer. Such "mock-up" shall be the basis for finished quality standards for the project, inclusive of painted finishes.

General Requirements for Reconditioning Existing Reusable Metal Items.

Disassemble items by methods causing least damage to existing parts.
Ship to shop.
Cleaning, cutting, welding, restructuring of all items shall be in shop.
Prepare surfaces by blast cleaning with approved methods to remove all paint and any extraneous oxidized materials. Remove any rusted materials by grinding and cutting.
Replace missing, or patch deteriorated items to match original shapes.
Form exposed connections with hairline, flush joints; use concealed fasteners where possible.
Welding of all cast iron items require preheating, proper surface preparation, post-heating and proper filler selections.
All items shall be painted in shop, touched up in field after reassembly.
Install as per locations of drawings.

General. Use materials of size and thickness shown, or, if not shown, of required size, grade and thickness to produce the finished product acceptable by the Engineer.

Welding. Weld corners and seams continuously, grind exposed welds smooth and flush. Contractor shall make tests for all welding to existing cast iron materials and submit documentation to Engineer for approvals. See

ANSI A247-SS7(1978), Standard Method for Evaluating the Micro Structure of Graphite in Iron Castings. Fabrications, processes, workmanship, safety precautions, etc., shall be as recommended by the American Welding Society, Miami, Florida and shall follow latest editions of Welding of Cast Iron, inclusive or preheating, surface preparation, post weld heat treatments and filler/electrode selections.

If existing materials are not weldable, as determined by the Engineer, brazing shall be a valid substitute and shall follow Principals and Applications of Brazing and Braze Welding, Vol. 4, Chap. 5 and Vol. 2, Chap. 11 of latest edition of the Welding Handbook by the American Welding Society.

Installation. Perform cutting, drilling and fitting required for installation; set work accurately in location, alignment and elevation, measured from established lines and levels. Provide anchorage devices and fasteners where necessary for installation to other work.

For Mortar application, Contractor shall refer to Standard Specifications Subsection 701-05.

ITEM 634.80210001 - REFURBISH ORNAMENTAL RAILING SYSTEM
ITEM 634.80220001 - NEW ORNAMENTAL RAILING SYSTEM

Touch-Up Shop Paint after installation. Clean field welds, bolted connections and abraded areas and apply same type paint as used in shop. Use galvanizing repair paint on damaged galvanized surfaces.

Set Work accurately with regard to location, alignment and elevation, plumb and free from rack.

Comply with AWS specifications where welding is required or indicated.

Cast Iron Posts. Holes in existing mounting flanges of posts mounted on sloped portions of walkway shall be enlarged to allow for differences between fixed slopes (angles) of cast iron panels and various slopes of curved walkway. Welds/brazing shall be ground smooth. New steel base plates and cast iron posts shall be provided to match existing. Bolt all base plates as shown on contract plans.

New Ornamental Railing. New ornamental railing shall match existing ornamental railing and shall be provided at locations and quantities shown in the Contract Plans.

METHOD OF MEASUREMENT:

Refurbish Ornamental Railing System. This work shall be measured by the total length in linear feet of existing ornamental railing that is removed, refurbished and reinstalled as shown on the plans.

New Ornamental Railing System. This work shall be measured by the length in linear feet of new ornamental railing installed to complete the total length of proposed ornamental railing system as shown on the plans.

BASIS OF PAYMENT:

Refurbish Ornamental Railing System. The unit price bid per linear foot for refurbishing ornamental railing system shall include the cost of all labor, materials and equipment necessary to complete the work. The unit price bid shall include but not limited to the removal of existing ornamental railing system to Engineer's satisfaction, shipping the ornamental railing to and from the fabrication shop, refurbishment of existing and installation of refurbished ornamental railing system as shown on the plans. The cost of replacing and unsalvageable portions in the existing ornamental railing system, as deemed necessary by the Engineer shall be included in the unit price bid for item refurbish ornamental railing system.

New Ornamental Railing System. The unit price bid per linear foot for new ornamental railing system shall include the cost of all labor, materials and equipment necessary to complete the work. The unit price bid shall include but not be limited to fabrication, transportation and installation of new ornamental railing system as shown on the plans.

The cost of installation shall include drilling of holes in the coping stone and anchorage of posts by approved grout as shown in the plans.

ITEM 634.99010017 - BUILDING CONDITION SURVEY
ITEM 634.99020017 - VIBRATION MONITORING (NONBLASTING)

DESCRIPTION

A. Building Condition Survey. This work shall consist of performing a building condition survey(s) and preparing permanent records as indicated in the contract documents prior to the commencement of work, after completion of work, and at locations and times during construction as directed by the Engineer.

B. Vibration Monitoring (Nonblasting). This work shall consist of performing vibration monitoring of background and construction activities and preparing daily and summary report(s) of vibration readings.

MATERIALS

A. Building Condition Survey. Provide general photography and video equipment, analog or digital, capable of superimposing the date and time on all images.

B. Vibration Monitoring (Nonblasting). Provide a 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions. Annual factory calibration is required throughout the duration of the work.

CONSTRUCTION DETAILS

A. General. The Contractor shall engage the services of a firm capable of furnishing a New York State licensed Professional Engineer to conduct a condition survey of the existing building(s) indicated in the contract documents in the Special Note entitled Vibration Criteria and an experienced vibration monitoring Consultant to measure peak particle velocities prior to, and during, construction operations. Submit as proof to the Deputy Chief Engineer Technical Services (DCETS) the experience and qualifications of the firm's personnel conducting the work.

B. Building Condition Survey. Provide, as a minimum, the following information:

1. Photographic and videotape documentation of the interior and exterior condition of the building(s).

2. Extent and location of existing signs of building distress such as cracks, spalling, signs of settlement, flooding, leaking, etc.

The Engineer may accompany the Contractor on each building condition survey for verification of the data recorded. Provide two copies of all documentation of each building condition survey to the Engineer.

C. Vibration Monitoring (Nonblasting). The DCETS may waive the requirements of vibration monitoring based on the results of the building condition survey.

Perform continuous vibration monitoring during construction operations when adjacent construction activities make monitoring prudent. The Contractor shall perform contract work in

a manner that will limit construction vibration at the specified locations to within the limits set within the contract documents.

1. Submittal of Written Vibration Monitoring Plan. Prior to performing work adjacent to specified locations, a written Vibration Monitoring Plan prepared by the Contractor shall be submitted to the Engineer a minimum of 10 work days in advance for approval. The Engineer will send a copy of the Vibration Monitoring Plan to the Geotechnical Engineering Bureau, Engineering Geology Section, for review and written comment. The vibration monitoring plan may be returned to the Contractor for revision or clarification.

The vibration monitoring plan shall include the necessary information to outline the recording collection. The vibration monitoring plan shall include, but not be limited to, the following items:

a. Contract Designations

- The name of vibration monitoring specialist(s).
- The scheduled start date and length of construction operations which require vibration monitoring.
- The limits of vibration monitoring work, including sites on or off State-owned right-of-way.
- The location of all structures to be monitored in proximity to the construction operation.
- The location of any underground utilities in proximity to the construction operation.

b. Experience and Equipment

- Submit proof and details, as references, of two projects in the past five years where the vibration monitoring consultant performing the work has satisfactorily monitored construction operations by recording maximum peak particle velocities (PPVs). Include contact information for each reference.
- Submit information on the required 3-component seismograph, capable of measuring particle velocity data in three mutually perpendicular directions, including: the manufacturer's name, model number, and documentation of factory calibration performed within the last 12 months.

c. Methods and Procedures

- The location of adjacent structures to be monitored and maximum allowable PPVs as indicated in the contract documents. If not otherwise specified, a maximum allowable PPV in accordance with the United States Bureau of Mines (USBM) Vibration Criteria (Figure 1) shall be observed at all structures.
- The location of seismograph(s) placements, as directed by the Contractor's Professional Engineer. Recording seismographs may be installed on selected structures.
- Appropriate details for anchoring the geophone(s).

- The procedure for tracking PPV throughout construction operations (e.g., Pile Driving Operations: pile tip vs. vibrations may be correlated through time of day. A record of the time of day at each depth interval, included on the pile driving records, would be required to correlate to a time-based readout of PPV).

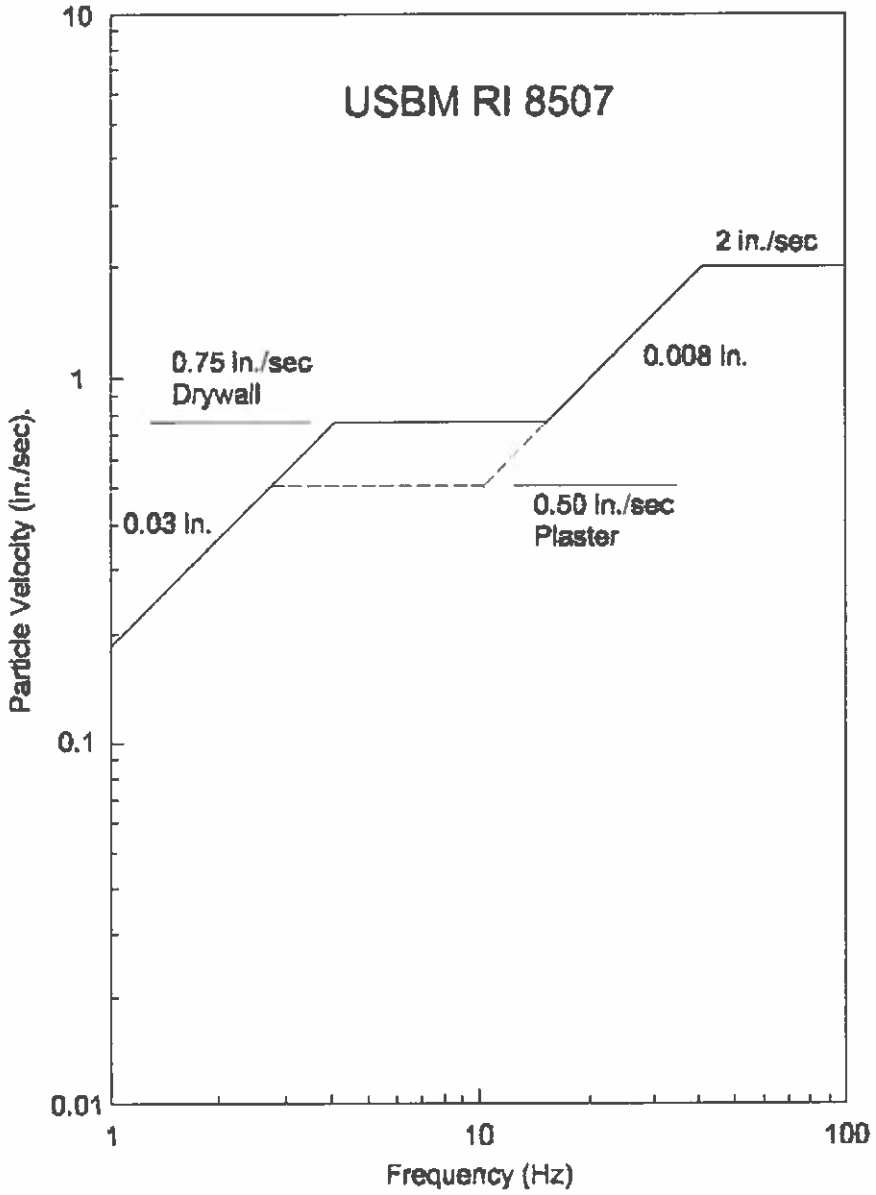


Figure 1—Safe Vibration Limit Recommendations for Residential Structures

Figure 1 – USBM Vibration Criteria (after Siskind et al, 1980)
The figure provides a "threshold damage" limit, defined as cosmetic damage (e.g., cracking) within the structure, categorized by both frequency ranges and particle velocity

2. Measuring Vibrations. The Contractor shall inform the Engineer immediately each time measured particle velocities exceed 85% of the allowable peak particle velocity. The Contractor shall make equipment or procedural modifications as required to avoid exceeding the allowable vibration intensity.

If the measured velocities exceed the maximum allowable PPVs, the Contractor shall stop operations immediately and revise equipment and procedures to reduce vibrations to allowable levels.

The Contractor shall be in communication with his monitoring firm's personnel during vibration monitoring at all locations to verify the data recorded.

The Contractor shall provide the Engineer with the results of daily vibration monitoring, one work day after the readings are taken. Upon completion of the construction operations for those locations requiring vibration monitoring, the daily submittals shall be synthesized into a final report.

If the seismographs show any indication of damage or vandalism, the seismographs shall be immediately recalibrated or replaced.

METHOD OF MEASUREMENT

A. Building Condition Survey. This work will be measured on a lump sum basis.

B. Vibration Monitoring (Nonblasting). This work will be measured on a lump sum basis.

BASIS OF PAYMENT

The unit price bid for building condition survey(s) and vibration monitoring shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work.

Vibration Monitoring (Nonblasting). Progress payments will be made for this item paid proportionally in accordance with the amount of work completed, measured on a workday basis.

Payment will be made under:

Item No.	Item	Pay Unit
634.99010017	Building Condition Survey	Lump Sum
634.99020017	Vibration Monitoring (Nonblasting)	Lump Sum

ITEM 639.2X010011 – CPM (CRITICAL PATH METHOD) PROGRESS SCHEDULE - Type 2

DESCRIPTION

This work shall consist of preparing, maintaining and submitting a Progress Schedule using the Critical Path Method on Oracle-Primavera P6 software which demonstrates complete fulfillment of all work shown in the contract documents. All work to prepare and maintain the CPM Progress Schedule shall be performed using the scheduling software application provided by the Department on network servers and accessed through the Internet with Department provided user accounts. The Contractor shall regularly revise and update the Progress Schedule, and use it in planning, coordinating and performing all work. Schedule activities shall accurately depict the entire scope of work to be performed to complete the project including, but not limited to, all work to be performed by the Contractor, subcontractors, fabricators, suppliers, consultants, the Department, and others, contributing to the project.

DEFINITIONS

Activity - A discrete, identifiable task or event that usually has an expected duration, has a definable Start Date and/or Finish Date, and can be used to plan, schedule, and monitor a project.

Activity, Controlling - The first incomplete activity on the critical path.

Activity, Critical - An activity on the critical path.

Actual Start date- At the activity level, the Actual Start date represents the point in time that meaningful work actually started on an activity.

Actual Finish date - At the activity level, the Actual Finish date represents the point in time that work actually ended on an activity (Note: in some applications areas, the activity is considered "finished" when work is "substantially complete.")

Backward Pass – Calculation of the late start and late finish dates for each activity, based on the start or finish dates of successor activities as well as the duration of the activity itself. It is also known as the second pass.

Baseline Progress Schedule @ Award- The Progress Schedule submitted by the Contractor and accepted by the Department that shows the plan to complete the construction contract work. The Baseline Progress Schedule @ Award represents the Contractor's plan at the time of Contract Award for completing the project.

Bid Date – The date the contract is let and there is an announcement by the Department of an apparent low bidder.

Completion Date, Contract - The date specified in Article 1 of the Contract for completion of the project or a revised date resulting from properly executed time extensions.

Anticipated Completion Date - The date forecasted by the Progress Schedule for the completion of the contract work.

Constraint - A schedule restriction imposed on the Start or Finish date(s) of an activity that modifies or overrides an activity's relationships.

Contemporaneous Period Analysis Method – A technique for evaluating schedule delays or time savings. The analysis period for the purpose of these provisions shall be the period covered in each regular progress update to the schedule, as they coincide with contract payments to the Contractor.

Contractor's First Day of Work - The day of the Contractor's first day of physical work within the highway Right-of-Way.

Contractor's Last Day of Work - The Contractor's last day of physical work in the field, and the Contractor has demobilized (no longer has any presence within the highway right-of-way).

Contractor Work Day - A calendar day scheduled for active prosecution of the work.

Critical Path – In the Progress Schedule the critical activities shall be those activities being on the longest path. In a project network diagram, it is the series of activities which determines the earliest completion of the project.

Critical Delay - An event, action, or other factor that delays the critical path of the Progress Schedule and extends the time needed for completion of the construction project.

Critical Path Method (CPM) – A network analysis technique used to predict project duration by analyzing which sequence of activities (which path) has the least amount of scheduling flexibility (the least amount of float). A scheduling technique utilizing activities, durations, and interrelationships/dependencies (logic), such that all activities are interrelated with logic ties from the beginning of the project to the completion of the project. Early dates are calculated by means of a forward pass using a specified start date. Late dates are calculated by means of a backward pass starting from a specified completion date (usually the forward pass's calculated project early finish date).

Data Date – The date entered in the Project Details, in the Dates tab, which is used as the starting point to calculate the schedule. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned."

Deliverable – Any measurable, tangible, verifiable outcome, result, or item that must be produced to complete a project or part of a project. Often used more narrowly in reference to an external deliverable, which is a deliverable that is subject to approval by the Department.

Draft Baseline Progress Schedule – An optional schedule submission that reflects an outline of the schedule format and content proposed by the Contractor's Project Scheduler to comply with the schedule provisions in the contract to solicit early comments by the Engineer, prior to the submittal of complete Baseline Progress Schedule @ Award.

Duration, Original - The original estimated number of working days (not including holidays or other non-working periods) in which the work task associated with the activity is expected to be performed. (The number of calendar days may be different based on the calendar assigned to the activity.) For certain activities such as concrete curing, or others approved by the Engineer, the calendar shall reflect no non-working days.

Duration, Remaining - The estimated time, expressed in working days (not including holidays or other non-working periods), needed to complete an activity that has started but has not finished.

Early Completion Schedule - A progress schedule will be considered an early completion schedule when the schedule submitted by the Contractor indicates a completion date that is earlier than the specified contract completion date, or the Finish date of any interim Milestone work activity is earlier than the date specified in the contract. This includes, but is not limited to, B-Clock activities, activities subject to Incentive/Disincentive provisions, and/or specific Liquidated Damages provisions, and Lane Rental activities.

Enterprise Project Management Database (EPMD) – The Department's database of construction project Progress Schedules.

Final Baseline Progress Schedule @ Award - The original plan against which the Contractor's progress is measured. The Final Baseline Progress Schedule @ Award represents the original plan at the award of the contract, of what is expected to happen. Once the Final Baseline Progress Schedule @ Award is accepted by the Engineer it is saved and used as a basis to compare against Progress Schedules Updates.

Float Suppression - Utilization of zero free float constraints which allows an activity to start as late as possible by using all of its' available free float. This technique allows activities to appear more critical than if the activity's total float was based on early dates. Assigning zero free float prevents true sharing of total float between Department and the Contractor. Utilization of overly generous activity durations and overly restrictive calendar non-working periods are also considered to cause float suppression.

Float, Free - The amount an activity can slip without delaying the immediate successor activities. Free Float is the property of an activity and not the network path.

Float, Total - The amount of time an activity (or chain of activities) can be delayed from its early start without delaying the contract completion date. Float is a mathematical calculation and can change as the project progresses and changes are made to the project plan. Total Float is calculated and reported for each activity in a network, however, Total Float is an attribute of a network path and not associated with any one specific activity along that path.

Fragnet – A subdivision of a project network diagram usually representing some portion of the project.

Global data – Data classified by Oracle-Primavera software as Global, including Project Codes, Global Activity Codes, Global Calendars, Resource Calendars, Global Filters, Resources, Global Reports, User Defined Fields and Unit of Measure.

Key Plans - Key Plans are graphic representations made by the Contractor's Project Scheduler on paper copies of the appropriate contract plan sheets that reflect the Contractor's planned breakdown of the project for scheduling purposes to efficiently communicate the Contractor's activity coding scheme to State scheduling staff. The key plans prepared by the Contractor shall clearly define the boundaries of the work for each designated Area, the operations contained in various Stages of work, and work in the Work Zone Traffic Control (WZTC) Phases. The alphanumeric codes on the key plans shall match the code values for the activity code "Area", "Stage", and "WZTC Phase" in the Progress Schedule.

Longest Path - The sequence of activities through the Progress Schedule network that establishes the Scheduled Completion Date

Look-Ahead Schedule – A three week time segment generated from the accepted Progress Schedule that shows the actual work progressed during the previous one week and forecasts the work planned for next two week period following the Data Date, and includes any major materials to be delivered and any lane closings or anticipated shifts in WZTC.

Milestone – An activity with zero duration that typically represents a significant event, usually the beginning and end of the project, milestones set forth in the contract proposal, construction stages, a major work package, or the contract interim time-related clauses.

Narrative Report - A descriptive report submitted with each Progress Schedule. The required contents of this report are set forth in this specification.

Open End - The condition that exists when an activity has either no predecessor or no successor, or when an activity's only predecessor relationship is a finish-to-finish relationship or only successor relationship is a start-to-start relationship.

Predecessor - An activity that is defined by Schedule logic to precede another activity. A predecessor may control the Start Date or Finish Date of its successor.

Progress Schedule – A general Oracle-Primavera P6 Schedule as defined by this Specification.

Progress Schedule Update – Changes to the Progress Schedule that reflect the status of activities that have commenced or have been completed, including the following items: (a) Actual Start date and or Actual Finish date as appropriate; (b) Remaining Duration for activities commenced and not complete; and (c) Suspend or Resume dates for activities commenced and not complete.

Progress Schedule Revision – Revisions to the Progress Schedule ensure it accurately reflects the current means and methods of how the project is anticipated to progress, including modifications made to any of the following items: (a) changes in logic connections between activities; (b) changes in constraints; (c) changes to activity descriptions; (d) activity additions or deletions; (e) changes in activity code assignments; (f) changes in activity Productivity Rates; and (g) changes in calendar assignments.

Project Scheduler – The person that is responsible for developing and maintaining the Progress Schedule.

Projects Planned Start Date – The date entered in the Project Details, in the Dates tab, that reflects the Contractor's planned start of work (based on contract requirements, and reasonable expectation for a Notice to Proceed) at the time the bid was submitted to the Department.

Projects Must Finish By Date – A date constraint entered in the Project Details, in the Dates tab, that reflects the Contract Completion Date set in the Contract Documents or through a formal contract extension of time.

Recovery Schedule – A schedule depicting the plan for recovery of significant time lost on the project. This separate CPM schedule submission shall provide the resolution and include appropriate changes in network logic, calendar adjustments, or resource assignments.

Relationships - The interdependence among activities. Relationships link an activity to its predecessors and successors. Relationships are defined as:

Finish to Start - The successor activity can start only when the current activity finishes.
Finish to Finish – The finish of the successor activity depends on the finish of the current activity.
Start to Start – The start of the successor activity depends on the start of the current activity.
Start to Finish – The successor activity cannot finish until the current activity starts.

Resources, Contract Pay Item – Contract Pay Item resources shall be identified as a Material resource type. When required, Contract Pay Item resources are developed for each Pay Item in the contract, with the Resource ID matching the contract Pay Item and the Resource Name matching the description of the contract Pay Item.

Resources, Equipment – Equipment resources shall be identified as a Nonlabor resource type. A unique identifier shall be used in the Resource Name or Resource Notes to distinguish this piece of equipment from a similar make and model of equipment used on the project.

Resources, Labor – Labor resources shall be identified as a Labor resource type. Labor Resources shall identify resources that encompass direct labor at the Crew level.

Scheduling/Leveling Report – The report generated by the software application when a user "Schedules" the project. It documents the settings used when scheduling the project, along with project statistics, errors/warnings, scheduling/leveling results, exceptions, etc.

State Business Days – Monday through Friday, with the exception of State Holidays. Days scheduled for the active prosecution of work activities by State staff or the State's representatives.

Substantial Completion - the day, determined by the Engineer, when all of the following have occurred:

1. The public (including vehicles and pedestrians) has full and unrestricted use and benefit of the facilities both from the operational and safety standpoint, and
2. All safety features are installed and fully functional, including, but not limited to, illumination, signing, striping, barrier, guard rail, impact attenuators, delineators, and all other safety appurtenances, and
3. Only minor incidental work, replacement of temporary substitute facilities or correction or repair remains for the Physical Completion of the Contract, and
4. The Contractor and Engineer mutually agree that all work remaining will be performed with short term lane closures to minimize delays, disruption, or impediment to the traveling public. No overnight lanes closures will be allowed.

Successor - An activity that is defined by Schedule logic to succeed another activity. The Start Date or Finish Date of a successor may be controlled by its predecessor.

Time Impact Analysis - A technique to demonstrate the comparison of a time impact of a Progress Schedule revision prior to a change in the Contract work, against the current accepted Progress Schedule. It is also known as a "What-If" analysis.

Weekly Status Report – The report generated weekly from the updated Progress Schedule in an electronic Adobe Acrobat PDF format that reflects a Data Date for that Progress Schedule Update period. The report

shall be formatted to fit ANSI Size D paper (610 mm x 914 mm) (24 inch x 36 inch), listing all work activities from the data date to contract completion, using the NYSDOT Status Report Layout, sorted by Early Start Date, Total Float in increasing order, showing the Activity ID, Activity Description, Original Duration, Remaining Duration, Total Float, Early Start date, Early Finish date, Start date, Finish date and Calendar ID.

Work Breakdown Structure (WBS) - A deliverable-oriented grouping of project elements, which organizes and defines the total scope of the project. Each descending level represents an increasingly detailed definition of project components or work packages.

Work Days – A calendar day (Monday through Friday) on which State offices are open to the public for business. State recognized public holidays are not work days. Days scheduled for the active prosecution of work activities by State staff or the State's representatives. (State Business Day calendar)

New York State Holidays	
New Years Day	January 1
Martin Luther King Day	3rd Monday in January
President's Day	3rd Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	1st Monday in September
Columbus Day	2nd Monday in October
Veteran's Day	November 11th
Thanksgiving Day	4th Thursday in November
Christmas Day	December 25th

If the holiday occurs on a Saturday, it will be observed the Friday before. If the holiday occurs on a Sunday, it will be observed the Monday after.

Work Package - A deliverable at the lowest level of the work breakdown structure. A work package contains activities.

MATERIALS

None Specified.

CONSTRUCTION DETAILS

A. General. In addition to the attributes of the Progress Schedule provisions as set forth in §108-01, the Contractor shall prepare, furnish, and maintain a computer-generated Progress Schedule using the Critical Path Method (CPM) utilizing Oracle-Primavera scheduling software on the Department's network servers. The CPM Progress Schedule shall be prepared based on the principles defined by the latest issue of the Construction Planning & Scheduling Manual published by the Associated General Contractors of America, except where superseded by the contract documents such as the CPM Special Notes and this specification.

The Contractor and the Department shall use the Progress Schedule to manage the work, including but not limited to the activities of subcontractors, fabricators, the Department, other involved State agencies and authorities, other entities such as utilities and municipalities, and all other relevant parties involved with the project.

No work other than installation of the Engineer's Field Office, mobilization, procurement and administrative activities, installation of construction signs, installation of erosion and pollution protection, clearing and grubbing, field measurements, and survey and stakeout will be permitted to start until the Baseline Progress Schedule @ Award has been submitted to the Engineer, and the Engineer determines there are no deficiencies consistent with those identified in paragraph I.1 *Immediate Rejection of Progress Schedule Submissions*. .

The purpose of the Progress Schedule, and scheduling provisions in the contract, shall be to:

a) Ensure that the Contractor and the Department have a detailed plan and resources to complete the project in accordance with contract time requirements;
b) Provide a means of monitoring the progress of work;
c) Aid in communication and coordination of activities among all affected parties;
d) Analyze the effect of changed conditions on any milestone dates or on the contract completion date;
e) Analyze the effect of change orders for extra work or deductions, and unanticipated delays, on the contract completion date;
f) Establish a standard methodology for time adjustment analysis based on the principles of the Critical Path Method of scheduling, to analyze delays and resolve construction disputes concerning time;
g) Determine appropriate extensions or reductions of Contract Time.

In scheduling and executing the work, the Contractor shall:

a) Sequence the work commensurate with the Contractor's abilities, resources and the contract documents. The scheduling of activities is the responsibility of the Contractor.
b) Ensure that Progress Schedules prepared by the Project Scheduler for submission to the Department are in compliance with the Contract. The intent should be that Schedule submissions and accompanying Narratives are timely, complete, accurate, and in compliance with the Contract.
c) Communicate all Contract changes, and decisions or actions taken by the Contractor and all subcontractors, fabricators, etc, that effect the Progress Schedule to the Project Scheduler in a timely manner to allow appropriate development, maintenance, and update of the Progress Schedule.
d) Include all work contained in the Contract and all work directed in writing by the Engineer. Work activities directed by the Engineer to be added to the Contract shall be included in the next Monthly Progress Schedule submission.
e) Assure that Progress Schedule Updates reflect the actual dates that work activities started and completed in the field.
f) Break a schedule activity into multiple activities to reflect a discontinuity in the work if a work activity is suspended in the field and restarted at a later date, and the break between when the work was suspended to when it was resumed is significant compared to the original activity duration.
g) Ensure the Progress Schedule contains all work constraints and Milestones defined in the Contract.
h) Schedule the work using such procedures and staging or phasing as required by the Contract. Work designated as part of separate stages may be performed concurrently with other stages where allowed by the Contract or where approved by the Department.

Failure by the Contractor to include any element of work required by the Contract in the accepted progress schedule does not relieve the Contractor from its responsibility to perform such work.

Should the Contractor choose to show activities in the schedule that reflects their plan of work prior to the contract award, the Department does not incur any liability and such work being performed between the letting date and the contract award date shall be considered at risk work.

Errors or omissions on schedules shall not relieve the Contractor from finishing all work within the time limit specified for completion of the contract.

B. Project Scheduler. The Contractor shall designate an individual, entitled the Project Scheduler, who will develop and maintain the construction progress schedule. The Project Scheduler shall be present at the Preconstruction Schedule Meeting, prepared to discuss, in detail, the proposed sequence of work and methods of operation, and how that information will be communicated through the Progress Schedule. The Project Scheduler shall attend all meetings, or receive meeting minutes that outline schedule related issues of those meetings, which may affect the CPM schedule, including but not limited to those between the Contractor and their Subcontractors and between the Contractor and the Department. The Project Scheduler shall be knowledgeable of the status of all aspects of the work throughout the length of the Contract, including but not limited to: original contract work, additional work, new work, and changed conditions of work.

C. Scheduling Software. The State will provide Oracle-Primavera P6 software and computer system for use by the Engineer to review the schedules submitted by the Contractor. The Department has installed

Oracle-Primavera P6 software on internet accessible servers for use by the Department's construction inspection staff. Appropriate Department personnel, Consultants, and Contractors will also have access to these schedules on the Department's Enterprise Project Management Database (EPMD). The Department will determine the location to store the project schedule files on the EPMD, and will provide the Contractor the naming convention for all progress schedule submissions. The Contractor shall develop, update, and revise the Progress Schedules using the Department provided Oracle-Primavera P6 software application and the Contractor shall store all Progress Schedule files on the Department's EPMD.

C.1 User Access. The Contractor shall submit completed and signed Request for Access Forms to the Engineer for each proposed Primavera user to obtain the User ID's and Passwords for access to software and data on the Department's network servers. The form can be downloaded from the following web page https://www.dot.ny.gov/main/business-center/contractors/construction-division/primavera. These forms may submitted any time after the contract letting date and announcement by the Department that the Contractor is the apparent low bidder. The Department will process these requests and should generally provide the User ID's and Passwords within two weeks of receipt by the Engineer. Upon approval by the Construction Supervisor and the Office of Construction, required User ID's and passwords will be provided to the Contractor (for the Project Scheduler plus one other person) to obtain secure Internet access to the Oracle-Primavera software and project schedule data. If the contract is not awarded to this firm, the firms access to this project will be removed. Department provided User Id's and Passwords are assigned to specific individuals and shall not be shared with any other users.

C.2 User Security Privileges. User security privileges within the Oracle-Primavera database will be created and maintained by the Department. The Department will be the sole entity to modify the Enterprise Project Structure (EPS), the Organizational Breakdown Structure (OBS), Project Codes, Global Activity Codes, Global Calendars, User Defined Fields, Security Profiles, Admin Categories and Preferences. The Contractor's users will generally have the security privileges to create and edit activities, project calendars, project resources, project activity codes, as well as schedule and summarize the project.

Project schedules are developed from the Contractor's knowledge of the project, and the means and methods represented in those schedules are based on the Contractor's understanding of the contract documents, and the Contractor's past experience, which are unique to the Contractor. Schedule activity data and logic are therefore the intellectual property of the Contractor and will not be made available to other Contractors. All other schedule data, and all Enterprise data residing on the network servers, are the sole property of the Department.

The Contractor will be the sole entity allowed to physically modify the following data within the progress schedule: activity IDs; activity descriptions; activity durations; relationships between activities; successors and predecessors, actual start and actual finish dates of activities; planned start and planned finish dates of activities; and activity resources (with the exception that activities assigned resources labeled to reflect Department personnel may be changed to reflect specific individuals, or job roles, within the Department).

The Department may modify certain data associated with the progress schedule to ensure conformance to the Department's Enterprise Project Management standard schedule format. This means that the Department may: create additional layouts, filters and reports; create and edit additional user defined custom data fields; assign Project Codes; add and assign additional project Activity Codes; add and assign additional Cost Account Codes; add and assign additional Resource Codes; enter data in Notebook tabs; modify calendar ID's (although not the calendar itself); etc; that do not alter the established activities or schedule logic of the Contractor. The Engineer shall communicate to the Project Scheduler the types and scope of changes planned to be made to the progress schedules prior to the implementation of those changes. The Contractor shall not delete or modify any schedule data entered by the Department without prior approval by the Engineer. The schedule data added by the Department shall be incorporated into future schedule submissions of the Contractor.

The Department may make copies of the Contractor's progress schedules to perform what-if type analysis, which may involve any type of modification to those copies of the schedules.

C.3 Software availability. Oracle-Primavera software and schedule data on the Department's EPMD will generally be available for the Contractor's use at all times unless system maintenance (e.g. backups, upgrades, etc) is being performed. System maintenance will generally be conducted over short time periods between the hours of 10 PM – 6AM, Monday - Friday and on weekends. The Department does perform regular backup of data contained in the EPMD, and will make every effort to restore the latest historical copy of schedule submissions in the event of any data failure of the EPMD. The Contractor shall also be responsible for exporting copies of project progress schedules, recovery schedules, TIA schedules, after data modifications have been made as their backup of these submissions. In the event a Contractor's authorized user cannot access the software from 6AM to 10PM Monday through Friday, the Contractor shall provide written notification to the Engineer.

C.4 Schedule Templates. The Department will provide the Contractor either a project specific Suggested Preliminary Construction Schedule or a project schedule template for the Contractor's use in developing their CPM Progress Schedule.

C.5 Importing/Exporting Schedules. Contractor's users will have the security privileges to "Export" their progress schedule files from the central P6 database to a computer. However, the Department will not allow any user to "Import" or accept Progress Schedule files from any other computer system back into the Department's EPMD.

D. Meetings.

D.1. Preconstruction Schedule Meeting. The Contractor shall contact the Regional Construction Engineer after notification they are the apparent low bidder, but no later than two (2) Work Days following notification of contract award to schedule a Preconstruction Schedule Meeting. The purpose of this meeting will be to discuss essential matters pertaining to the satisfactory scheduling of project activities, and to resolve any known questions regarding interpretation of the contract requirements for this work.

The Project Scheduler shall be prepared to discuss the following:

a) The proposed hierarchal Work Breakdown Structure (WBS) for the Progress Schedules. The Project Scheduler shall provide a paper copy at the meeting.
b) The proposed project calendars.
c) The proposed project activity codes and various code values for each activity code. The Project Scheduler shall provide a paper copy at the meeting.
d) The specifics of any contract Time-Related Clauses (A+B Bidding, Incentive/Disincentive, Liquidated Damages, Lane Rental, etc.);
e) The Contractor's schedule methodology to be employed, proposed work sequence and any proposed deviations from the contract plans with respect to Staging or Work Zone Traffic Control phasing.
f) The Key Plans shall be provided at the meeting.
g) The factors that the Contractor determines to control the completion of the project and any milestone activity completion dates contained therein.
h) The Project Scheduler shall provide an outline for the content of the Narrative report for future Progress Schedule submissions.
i) Schedule submission protocol for Progress Schedule submissions.

The Contractor shall submit to the Engineer for review, a minimum of five Work Days prior to the Preconstruction Schedule Meeting, the following: a copy of the Key Plans, a print out of the proposed Work Breakdown Structure, a print out of each of the proposed project Calendars showing the Work Days versus non-work days and hours per day, and a list of the Code Values for each Project Activity Code proposed to be used in the schedules.

The Engineer will be available to answer questions regarding scheduling, including: the availability of Department supplied electronic file(s) containing sample project schedule information, sample

progress schedule narratives, Special Notes for CPM Scheduling, and required standard format for CPM Progress Schedules for contract work.

The Contractor shall schedule meetings as necessary with the Engineer to discuss schedule development and resolve schedule issues, until the Final Baseline Progress Schedule @ Award is accepted by the Engineer.

D.2. Progress Meetings. One topic of the regular progress meetings held by the Engineer and attended by the Contractor shall be a review of the Weekly Status Report generated from the Progress Schedule. The Contractor shall be represented by the Field Superintendent and Project Scheduler. The Project Scheduler shall bring a copy of the printed plot of the current Weekly Status Report to the progress meeting, the report shall show the current anticipated schedule for all remaining work with the critical path activities highlighted.

a) The review of the Status Report serves as the forum to discuss project progress and delays, suggested remedies, necessary Progress Schedule revisions, coordination requirements, change orders, potential Contractor time extension requests, and other relevant issues. If contract work is falling behind the Progress Schedule, the responsible party (i.e.- Contractor or Department) shall be ready to discuss what measures it will take in the next thirty (30) days to put the work back on schedule so as to meet the contract Completion Date specified in the contract.

b) Items of discussion will include, but are not limited to: project progress; schedule progress; near term and long-term schedule issues, including RFIs, Shop Drawing submittals, permit work, utility relocations, mitigation work; project issues and risks; proposed solutions; and any relevant technical issues that are schedule related.

c) At the meeting the Project Scheduler shall compile an action item list that describes who is responsible for existing or pending issues and the date by which the issue needs to be resolved to avoid delays. The Contractor shall forward a copy of the action item list to the Engineer within 2 business days following the meeting.

E. Progress Schedule Submissions:

E.1. Draft Baseline Schedule. The Contractor is encouraged, but not required, to submit a Draft Baseline Progress Schedule that demonstrates a sample of how the Project Scheduler's proposed alphanumeric coding structure and the activity identification system for labeling work activities in the CPM progress schedule will conform to the detailed requirements of this specification.

This submittal may be made anytime following notice to the Contractor that they are the apparent low bidder on the contract.

Critical items for this review should include but are not limited to: the proposed WBS for subsequent progress schedules; the proposed project Calendars; project Planned Start date; project Must Finish By date; major milestone activities (e.g. - Award, Notice to Proceed, Contractor's First Day of Work, Contractor's Last day of Work, Anticipated Completion Date); and between fifty to one hundred summary activities for the major work deliverables of the contract (e.g. - pave EB from STA x to STA y, construct roundabout 1, construct bridge xyz, etc) that have assigned Activity Ids, Activity Descriptions, Activity Durations, Predecessors, Successors, and Activity Relationships. These summary activities will be broken down into, or supplemented with, individual work activities for the baseline submission.

If any Crew resources are included, the composition of the staffing (the number and titles of the various staff) shall be listed in the Notes tab of the Crew resource, and the composition of the crews shall be included in the narrative. To the extent practicable, the Draft Baseline Progress Schedule should include administrative and procurement activities to be accomplished during the contract; planned submittal, review, and approval dates for shop drawings, working drawings, fabrication drawings, and contractor supplied plans, procedures, and specifications.

Any submission of a Draft Baseline Progress Schedule should be accompanied by a written Narrative that provides details of the Calendar assignments of Working Days versus non-work days, outlines the sequence of planned operations to complete the project work, and provides the proposed Activity Codes and Code values to be assigned to activities in future submissions of project progress schedules.

The review and comment by the Engineer of the sample schedule should assist the Project Scheduler in assuring the first submittal of the Baseline Progress Schedule @ Award will be in general conformance with the requirements of the specification and other contract requirements, and that major rework of the Baseline Progress Schedule @ Award will not be required. The Engineer will review the logic diagram, coding structure, activity identification system, and Narrative; and provide comments for required changes by the Project Scheduler for implementation in the submission of the Baseline Progress Schedule @ Award. The Engineer will provide written comments on major deficiencies within five (5) Work Days of receipt. The Department reviews Draft Baseline Progress Schedules solely for format, and will not consider any submission of a Draft Baseline Progress Schedule for approval as an Early Completion Schedule.

E.2. Baseline Progress Schedule @ Award – Within ten Work Days of receipt of the contract award the Contractor shall prepare and submit a Baseline Progress Schedule that meets the following requirements:

a) The schedule shall accurately reflect the proposed approach to accomplish the work outlined in the Contract documents and conforms to all requirements of this specification.

b) The schedule shall define a complete logical plan that can realistically be accomplished, to execute the work defined in the Contract.

c) The schedule shall comply with the work constraints and milestones defined in the Contract as well as all other contractual terms and conditions. The schedule shall be consistent in all respects with the specific interim Time-Related Contract Provisions, and any order of work requirements of the contract documents. The schedule shall meet all interim milestone dates and the contractor's Anticipated Completion Date shall not extend beyond the contract completion date. This submission shall reflect the Contractor's plan at the time of contract award, and prior to the start of any work.

d) **Float.** No negative float is allowed in the Baseline Progress Schedule @ Award submission.

e) **Data Date.** The contract Award Date shall be entered as the Data Date. If the Contractor submits a Baseline Progress Schedule @ Bid submission, the Data date shall be the date of the schedule submission to the Engineer and not prior to the bid date. Time shall be the end of the work day.

f) **Activity Codes.** The Progress Schedule shall have assigned, to the maximum extent practicable, the Global Activity Codes (DOT GLOBAL) identified in the Department's Primavera enterprise solution. Including, but not limited to Responsible Party, Stage and Type of Work. The Contractor shall also use a Project Level activity code named "Subcontractor" with code values identifying each of the approved subcontractors working on relevant activities.

g) **Project Level Layouts & Filters.** Any "Layouts", "Filters" and "Report" formats that the Contractor develops for the various Progress Schedules submissions to the Engineer shall be saved and made available to all other users of the project schedule with a name that includes the contract D#.
The Contractor shall assign appropriate Activity Codes and provide custom Layouts, Filters, and/or report formats necessary to allow the Engineer to generate a report from the each Progress Schedule submission of all submittals required under the contract (i.e., shop drawings, required permits, erection/demolition plans, etc). The list shall show scheduled submission date, review date, and acceptance date for each submittal and identify the earliest activity affected by each of these submittals. This list shall be generated from each Progress Schedule submission until all such activities are completed.

h) **Schedule Submission**

i) Within the timeframe indicated in Table 1 column 1, the Contractor shall send an email to the Engineer and Area Construction Supervisor, with copy to CPMSchedulingSection@dot.ny.gov notifying them the schedule is ready for review.

TABLE 1 (in Work Days)		
Timeframe from receipt of Notice of Award to Submission of complete Baseline Schedule. (Column 1)	**Timeframe for Engineer's Review (Column 2)**	**Timeframe from Notice of Award to acceptance by the Engineer not to exceed (Column 3)**

10	10	40

ii) The Engineer will review the schedule and return it, accept it with comments, or reject it within the timeframes indicated in Table 1 column 2, following the date of receipt of the Contractor's submission.

iii) If the schedule is returned with comments, the Contractor shall address all comments and revise the schedule as necessary. The Contractor shall complete the Final Baseline Progress Schedule @ Award and obtain the acceptance of the Engineer within the timeframe required in Table 1 column 3.

iv) If the schedule is accepted without any comments by the Engineer, the Contractor shall copy the schedule and rename it for submission as the Final Baseline Progress Schedule @ Award.

v) In no way does the Baseline Progress Schedule modify the contract documents.

E.3. Final Baseline Progress Schedule @ Award

a) If the Baseline Progress Schedule @ Award is returned to the Contractor with comments, the Contractor shall make a copy of the schedule and rename it as the Final Baseline Progress Schedule @ Award with comments addressed and revisions made as necessary. The Contractor shall complete the Final Baseline Progress Schedule @ Award and obtain acceptance of the Engineer within the timeframe required in column 3 of Table1, or within one week of the Contractor's receipt of the final comments by the Engineer, whichever is sooner.

b) The Engineer shall review the schedule and return it, accepted or with comments, within 5 Work Days following the date of receipt of the Contractor's submission.

c) The Final Baseline Progress Schedule @ Award must be "accepted" or "accepted as noted" by the Engineer prior to the Department evaluating any Contractor disputes associated with time impacts. This does not preclude the Contractor from submitting a dispute while the schedule is being reviewed for acceptance.

E.4. Progress Schedule Updates and Weekly Status Reports:

a) The Contractor shall perform a Progress Schedule Update, on a minimum, at the end of each week.

b) The Contractor shall generate a Weekly Status Report at the end each work week after performing the Progress Schedule Update and Scheduling the project with a Data Date of day the schedule was updated, and submit it to the Engineer by the beginning of business each Monday. The Weekly Status Report shall be generated using the activity Layout named Weekly Status Report, with activities grouped by the WBS, sorted by Finish Date. The Gantt Chart shall clearly indicate the project critical (longest) path. Graphical representations shall be shown at a suitable scale to be legible and readable.

c) During any time periods within the contract that special time-related contract provisions are in effect, including B-Clock periods or Incentive/Disincentive Periods, the Engineer may require more frequent Progress Schedule Updates and/or Progress Schedule Status Reports.

E.5. Monthly, Bi-Weekly, or Weekly Progress Schedule Submissions.

a) **First Progress Schedule Submission** – Within three Work Days following acceptance of the Final Baseline Progress Schedule @ Award the Contractor shall perform a Progress Schedule Update to reflect the status of all activities where work was performed in the time period between the start of work and acceptance of the Final Baseline Progress Schedule @ Award. This shall include actual dates entered in the Actual Start and Actual Finish columns, and percentage of work complete for uncompleted activities, in addition the Contractor shall incorporate any Progress Schedule Revisions that reflect any changes in how future work activities are to be completed.

b) **Subsequent Progress Schedule Submissions** – The Contractor shall prepare and submit subsequent Progress Schedule submissions on a regular basis based on the schedule type determined in the pay item in the contract.

Type 2A. Monthly Progress Schedules
Type 2B. Bi-Weekly Progress Schedules
Type 2C. Weekly Progress Schedules

The Contractor shall submit a copy of the current Progress Schedule that includes all Progress Schedule Revisions and Progress Schedule Updates to reflect the actual and planned prosecution and progress of the contract work. Progress Schedule Updates shall reflect the status of activities that have commenced or have been completed, including the following items: (a) actual dates in activity Actual Start and Actual Finish columns as appropriate; (b) actual Remaining Duration for activities commenced and not complete; and (c) actual activity Suspend or Resume dates for activities commenced and not complete. Progress Schedule Revisions reflect modifications made to activities in the current project baseline schedule in any of the following items: (a) activity Original Duration; (b) changes in logic connections between activities; (c) changes in Constraints; (d) changes to Activity Descriptions; (e) activity additions or deletions; (f) changes in Activity Code assignments; (g) changes in Calendar assignments, and Work Days; (h) Productivity Rates; (i) a list of Notebook Topic additions and changes . All "Out of Sequence" activities noted in the scheduling log shall be corrected to reflect the current construction operations.

c) For any contract time extension requests the Contractor shall include: a Time Impact Analysis (TIA) for any changes to the schedule for future work for such issues as Added Work, VECP, or Changed Conditions; and a Delay Analysis that documents all delays from the Contract Award to the current date that is based on critical path delays that occurred when comparing subsequent Monthly/Bi-Weekly or Weekly Progress Schedule submissions and the supporting delay documentation in the Progress Schedule Narratives.

E.6. As-Built Progress Schedule. The Contractor shall submit the As-Built Progress Schedule with Actual Start and Actual Finish dates for all activities, within ten (10) Work Days following final acceptance of work by the Regional Director.

E.7. Look-Ahead Schedule. Except during winter shutdown periods the Contractor shall prepare a Look-ahead Schedule as either a plotted report from the current progress schedule, or as a narrative report, and provide it to the EIC on a weekly basis, or if approved by the Engineer on a mutually agreed upon interval The Look-ahead schedule shall include all work activities planned for the next two week period, and include all work activities progressed in the previous one week period, and should also show: anticipated lane closures, road closures and detours, environmental issues, and utility issues. The Engineer will provide the Project Scheduler with guidelines for determining the begin dates and end dates for the one or two week reporting periods, along with the how the plotted schedule report or narrative report shall be formatted.

The Department generally uses this Look-ahead schedule to facilitate communication with other Federal or State agencies, local municipalities, utility companies, railroads, emergency service providers, public news media and other affected parties.

F. Detailed Progress Schedule Requirements.

F.1. Baseline Progress Schedule. As a minimum, the Contractor shall address the following:

a) Defining Project details and defaults – Within the Dates tab, the "Planned Start" shall be the Letting Date, the "Data Date" shall be the date of Contract Award, the "Must Finish By" date shall be the contract Completion Date. Within the Settings tab, define the Critical Activities as the "Longest Path". The Project Scheduler role does not have security privileges to change this data in the project Details tab, however they have the ability through the "Schedule" function. Any requests for changes to other data with the Project Details needs to be forwarded by email to CPMSchedulingSection@dot.ny.gov; include in your request the contract Dnumber and the ProjectID.

b) Sufficient activities shall be included to assure that there is adequate planning for the entire project. The appropriate number of activities will be largely dependent upon the nature, size, and complexity of the project. In addition to all site construction activities, network activities shall include: activities necessary to depict the procurement/submittal process including shop drawings and sample submittals; the fabrication and delivery of key and long-lead procurement elements; testing of materials, plants, and equipment; settlement or surcharge periods activities; sampling and testing period activities; cure periods; activities related to temporary structures or systems; activities assigned to subcontractors, fabricators, or suppliers; erection and removal of falsework and shoring; major traffic stage switches; activities assigned to the Department and other involved State agencies and authorities, including final inspection; activities to perform punch list work; and activities assigned to other entities such as utilities, municipalities, County government/agencies, and other adjacent contractors. The schedule shall indicate intended submittal dates, and depict the review and approval periods as defined in the Contract Documents for Department review.

c) The following Activity ID's and Activity Descriptions exactly as shown in Table 2 shall be incorporated into all Progress Schedules:

TABLE 2

Activity ID	Activity Description	Duration (Min)	Predecessor	Logic Tie	Responsible Party
M00001	Contract Letting Date	0 - Start Milestone	----	----	NYSDOT
00020	Contract Award Process	45 Calendar Days	M00001	SS	NYSDOT
C00005	Preconstruction Schedule Meeting	1 Work Day	M00001	SS	NYSDOT
C00011	Prepare & Submit DMWBE Goals	Minimum 1 Contractor Work Day	M00001	SS	Contractor
C00015	DMWBE Utilization Approved	15 Work Days	C000011	FS	NYSDOT
C00030	Submit Proof of Insurance	1 Contractor Work Day	M00001	SS	Contractor
M00025	Contract Award Date	0 - Finish Milestone	00020, C00015	FF	NYSDOT
C00010	Preconstruction Meeting	1 Work Day	M00001	SS	NYSDOT
C00035	Notification to Proceed	5 Work Days	M00025, C00030	FS	NYSDOT
C00040	Prepare/Submit Safety & Health Plan	Minimum 1 Work Day	M00001	SS	Contractor
C00045	Approve Safety & Health Plan	20 Work Days	C00040	FS	NYSDOT
M00050	Contractor's First Day of Work	0 - Start Milestone	C00035, C00045	FS	Contractor
C00055	Set Up Engineer's Field Office	20 Contractor Work Days	C00035	FS	Contractor
C00060	Prepare & Submit Baseline Progress Schedule @ Award	10 Work Days from Notice of Award	C00005	FS	Contractor
C00065	Review Baseline Progress Schedule @ Award	10 Work Days	C00060, M00025	FS	NYSDOT
C00070	Accept Baseline Progress Schedule @ Award	1 State Business Days (see Note 1)	C00065	FS	NYSDOT
C00075	Mobilization	20 Contractor Work Days	M00050	SS	Contractor

TABLE 2					
Activity ID	**Activity Description**	**Duration (Min)**	**Predecessor**	**Logic Tie**	**Responsible Party**
M00100	Field Work Begins	0 - Start Milestone	M00050, C00055, C00060		Contractor
M00900	Substantial Completion	0 - Finish Milestone	See definition	FF	Contractor
C09010	Other Agency Inspection	20 Work Days	M00900	FS	Others
C09020	NYSDOT Final Inspection	20 Work Days	M00900	FS	NYSDOT
C09030	Punchlist Work	20 Contractor Work Days	C09020	FS	Contractor
M00950	Contractor's Last Day of Work	0 - Finish Milestone	C09030	FF	Contractor
M00999	Anticipated Completion Date	0 - Finish Milestone	M00950	FF	Contractor
C09040	Demobilization	10 Contractor Work Days	C09020	FS	Contractor
M00925	Regional Recommendation for Final Acceptance	0 - Finish Milestone	C09040	FF	NYSDOT
M09999	Final Acceptance by the DCEC	0 - Finish Milestone	M00925	FF	NYSDOT
M99999	Final Agreement	0 - Finish Milestone	M09999	FF	NYSDOT
M99998	Final Payment	0 - Finish Milestone	M99999	FF	NYSDOT

Note 1 – Acceptance Date shall not exceed 40 Work Days from Notice of Award.

The Logic Tie shown shall be used as a relationship to the predecessor activities contained in the column named Follows.

d) **Work Breakdown Structure (WBS)** - A multi level hierarchal WBS shall be incorporated that provides a deliverable-oriented grouping of activities and defines the total scope of the project. The Contractor shall develop a detailed project specific WBS for the Engineer's review and approval. The Engineer shall make the final determination on the number of levels of the WBS, and how the activities shall be grouped to represent the deliverables of the project.

For all projects the first two levels (nodes) of the WBS shall be labeled as follows:

Level 1 - is the project level; and shall have the project name.

Level 2 - shall have three nodes; "PRECONSTRUCTION", "CONSTRUCTION", and "POST CONSTRUCTION";

Level 3- under "PRE-CONSTRUCTION", shall include at least three nodes "GENERAL SUBMITTALS", "SHOP DRAWINGS"; and "PROCUREMENT/FABRICATION/DELIVERY".

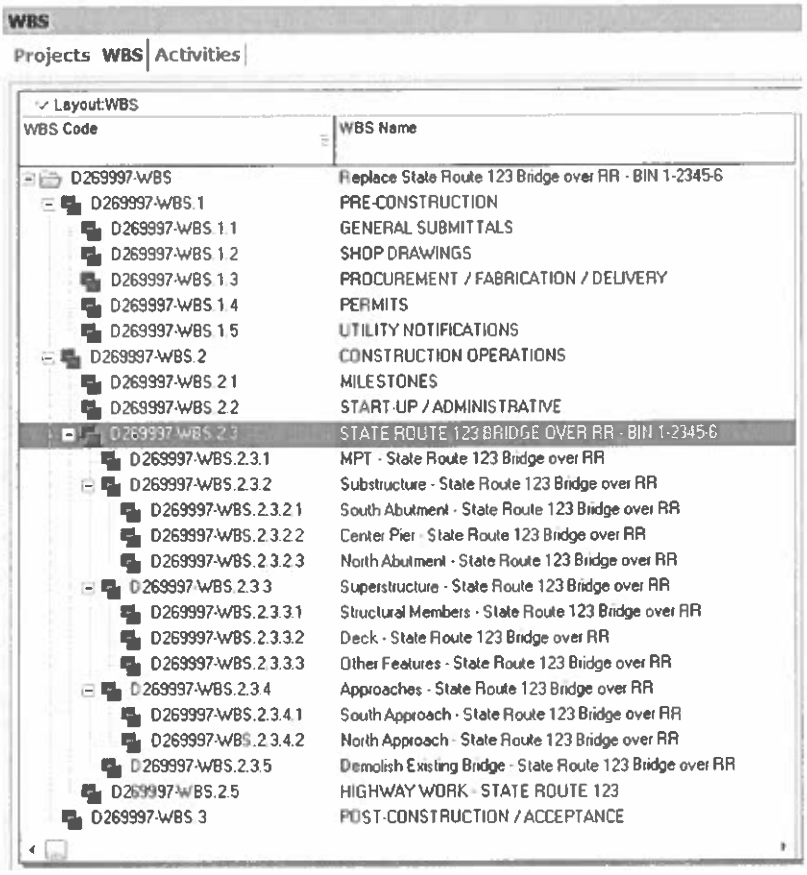
Level 3- under "CONSTRUCTION"; shall have three nodes "PRE-CONSTRUCTION", "CONSTRUCTION OPERATIONS", and "POST CONSTRUCTION/CLOSEOUT";

Under the "CONSTRUCTION OPERATIONS" node, the grouping of activities may vary depending on the scope and nature of the project work. The Contractor shall coordinate with the Engineer to determine the best way to represent (group activities) the project deliverables (i.e. Bridge, Roundabout, Highway segment, Interchange, Intersection, etc) and the various Stages or Phases of work. The Engineer may require sub nodes for AREA (geographic area within the project limits), STAGE, or for a bridge project SUBSTRUCTURE, SUPERSTRUCTURE, and DECK .

Generally Level 4 would be by geographic area within the project limits, Level 5 would be by highway feature (bridge, highway segment, intersection), Level 6 the highway features should be broken into their components (a bridge into components such as Piles, Substructure, Superstructure), and a highway segment into components such as pavement, drainage, earthwork, lighting, traffic signals, etc.

An example Work Breakdown Structure is shown below in Figure 1

FIGURE 1



e) **Activity ID** - Include a unique identification number for each activity. Activity ID numbers shall not be changed, or reassigned for the duration of the contract. Task type Activity IDs shall be prefixed by a "C". Milestone type activities shall be prefixed by an "M". .

f) **Activity Name** - Clearly and uniquely define each activity name with a description of the work that is readily identifiable to inspection staff and the progress of each activity can be measured. Each Activity shall have a narrative description consisting at a minimum of a verb or work function (i.e.

form, pour, excavate, etc), an object (i.e. slab, footing, wall, etc), and a location (i.e. STA, bridge or retaining wall number, street, etc). The work related to each Activity shall be limited to one Area of the contract, one Stage of the contract, one WZTC Phase of the contract, and one Responsible Party of the contract. The Activity Name shall not be changed for the duration of the contract without approval of the Engineer.

g) **Milestone Activities** - Include activities for all contract milestones that define significant contractual events such as Contract Award, Notice to Proceed, Contractor Start Work, Substantial Completion, Physical Completion, Contract Completion, and coordination points with outside entities such as utilities, State agencies, Authorities, municipalities, Time-Related Contract Provisions, etc.
   - The Contract Award milestone shall have a primary constraint of "Finish On" and the date of Contract signature by the State Comptroller,
   - The Contract Completion milestone shall have a primary constraint of "Finish on or before" and the contract Completion Date.
   - The Contractor Start Work" Start milestone activity, that will eventually reflect the actual date the Contractor started work authorized under the contract.

h) **Activity Durations** – Define the Original Duration of each activity in units of whole work days, except for activities of less than one day duration which should be shown in units of tenths of a day. Except submittal/procurement activities, durations shall not exceed 15 work days unless approved by the Engineer. Durations for Department submittal reviews shall meet the requirements set forth in the contract documents. If requested by the Engineer, the Contractor shall justify the reasonableness of planned activity time durations. Task Dependent activities shall not have a zero duration.

i) **Activity Relationships** - Clearly assign predecessors and successors relationships to each activity, and assign appropriate logic ties between activities (Finish to Start, Start to Start, Finish to Finish, etc). Do not have any open ended activities, with the exception of the first activity and last activity in the schedule. An activity may only appear once as a predecessor or successor to another specific activity, but may be assigned as a predecessor or successor to many different activities. Do not include inappropriate logic ties with Milestone activities (For a finish milestone activity: a predecessor shall only be assigned a Finish to Finish logic tie, a successor shall only be assigned a Finish to Start or Finish to Finish logic tie. For a start milestone: a predecessor shall only be assigned a Finish to Start or Start to Start logic tie, a successor shall only be assigned with a Start to Start logic tie). Lag time may not exceed 10 days. The Contractor shall not use negative Lag times.

j) The Contractor shall assign the "Contract Award Date" activity as a predecessor to all Review and Approval type activities to be performed by Department staff.

k) **Activity Constraint Dates** – The Contractor shall not have any constrained activities, with the exception of contractual dates, unless the Engineer accepts such constraints in writing. Milestone activities shall be included for the Contract Award which shall have a primary constraint of "Finish On" and the date of contract signature by the State Comptroller, and for the Anticipated Contract Completion which shall have a primary constraint of "Finish on or before" and the contract completion date indicated in the contract documents. Only contractual/owner-designated constraints are allowed unless specifically authorized by this specification or the Engineer. . If used, only Constraints of type, "Finish on or Before", 'Start on or After", or when deemed appropriate by the Engineer "As-Late-As-Possible" are acceptable

l) **Activity Dates** – With the exception of contract Milestone dates, "Actual Start" and "Actual Finish" dates and "Planned Start" and "Planned Finish" dates, activity dates shall be calculated by the project scheduler tool within the Oracle-Primavera software. No Actual Start or Actual Finish dates shall be entered in the Baseline Progress Schedule @ Award, with the exception of activities that were completed prior to the Contract Award.

m) **Calendars** - Use clearly defined calendars that account for expected seasonal weather conditions (including winter shutdown periods) and environmental permit requirements, for the planning and scheduling of activities. Do not incorporate an activity with a description of "Winter Shutdown" that requires constraints. Provide the working days per week, non-working holidays. Also provide the

number of shifts per day, and the number of hours per shift by using the Calendar feature, called "Time Periods" in the P6 software. Incorporate any seasonal restrictions to the work within calendars assigned to activities.

- Global calendars used in the progress schedule shall be those established by the Department. There are only two Global Calendars developed and maintained by the Department for use by Contractor's, they are the following:
  - NYSDOT Milestone/Curing 365 Day / 8 hour
  - State Business Days, 5 Day Work Week w/State Holidays, Field

  All milestone activities in the schedule shall be assigned the standard Global calendar named 'NYSDOT Milestone/Curing 365 Day / 8 hour", this calendar should also be assigned to any activities for concrete curing. Activities for shop drawing reviews and other approvals by Department personnel shall be assigned the Department's standard Global – "State Business Day, 5 Day Work Week w/State Holidays, Field" Calendar that reflects all holidays observed by the State.

  Changes desired for these calendars shall be forwarded by email to CPMSchedulingSection@dot.ny.gov, and if appropriate these changes will be performed by the Office of Construction system admin staff. This will be accomplished by making a copy of the existing Global calendar, and then the new calendar will be renamed and modified as necessary.
- Calendars related to specific resources (i.e., Crane, Bidwell, Asphalt Paver) shall be established as Project level Calendars (not Resource calendars), with the Calendar name clearly identifying the resource.
- All other calendars developed by a Contractor shall be established as Project Calendars, with the calendar name including the contract D# and describing the function (i.e., D260000 - Asphalt Calendar, D260000 - Concrete Calendar, D260000 - Landscape Calendar, D260000 - Painting Calendar, D260000 – Contractor's 5 Day/8 Hour Workweek). All work activities of the Contractor shall be assigned to Project Calendars.
- The Baseline Progress Schedule can not include a calendar that reflects any workers working more than 8 hours in any one calendar day or more than 5 days in any one week. (§102-10 LABOR AND EMPLOYMENT) Following the contract award the Contractor can add additional calendars in their next Monthly Progress Schedule submission based on an approved overtime dispensation.

n) Clearly define significant interaction points between the Contractor, the Department, and other entities including but not limited to: Federal, State and local agencies/authorities; and utilities. All activities of the Department, utility companies, adjacent contracts, and other entities that affect progress and influence any contract required dates including durations shall be shown in the schedule. This includes dates related to all Permits or Agreements. The schedule shall give special consideration to sensitive areas such as road closures and parklands and shall indicate any time frames when work is restricted in these sensitive areas as outlined in the permits issued by the regulatory agencies, and provided in the contract documents.

o) **Activity Resources** – It shall be the Contractor's responsibility to assure the activity logic in the schedule properly reflects their resource limitations. An activity shall not involve multiple crews comprised of the Contractor and a subcontractor, or multiple subcontractors.

The level of resource loading of the schedule shall dependant on the schedule Type.

Type 2A. Monthly Progress Schedules - The Contractor will generally not be required to develop Labor resources, Equipment resources or Contract Pay Item resources in the Resource Dictionary, or assign them to schedule activities.

Type 2B. Bi-Weekly Progress Schedules - The Contractor shall develop crew level Labor resources, along with Equipment resources in the Resource Dictionary, and assign them to schedule activities. Equipment resources for major or specialty equipment such as tower cranes, piledrivers, barges, asphalt pavers, concrete pavers, dozers, front end loaders, backhoes, rollers,

excavators, graders, long line striping truck or other equipment that cannot be rented easily shall be assigned to schedule activities.

Type 2C. Weekly Progress Schedules - The Contractor shall develop Labor resources, Equipment resources and contract Pay Item resources in the Resource Dictionary. The Contractor shall define labor resources for the project that comprise the various labor classifications (i.e. – Tower Crane Operator, Operator, Labor Foreman, Laborer, Carpenter, Teamster, Dock Builder, Iron Worker, Painter…), and these resources shall be assigned to schedule activities. Equipment resources for major or specialty equipment such as tower cranes, piledrivers, barges, asphalt pavers, concrete pavers, dozers, front end loaders, backhoes, rollers, excavators, graders, long line striping truck or other equipment that cannot be rented easily shall be assigned to schedule activities. The Department shall provide a resource library of Global Pay Item resources for all standard pay items contained in the Standard Specifications, and the Contractor shall develop pay item resources for any pay items for Special Specifications in the contract. For each activity in the Progress Schedule the Contractor shall assign the appropriate pay item resources, and within the resource details enter the appropriate quantity for each pay item. The Baseline Progress Schedule at Award shall include resource loading for the first ninety (90) days of anticipated contract field (non administrative) work. The remaining activities will require pay item resource assignments as required under paragraph F.2.c. The resource allocations shall be shown to a level of detail that facilitates report generation based on labor classifications and equipment classes for the Contractor and subcontractors. The Contractor shall optimize and level labor to reflect a reasonable plan for accomplishing the work of the contract and to assure that resources are not duplicated in concurrent activities. The time-scaled resource histograms shall show labor classifications and equipment classes to be utilized on the contract.

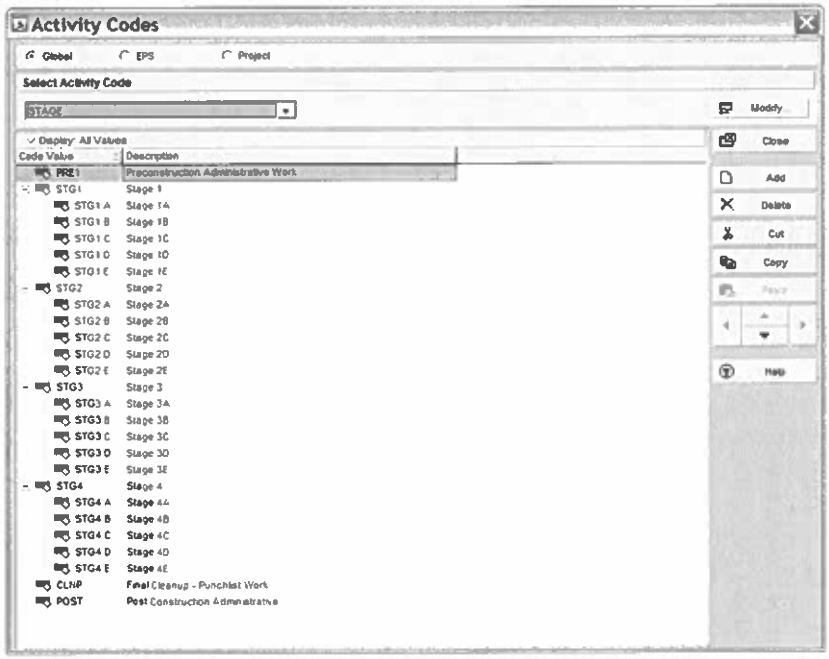
p) **Production Rates** – The Contractor shall enter the quantity of the major item of work for each non administrative activity in the schedule into the field labeled "PR Quantity", the Unit of Measure for that major item in the field labeled "PR Unit", the anticipated production rate of the equipment and labor resources for that activity of work in the field labeled "Production Rate / Day", and the associated duration for that work in the field labeled "PR Duration". These are all Activity level UDF fields, and can be found in the activity Layout named Contractor Production Rates.

q) **Activity Codes** – The Contractor shall include a well-defined activity coding structure that allows project activities to be sorted and filtered. Activity Codes shall include, but not be limited to: Responsible Party; Stage; Area of Work; Type of Work; Subcontractor; and additionally as required by the Engineer to meet the needs of the specific contract work to facilitate the use and analysis of the schedule.

- No Global Activity Codes shall be incorporated in any progress schedule submission to the Engineer except those established by the Department.
- The Global activity codes established by the Department shall be used to the maximum extent practicable. The Contractor shall assign the appropriate activity code values to each activity in the progress schedule for the following Global Activity Codes that are in the Department's enterprise database:
  1) RESPONSIBLE PARTY (DOT GLOBAL)
  2) STAGE (DOT GLOBAL)
  3) AREA (DOT GLOBAL)
  4) TYPE OF WORK (DOT GLOBAL)
  5) CHANGED (ADDED/DELETED) WORK (DOT GLOBAL)
  6) TIME Related Clauses (DOT GLOBAL)
  7) DELAY (DOT GLOBAL)
- Additional Activity Codes developed for specific projects shall be established as Project Activity Codes. As a minimum this shall include the following:
  1) SUBCONTRACTOR

r) **Activity Code Values** – Each Activity Code shall be broken down into various Activity Code Values that are then assigned to activities. For example, the Activity Code "Stage" shall include a hierarchal arrangement of Activity Code Values as shown below in Figure 2:

FIGURE 2



s) **Activity Code Assignments** - For each activity, within the activity details the Contractor shall assign Activity Code values to identify the "Responsible Party" (i.e. – Contractor, NYSDOT, Utility Co, Municipality) for the work to be performed (one and only one responsible party shall be assigned to each activity), the "Stage" of the contract for the work that will be performed, the "Area" where the work is to be performed, the "WZTC Phase", and the Type of Work (i.e. - Procurement, Paving, Embankment, Excavation, Electrical, Signing, etc). For activities included in work governed by time-related contract provisions, the appropriate "Time Related" activity code shall be utilized. For activities included in work added and/or changed within an Order-On-Contract, the appropriate

"Added/Changed Work" code shall be utilized. For all work activities performed by the Contractor or subcontractors/fabricators/suppliers, "Contactor" shall be designated as the Responsible Party

t) **Interim Milestone Dates with Liquidated Damages and Special Time-Related Contract Provisions** (i.e. – A+B Bidding, Incentive/Disincentive provisions, Lane Rental) – Each time-related contract provision in the contract shall be represented in the progress schedule by having a start and finish milestone, with appropriate predecessors and successors assigned to all schedule activities considered part of that time-related contract provision work including the start and finish milestone activities. In addition, the Start milestone for the time-related contract work shall have predecessors and/or date constraints assigned that include those defined in the contract documents, and the Finish milestone for the time-related contract work shall have successors and/or date constraints assigned that include those defined in the contract documents. All schedule activities associated with each specific time-related contract provision shall be assigned to a separate node within the project WBS and the WBS node description shall be labeled accordingly, in addition these activities shall be assigned the appropriate Time-Related Clauses (DOT GLOBAL) activity code value. A Level Of Effort activity shall be used for each time related contract provision (i.e - "Incentive 1 Duration" or "B Clock 1 Duration"), this activity shall have the Start Milestone as a predecessor with a SS relationship and the Finish Milestone as a successor with a FF relationship and the duration of this activity shall be calculated when the project is scheduled.

u) **List of Submittals** – The Contractor shall submit with the Progress Schedule a list of all Submittals (i.e. - Shop Drawings, required permits, Erection/Demolition plans, Heath and Safety Plan, etc.) generated from the Baseline Progress Schedule for review and approval by the Engineer. The Contractor shall use a Filter to limit the schedule activities shown in the report to only the prepare/submit, and review/approve activities related to submittals. For construction contracts that utilize Oracle-Primavera Contract Manager, Shop Drawing submittal activities in the Progress Schedule shall be at the Submittal Package level. The report shall be in Adobe PDF format and transmitted to the Engineer by email.

F.2. Weekly/Bi-Weekly/Monthly Progress Schedules. In addition to the detailed schedule requirements for the submission of the Baseline Progress Schedule @ Award, the Contractor shall complete the following additional requirements for these regular Progress Schedule submissions:

a) Activity Status -
   i) Durations – the Original Duration shall not be changed without prior written justification by the Contractor, and written approval by the EIC. The Contractor shall edit the Remaining Duration to reflect progress made on work activities, and shall not use Duration % . If a proposed change to Original Duration is due to additional or changed work to the contract the Contractor shall instead add an activity to reflect this additional work, and assign the appropriate Activity Code. The Contractor shall not use zero durations for Task Dependant activities.
   ii) Started and Finished dates – for each activity where work was begun during the Weekly/Bi-weekly or Monthly reporting period, the Contractor shall check the box adjacent to Started and enter the date the work began. For each activity where work was completed during the Weekly/Bi-weekly or Monthly reporting period, the Contractor shall check the box adjacent to Finished and enter the date the work was completed.
   iii) Suspended work – The first time that work has been suspended on a schedule activity, the Contractor shall enter the Suspend and Resume fields within the Project Details under the Status tab. For any subsequent suspensions of work to that activity the Contractor shall break that activity into two or more activities to accurately reflect the suspension and resumption of work dates in the field, and to more accurately reflect the relationship to other work activities.

b) Calendars – To change a project calendar for activities scheduled in the future, the Contractor shall copy the calendar and use a revised name that includes a reference to which Update the change was incorporated (i.e. - D260000 - Concrete Calendar should be revised to D260000 – 2 - Concrete

Calendar to reflect the 2nd Monthly Update when the change was made to the calendar). The reason for the change in the calendar shall be documented in the Narrative.

c) Resources –

Type 2C. Weekly Progress Schedules – For each of the first four Weekly Progress Schedule submissions the Contractor shall assign as a minimum an additional month of Labor, Equipment and Pay Item resources for anticipated contract field work. For each subsequent month of the contract the Contractor's Progress Schedule submission shall include labor, equipment and pay item resources for an additional year of anticipated contract work until all activities in the schedule have resources defined. Until such time that all activities are resource loaded, for any activity that resource limitations are affecting the prosecution of work, as determined by the Engineer, labor and equipment resources shall be entered in the schedule by the Contractor. When the resource assignments are complete for all schedule activities, the Engineer will compare pay item quantities in the schedule with pay item quantities in the Engineer's estimate to determine if all contract work is represented in the Contractor's schedule.

d) Notebook Tab –

i) Delays - For any activities on the critical path that are delayed during this monthly reporting period, the Contractor shall enter the dates the activity was delayed and the reason for such delay in the Notebook tab of that activity.

ii) Activity Changes – For any changes to activity logic, calendar assignments, suspended work, added or revised lag periods or constraints the Contractor shall document the change and reason in a Notebook Topic for that activity by assigning the appropriate "Progress Submission # Revision" and describing the changes.

e) Production Rates – For all non administrative that have shifted onto the critical path, or now have less than 20 days of Total Float, the Contractor shall enter the Production Rate information required in paragraph F.1.p. For any activities where the work to be performed is similar in nature to work already performed on the same project and that the Production Rate for the work to be performed is different than the actual Production Rate for work already performed the Engineer may require the Contractor to adjust the Duration for the work to be performed to reflect the more appropriate Production Rate.

f) Deleted work – If work has been deleted the corresponding work activities in the schedule shall be deleted. The Contractor shall not just zero the activity duration since the calendar assigned to the zero duration activity shall still affect the logic of future work activities.

g) The Project Scheduler can modify the project's Data Date through the Schedule tool.

h) The Contractor shall complete the following additional requirements based on the governing schedule type for the specific construction contract.

Type 2A. Monthly Progress Schedules

i) Data Date - the "Data Date" shall be the date the Project Scheduler last edits the schedule prior to submission to the Engineer (generally the last working day of the month).

ii) Submission frequency. The Contractor shall submit the schedule file and Narrative Report to the Engineer **monthly**. The schedule submission to the Engineer shall be made within three (3) Work Days of the last day of the month, whether or not the Engineer has accepted the previous Progress Schedule submission.

Type 2B. Bi-Weekly Progress Schedules

i) Data Date - the "Data Date" shall be the date the Project Scheduler last edits the schedule prior to submission to the Engineer (generally the 1st working day of the month, and the 16th day of the month).

ii) Submission frequency. The Contractor shall submit the schedule file and Narrative Report to the Engineer **bi-weekly**. The schedule submission to the Engineer shall be made by COB on the 2nd day of the month, and the 17th day of the month, whether or not the Engineer has accepted the previous Progress Schedule submission.

Type 2C. Weekly Progress Schedules

i) **Data Date** - the "Data Date" shall be the date the Project Scheduler last edits the schedule prior to submission to the Engineer (generally the last working day of the week (Saturday).

ii) **Submission frequency.** The Contractor shall submit the schedule file and Narrative Report to the Engineer **weekly**. The schedule submission to the Engineer shall be made by BOB on Monday of each week, whether or not the Engineer has accepted the previous Progress Schedule submission.

G. Detailed Narrative Requirements:

G.1. For the Baseline Progress Schedule. The Contractor shall include a narrative in Microsoft Word and/or Adobe Acrobat format that includes the following topics and attachments:

a) **Contract Identification.** Include the contract D number, project name, project location, and name of Prime Contractor.

b) **Key milestone dates.** Include the actual contract Award Date, original and adjusted contract Completion Date, Substantial Completion Date, and anticipated completion of all project work. Also include any contract Interim Milestone dates (I/D, B-Clock, LD, etc), and scheduled Start and Finish dates for those Milestone activities.

c) **General approach.** Describe the Contractor's general approach to construct the Work outlined in the baseline schedule. Address the reasons for the sequencing of work and describe any resource limitations, potential conflicts, and other salient items that may affect the schedule and how they may be resolved.

d) **Key Plans**. If not provided in the contract plans, or if modified by the Contractor, provide copies of the appropriate contract plan sheets marked up to correlate values on the contract plans (for Area of Work, Stage of Work, and WZTC Phase) to the Contractor's planned breakdown of the project (ie-Activity Codes, Activity Descriptions) for scheduling purposes.

e) **Logic Justifications.** The justification(s) for each activity with a duration exceeding 15 working days. The justification(s) for Contractor imposed activity constraints proposed in the schedule.
The reason for any lags assigned to any activities.

f) **Calendars.** Include a list of calendars which have been incorporated in the schedule, and for each calendar the general reason for it's use in the schedule.

g) **Critical Path issues.** A brief discussion of the critical path shown in Appendix 2, highlighting any potential challenges that are foreseen associated with the critical path work.

h) **Coordination issues.** Outline any anticipated coordination issues related to work activities by other entities that require additional information from, or action by, the Engineer.

i) **APPENDIX 1 – Scheduling/Leveling Report.** This appendix in Adobe Acrobat PDF file format, formatted to fit standard ANSI Size A (Letter) size paper (8.5 inch x 12 inch) (215 mm x 279 mm) paper, printed with portrait orientation, shall be included with the narrative as a separate file.
A complete Scheduling/Leveling Report (SCHEDLOG.TXT file generated by the Department's Oracle-Primavera scheduling software application) which includes the Schedule Settings, Statistics, Errors, Warnings, Scheduling/Leveling Results, Exceptions, Activities with unsatisfied constraints, Activities with unsatisfied relationships, and Activities with external dates. The statistics shall include, # of Activities, # of Activities Not Started, # of Activities In Progress, # of Activities Completed, # of Activity Relationships, and # of Activities with Constraints. Total number of activities on the critical path, percent complete, activities without predecessors, activities without successors, and activities out of sequence.

j) **APPENDIX 2 – Progress Schedule plot.** This appendix in Adobe Acrobat PDF file format, formatted to fit ANSI Size B (Ledger) paper (11 inch x 17 inch) (279 mm x 431 mm) paper, printed with Landscape orientation, shall be included with the narrative as a separate file.
Appendix 2 to the narrative shall be an electronic schedule plot (Adobe Acrobat format) using the Global Layout named "Baseline Schedule submission", with activities sorted by Start Date in ascending order, Grouping of activities by WBS, and only the "Longest Path" filter applied. This plot shall provide a clear critical path from the Data Date to the last activity in the schedule.

Graphical representations shall be shown at a suitable scale to be legible and readable.

G.2. For the Weekly/Bi-Weekly/Monthly Progress Schedule. For each Progress Schedule submission, the Contractor shall submit a revised narrative in Microsoft Word or Adobe Acrobat format that includes (but is not limited to) the information from paragraph G.1, and the following **additional** topics:

k) **Project Progress.** Discuss the progress that was made during the current reporting period, and document any Total Float gained or recovered during the period. For major work items describe the differences between the actual work performed and the work planned for the period as represented in the preceding Progress Schedule submission, including explanations for the deviations.

l) **Suspended Work.** For all suspended work activities that could otherwise logically be progressed, identify the responsible party prohibiting the progression of the work, as well as the detailed reasons why.

m) **Project Delays.** Discuss any delays experienced during the current reporting period. Quantify any relative change in Total Float for the project since the last Progress Schedule submission. For each activity on the critical path (include Activity ID's and Activity Descriptions) where work was delayed during the reporting period, provide the following detailed information including:

- the extent in days (negative float) of the delay, and events that caused the delay.
- the party(s) responsible for the delay event(s).
- the other activities in the construction schedule affected by the events.
- the reasonable steps needed to minimize the impact of the delay, and which party needs to take the action(s).

The Contractor is reminded of the requirements of Notice & Recordkeeping as found in §104-06 of the contract specifications and as they relate to Disputed Work. The Contractor shall include a copy of any notice provided to the Engineer for any time-related delay dispute as part of their narrative.

n) **Project Issues**. List any other problems experienced during this Progress Schedule submission period, the party responsible for the problems, and the Contractor's intentions to resolve the issue(s).

o) **Schedule changes.**

i) List of all added or deleted activities included in this Progress Schedule submission, and the reason(s) for and the impact(s) of such changes.

ii) List all changes in activity Original Durations, the justification for such change(s), and the impact(s) of such changes.

iii) List all changes in relationships between activities included in this Progress Schedule submission, and the reason(s) for and the impact(s) of such changes.

iv) List any addition or deletion of activity or project constraints, and the reason(s) for and the impact(s) of such changes.

v) List all changes to the project calendars, and the reason(s) for and the impact(s) of such changes.

p) List all activities for procurement of long lead time materials that are behind schedule and the reason(s) why.

q) Description of any changes to the critical path since the last Progress Schedule submission and the impacts of such changes.

r) The major work elements, as defined in the WBS, to be accomplished during the next monthly work period.

s) Any potential problems that are anticipated for the next monthly work period and the proposed solutions to such problems. Identify potential problems or risks that either the Department or Contractor may be potentially responsible for. Explain what action the responsible party (i.e. - Department or Contractor) needs to take and the date by which time the action needs to taken to avoid the problem.

t) Any planned acceleration of activities that the Contractor anticipates to undertake within the next monthly work period that either the Department directed, or that the Contractor believes is necessary.

u) The following appendix in Adobe Acrobat PDF file format, formatted to fit ANSI Size E paper (34 inch x 44 inch) (863 mm x 1117 mm) paper, printed with Landscape orientation, shall be included with the narrative as a separate file.

- APPENDIX 3 – A listing of all work activities as of the data date, using the NYSDOT Appendix 1 activity layout, sorted by Finish date, Total Float in increasing order, showing the Activity ID, Activity Name, Original Duration, Remaining Duration, Actual Duration, Total Float, Early Start date, Start date, Finish date, Late Finish date, and Calendar ID. The grouping of activities shall be by WBS. The Gantt Chart shall clearly indicate all activities in the schedule. Graphical representations shall be shown at a suitable scale to be legible and readable.
- APPENDIX 4 – A listing of work activities filtered by NoteBook Topics assigned as of the data date, sorted by Finish date and Total Float in increasing order, showing the Activity ID, Activity Name, and Notebook Topic. The grouping of activities shall be by WBS.

H. Schedule Submission Methodology. Progress Schedule submissions will only be considered complete when all documents and data have been provided to the Engineer.

H.1. When preparing a formal submission of the progress schedule, the Contractor shall make a copy of the current Progress Schedule and name it according to the file naming convention provided by the Department in Table 3.

H.2. File Naming Convention. The schedule filename shall conform to the requirements of Table 3.

Type 2A. Monthly Progress Schedules

TABLE 3A – Schedule Filename convention			
Progress Schedules	**1st Version**	**2nd Version**	**3rd Version**
Draft Baseline Progress Schedule	D26####-1DB	D26####-2DB	D26####-3DB
Baseline Progress Schedule @ Award	D26####-1BPS	D26####-2BPS	D26####-3BPS
Final Baseline Progress Schedule @ Award	D26####-1FB	D26####-2FB	D26####-3FB
Monthly Progress Schedule Submission #1	D26####-1SU**01**	D26####-2SU**01**	D26####-3SU**01**
Monthly Progress Schedule Submission #2	D26####-1SU**02**	D26####-2SU**02**	D26####-3SU**02**
Monthly Progress Schedule Submission #3	D26####-1SU**03**	D26####-2SU**03**	D26####-3SU**03**
Monthly Progress Schedule Submission #4	D26####-1SU**04**	D26####-2SU**04**	D26####-3SU**04**
As-Built Progress Schedule (Last Progress Schedule)	D26####-1AB	D26####-2AB	D26####-3AB
1st Time Impact Analysis	D26####-1TIA1	D26####-2TIA1	D26####-3TIA1
1st Recovery Schedule	D26####-1RS1	D26####-2RS1	D26####-3RS1

Type 2B. Bi-Weekly Progress Schedules

TABLE 3B – Schedule Filename convention			
Progress Schedules	**1st Version**	**2nd Version**	**3rd Version**
Draft Baseline Progress Schedule	D26####-1DB	D26####-2DB	D26####-3DB
Baseline Progress Schedule @ Award	D26####-1BPS	D26####-2BPS	D26####-3BPS
Final Baseline Progress Schedule @ Award	D26####-1FB	D26####-2FB	D26####-3FB
Month 1Bi-Weekly Progress Schedule Submission #1A	D26####-1SU**1A**	D26####-2SU**1A**	D26####-3SU**1A**
Month 1Bi-Weekly Progress Schedule Submission #1B	D26####-1SU**1B**	D26####-2SU**1B**	D26####-3SU**1B**
Month 2Bi-Weekly Progress Schedule Submission #2A	D26####-1SU**2A**	D26####-2SU**2A**	D26####-3SU**2A**
Month 2Bi-Weekly Progress Schedule Submission #2B	D26####-1SU**2B**	D26####-2SU**2B**	D26####-3SU**2B**
As-Built Progress Schedule (Last Progress Schedule)	D26####-1AB	D26####-2AB	D26####-3AB

1st Time Impact Analysis	D26####-1TIA1	D26####-2TIA1	D26####-3TIA1
1st Recovery Schedule	D26####-1RS1	D26####-2RS1	D26####-3RS1

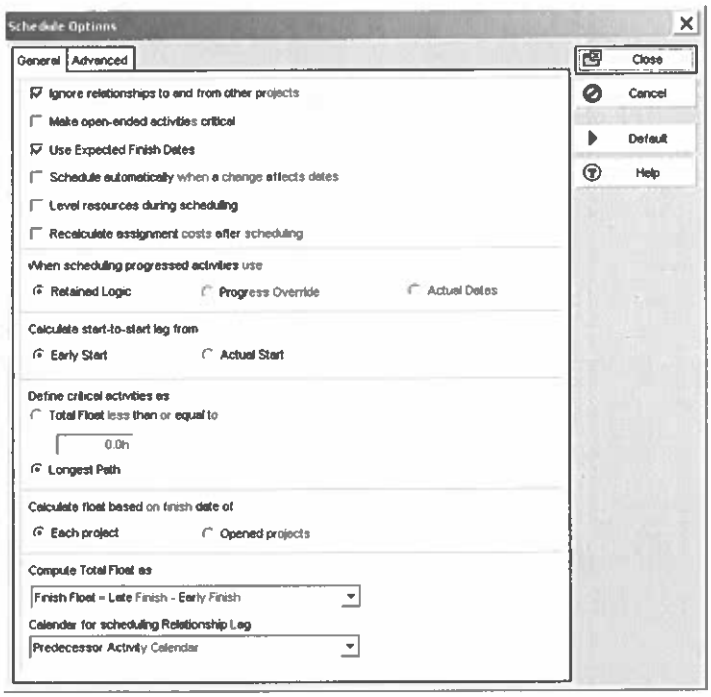
Type 2C. Weekly Progress Schedules

TABLE 3C – Schedule Filename convention			
Progress Schedules	**1st Version**	**2nd Version**	**3rd Version**
Draft Baseline Progress Schedule	D26####-1DB	D26####-2DB	D26####-3DB
Baseline Progress Schedule @ Award	D26####-1BPS	D26####-2BPS	D26####-3BPS
Final Baseline Progress Schedule @ Award	D26####-1FB	D26####-2FB	D26####-3FB
Month 1Weekly Progress Schedule Submission #1A	D26####-1SU1A	D26####-2SU1A	D26####-3SU1A
Month 1Weekly Progress Schedule Submission #1B	D26####-1SU1B	D26####-2SU1B	D26####-3SU1B
Month 1Weekly Progress Schedule Submission #1C	D26####-1SU1C	D26####-2SU1C	D26####-3SU1C
Month 1Weekly Progress Schedule Submission #1D	D26####-1SU1D	D26####-2SU1D	D26####-3SU1D
Month 2Weekly Progress Schedule Submission #2A	D26####-1SU2A	D26####-2SU2A	D26####-3SU2A
Month 2Weekly Progress Schedule Submission #2B	D26####-1SU2B	D26####-2SU2B	D26####-3SU2B
Month 2Weekly Progress Schedule Submission #2C	D26####-1SU2C	D26####-2SU2C	D26####-3SU2C
Month 2Weekly Progress Schedule Submission #2D	D26####-1SU2D	D26####-2SU2D	D26####-3SU2D
As-Built Progress Schedule (Last Progress Schedule)	D26####-1AB	D26####-2AB	D26####-3AB
1st Time Impact Analysis	D26####-1TIA1	D26####-2TIA1	D26####-3TIA1
1st Recovery Schedule	D26####-1RS1	D26####-2RS1	D26####-3RS1

The Project Scheduler can change the Project ID and Name through the WBS at the top node, as they do not have privileges to edit data through the Project Details tab.

H.3.Schedule the project. Immediately prior to submitting the schedule the Project Scheduler shall "Schedule" the project using the Scheduling Options shown below and in Figure 3, unless approval to vary from these settings is given by the Engineer. The Project Scheduler shall use the same Scheduling Options for all Progress Schedule submittals for the duration of the contract.

FIGURE 3



When entering the Data Date, the Contractor shall use the Date they last modified the schedule and the time entered shall be the end of the work day (generally 5pm) indicated on the project's default calendar.

H.4. Schedule Submission Delivery. The Contractor shall submit the schedule to the Engineer electronically for review and acceptance. The Contractor's submission shall be documented by an E-mail to the Engineer, with a copy to CPMSchedulingSection@dot.ny.gov and all appropriate project participants, that the project schedule on the network is ready for review. The Contractor's E-mail to the Engineer shall also consist of the following:

i) The subject of the E-mail shall include the Region #, contract D number, the Project Name, the Progress Schedule's ProjectID, and construction company name. (i.e. – Region 8, D260000, Rehabilitation of Main Street viaduct, D260000-01SU2, ABC Contractors)

ii) The E-mail message shall include the name of the EIC, the current anticipated Finish date of the last activity in the project schedule, a statement as to how that date compares to the current Contract Completion Date, and the name of the Area Construction Supervisor.

iii) Electronic files of all Narrative Reports and required attachments associated with the schedule shall be submitted by the Contractor in Adobe Acrobat format.

I. Progress Schedule Review and Analysis:

I.1. Immediate Rejection of Progress Schedule Submissions. The following deficiencies in a Contractor's progress schedule submission shall be grounds for the immediate rejection by the EIC, without further review, analysis and/or comments.

a) Failure of the Project Scheduler to "schedule" the project, as of the data date.

b) Failure to attach a copy of the complete Scheduling/Leveling Report (SCHEDLOG.TXT file generated by the Department's Oracle-Primavera software application).

c) Any activities without predecessors, or activities without successors, appearing in the Scheduling/Leveling Report with the exception of the first and last activity in the schedule.

d) Any activity constraints appearing in the Scheduling/Leveling Report that have not been approved in writing by the EIC, or that are not specifically allowed by this specification.

e) Any Activities with Actual Dates > Data Date appearing in the Scheduling/Leveling Report.

f) Any Milestone Activities with invalid relationships appearing in the Scheduling/Leveling Report.

g) Failure to have a clearly defined Critical Path from the Data Date to the last activity in the schedule, using the Longest Path method. This would reflect logic errors in the project schedule.

h) Failure to attach the schedule Narrative and required appendices.

i) Repeated failure to correct "Out-Of-Sequence" activities.

If any of these deficiencies are found, the Contractor's submission shall be considered deficient, and Engineer will notify the Contractor immediately by return E-mail of the rejection of the schedule submittal.

I.2. Schedule Analysis Method.

Events, actions, and progress that cause delays or gains to the Progress Schedule will be analyzed solely by the "Contemporaneous Period Analysis" method.

I.3. Department Review and Acceptance of Progress Schedules.

The Engineer will review the Monthly Progress Schedule submissions and will prepare a written response (Progress Schedule Review Report) to the Contractor's submission within five (5) Work Days following receipt of the Contractor's complete schedule submission. The Engineer will either "accept" the schedule, "accept as noted", or "reject" the schedule for re-submittal by the Contractor.

If the Progress Schedule submission is not in compliance with contract requirements, the Engineer may reject the submittal and shall forward any comments and requests for schedule revisions to the Project Scheduler by email, with a copy to the Contractor and to CPMSchedulingSection@dot.ny.gov. The Project Scheduler shall address all comments in writing and/or make the requested revisions, and resubmit the revised schedule within three (3) State Business days of the Engineer's reply. If the

Engineer determines the revised submission still does not meet the contract requirements, any further revisions required thereafter shall also be submitted for acceptance within (3) Work Days of the request for revisions by the Engineer.

For schedules that are "accepted as noted" the Engineer shall forward any comments, or requests for revisions, to the Contractor by email, with a copy to the CPMSchedulingSection@dot.ny.gov. The Project Scheduler shall address all comments in writing and/or make the requested revisions as part of the next scheduled Progress Schedule submission.

The Project Scheduler shall make adjustments to the Progress Schedule in accordance with the Engineer's comments and resubmit copies for review consistent with the requirements of this section.

The Engineer, by accepting the progress Schedule, does not agree that the Progress Schedule is reasonable or that by following the Progress Schedule the Contractor can complete the work in a timely manner. If, after a Progress Schedule has been accepted by the Engineer, either the Contractor or the Engineer discover that any aspect of the Schedule is on error, or something significant has been omitted, the Contractor shall correct the Progress Schedule in the next Progress Schedule submission and describe this revision in the Narrative report.

Acceptance of progress schedules by the Engineer shall not be construed to imply approval of any particular construction methods or sequence of construction or to relieve the Contractor from its responsibility to provide sufficient materials, equipment and labor to guarantee the completion of the contract in accordance with the contract documents.

Acceptance of the progress schedule by the Engineer does not attest to the validity of assumptions, activities, relationships, sequences, resource allocations, or any other aspect of the progress schedule. Within the contractual constraints, the Contractor is solely responsible for the planning and execution of the work.

Acceptance of the progress schedule by the Engineer shall not be construed to modify or amend the contract agreement or the date of completion therein. Completion dates can only be modified or amended by standard contractual means, through an official HC-250b Request For Extension of Completion Date.

If any resources are included in the Progress Schedule, it is not intended that the Engineer, by accepting the schedule should use the Contractor's resource data for anything other than determining the reasonableness of achieving the Contractor's production rates. Resources included with the accepted CPM schedule shall not be misconstrued as a cost benchmark for the performance of planned or actual work.

Once the progress schedule has been accepted, the Contractor shall not deviate from it without first notifying the Engineer in writing.

Upon receipt from the Contractor of the corrected schedule, a new review period by the Engineer of five (5) Work Days will begin.

J. Changes to Progress Schedule due to Added/Deleted/Changed Work:

J.1. Changes to the contract. In the event a notice of a change to the contract is received, the appropriate changes to the progress schedule shall be made, as necessary, to incorporate the anticipated added/deleted/changed work and the Contractor shall notify the Engineer in writing within 10 (ten) calendar days if there is any effect of such change to the schedule. Change to the contract includes, but is not limited to, Extra Work, Change Orders, Suspensions of Work Directed by the Engineer, Changed Condition, and Value Engineering Change Proposals. Added, deleted and/or extra work associated with Change Orders shall be reflected in the next Monthly Progress Schedule Submission in anticipation of and prior to the date in which the work physically takes place without regard to the dates when the actual Change Order was approved. The effect of the change to the contract on the projects Critical Path shall be stated. Extra work or additional work that does not affect the controlling operation on the critical path will not be considered as the basis for a time extension. All schedule activities effected by added, deleted or changed work that is included in a signed Order-On-Contract, Field Change Order, or Authorization of Extra Work (with the exception of minor quantity changes that do not impact contract milestones), or work activities performed by the Contractor at risk in anticipation of such Department approval, shall be

assigned the appropriate Activity Code (Added/Changed Work) and Code Value (sequentially numbered) to denote which "Changed Contract Work" order number correlates to those activities of work.

J.2. Time Impact Analysis.

For each request of an adjustment of contract time due to an anticipated change to future work in the Progress Schedule, when the Contractor or Engineer consider that an anticipated or approved change to the contract may impact the critical path and contract progress by more than a calendar month, the Contractor shall submit a Time Impact Analysis (TIA). The TIA shall be submitted as part of any Order on Contract (Change Order) and/or VECP if the critical path changes by more than a calendar month.

The TIA shall be based on a revised Progress Schedule and shall be submitted as an electronic file (using Microsoft Word for the narrative) containing:

a) The TIA shall illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate.
b) The analysis shall use the accepted Monthly Progress Schedule that has a data date closest to and prior to the event as the "Current Baseline", this shall then be compared against the "What-if Project Plan Baseline" for the purpose of the TIA.
c) If the Engineer determines that the accepted schedule used does not appropriately represent the conditions prior to the event, the accepted schedule shall be updated to the day before the event being analyzed.
d) The TIA shall include an impacted schedule ("What-if Project Plan Baseline") developed from incorporating the actual or anticipated event into the accepted schedule by adding or deleting activities, or by changing durations or logic of existing activities.
e) If the impact schedule shows that incorporating the event negatively modifies the critical path and scheduled completion date of the accepted schedule, and the Engineer accepts the impacted schedule, the difference between scheduled completion dates of the two schedules shall be equal to the proposed adjustment of contract time.
f) The Engineer may construct and utilize an appropriate project schedule or use another recognized method to determine adjustments in contract time until the Contractor provides the TIA.
g) The Contractor shall submit a TIA within fifteen (15) State Business Days of receiving a written request for a TIA from the Engineer.
h) The Contractor shall allow the Engineer ten (10) Work Days after receipt to accept or reject the submitted TIA. All accepted TIA schedule changes shall be included in the next Monthly Progress Schedule submission.
i) If a TIA submitted by the Contractor is rejected by the Engineer, the Contractor shall meet with the Engineer to discuss and resolve issues related to the TIA. If agreement is not reached, the Contractor will give notice in conformance with §104-06 Notice & Recordkeeping, and submit in accordance within the provisions in §105-14.E "Required Content of *Dispute Submissions*".
j) The Contractor shall only show actual as-built work, not unapproved changes related to the TIA, in subsequent Monthly Progress Schedules submissions. If agreement is reached at a later date, approved TIA schedule changes shall be included in the next Monthly Progress Schedule submission.
k) Request for a contract time extension will not be processed until the receipt and approval of a Time Impact Analysis.

K. Failure to Submit Progress Schedules and/or Recovery Schedules:

K.1. No progress payment for this item of work shall be made until the progress schedule is "accepted" or "accepted as noted" by the Engineer.

K.2. If the Contractor's Progress Schedule submission is rejected due to any deficiency noted in paragraph I.1(a) through (i), it shall be considered an incomplete submission and therefore substantially deficient.

K.3. If the Contractor's revised Progress Schedule submission does not address the written comments provided by the Engineer, and does not include a written explanation with a reasonable rational for not addressing those comments, the submission shall be considered deficient.

K.4. If the Contractor fails to submit a CPM Progress Schedule conforming to the provisions required under this specification, to the degree that such failure is deemed by the Regional Construction Engineer to

adversely affect the management of the project and/or the administration of the construction contract, liquidated damages will be assessed as determined under Basis of Payment.

L. Recovery Schedule

L.1 If the latest completion time for any work on the current Progress Schedule results in an activity being delayed ten percent or more of the time beyond the required Contract duration or any specified Milestone duration, as adjusted if appropriate, the Engineer may require the Contractor to submit a Recovery Schedule and written description of the plan to recover all lost time and maintain the required Completion Date or specified Interim Milestone Date(s).

L.2. With the Recovery Schedule the Contractor shall submit a narrative that identifies where additional labor and/or equipment resources will be allocated. Alternately, the Contractor may elect to provide the makeup of their Crew resources in the narrative, and assign those Crew resources to the appropriate activities in the Progress Schedule. The makeup of the Crew shall include the various Labor classes and equipment that comprise the Crew along with the quantity of each labor class and type of equipment. Equipment resources shall be shown for major or specialty equipment such as tower cranes, piledrivers, barges, asphalt pavers, concrete pavers, dozers, front end loaders, backhoes, rollers, excavators, graders, long line striping truck or other equipment that cannot be rented easily.

Either of these alternatives may be supplemented with a request for a Contract Time Extension. The Contractor shall provide a reasonable plan for accomplishing the work of the contract within the current completion date, or to the requested contract extension date. The Engineer will use the Recovery Schedule to evaluate time extensions, with or without charges.

M. Submission of progress schedules with projected Early Completion date(s):

The Contractor may indicate a projected early completion date on any progress schedule submission. If the Contractor desires reimbursement for delay damages caused by the Department in accordance with §109-05D *Time Related Dispute Compensation,* related to an early completion date, the Contractor shall be required to gain approval of a change to the contract completion date via a VECP in accordance with §104-10 *Value Engineering Change Proposals* of the Standard Specifications.

If the VECP is approved by the Department, and the contract completion date is revised to the Early Completion date via Change Order, then Standard Specification §108-03 will be superseded by the following:

> "If the Contractor fails to complete all contract work by the revised contract completion date, the Department may assess Engineering Charges but not Liquidated Damages for each calendar day that work on the project remains incomplete due to Contractor responsible delays, for the period of time after the revised contract completion date to the original contract completion date.
>
> The Department may further assess both Engineering Charges and Liquidated Damages, for each calendar day that work on the project remains incomplete due to Contractor responsible delays, for the period of time after the original contract completion date."

Furthermore, the Contractor waives its rights to compensation under §109-05D *Time Related Dispute Compensation* of the Standard Specifications for the period of time between the revised early contract completion date and the original contract completion date, regardless of the cause(s) for delay, by any party, if the Contractor has not submitted and received Department approval for a VECP Early Completion date change.

N. Float

During the course of contract execution, Total Float generated due to the efficiencies of either party (State or Contractor) will be considered project Float that is not for the sole use of the party generating the float; rather it is a shared commodity to be reasonably used by either party. Any party assigned activity responsibility within the schedule has the full use of the project Float until it is depleted.

METHOD OF MEASUREMENT:

The quantity shall be measured for payment on a Lump Sum basis.
The minimum lump sum bid for this item shall be the unit price shown in the itemized proposal.
Failure of the Contractor to bid at least the minimum amount will result in the Department adjusting the Contractor's bid to include the minimum bid amount for this item.

BASIS OF PAYMENT:

The lump sum price bid for CPM Progress Schedules shall include all labor, material, and equipment necessary to satisfactorily complete the work.

Progress payments will be made at 25 percent of the lump sum price bid upon acceptance of the Final Baseline Progress Schedule @ Award and the List of Submittals. 70 percent will be paid in subsequent contract payments, in proportion to the number of months remaining in the original contract duration, less any non-payment for substantial deficiencies. The remaining 5 percent will be paid upon acceptance of the As-Built Progress Schedule.

A. Non-Payment. No payment will be made for any Progress Schedule submitted more than twenty-one calendar days late. For each calendar day during which there are substantial deficiencies with the Progress Schedule no payment will be made. The amount of such non-payment will be 1/30th of the Monthly Payment Amount multiplied by the number of days there are substantial deficiencies.

B. Liquidated Damages. Liquidated damages will be assessed for each subsequent calendar day or part thereof that a cited deficiency resulting in non-payment is not corrected or is permitted to recur. Liquidated damages will be assessed at the rate equal to $1/10^{th}$ of the Monthly Payment Amount.

If an extension of time without the assessment of engineering charges and/or liquidated damages is approved, additional payment for CPM Progress Schedules will be made for each month the contract is extended.

If an extension of time with the assessment of engineering charges and/or liquidated damages is approved, no additional payment **will** be made for CPM Progress Schedules.

Payment will be made under:

Item No.	Item	Pay Unit
639.21010011	CPM (Critical Path Method) Progress Schedule – Type 2A	LS
639.22010011	CPM (Critical Path Method) Progress Schedule – Type 2B	LS
639.23010011	CPM (Critical Path Method) Progress Schedule – Type 2C	LS

ITEM 645.5YXX0110 - GROUND MOUNTED SIGN PANELS BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.6Y000110 - OVERHEAD SIGN PANEL BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.71000110 – NON-REFLECTIVE SHEETING
ITEM 645.72000110 – POWDER COATED STIFFENERS, BRACKETS, AND MISCELLANEOUS HARDWARE

DESCRIPTION

This work shall consist of furnishing and installing signs and guide panels with non-retroreflective, colored sign sheeting applied to the back of the panel and, when required, powder-coated stiffeners, overhead brackets and miscellaneous hardware.

MATERIALS

The following sections of the standard specifications shall apply:

Signs	645-2

with modifications as noted below.

The following ASTM specifications shall apply

Standard Test Method by Adhesion Tape	D3359
Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers	D4541

The following other specifications shall apply:

Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)	AAMA 2605

Sign Sheeting For Panel Backs: shall meet the following requirements:

- Cast vinyl material
- Non-retroreflective
- Have a guaranteed service life of at least 5 yrs or 7 yrs
- Supplied with a pre-coated, pressure-sensitive or heat-activated adhesive back and protected by a removable liner.
- Show no signs of shrinkage, delamination, cracking or other surface defects

ITEM 645.5YXX0110 - GROUND MOUNTED SIGN PANELS BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.6Y000110 - OVERHEAD SIGN PANEL BACKED WITH NON-RETROREFLECTIVE SHEETING
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- color shall be Federal Standard Color box shall be 595-B or 595-C:
  - # 20059
  - # 34066, or
  - As specified in the contract documents
- Be from one of the following manufacturers:

Oracal 951 Premium Cast
as manufactured by
ORAFOL Americas – GA
1100 Oracal Parkway
Black Creek, GA 31308
888.672.2251
www.orafolamericas.com

3M – Scotchal Electrocut 7725
as manufactured by
3M Center
Building 220-12E-04
St. Paul, MN 55144-
800.328.3908
www.3M.com/graphics

SC 900 Super Cast Series
as manufactured by
Avery Dennison Graphics Solutions
8080 Norton Pky
Mentor, Ohio 44060
800.282.8379
graphics.averydennison.com

Hi-S Cal 4178 Series
as manufactured by
Nikkalite
12981 East Florence Avenue
Santa Fe Springs, CA 90670
800.821.4264
www.nikkalite.com

or equal as approved by the Engineer

Submit a sample of the proposed sheeting and powder-coated stiffener, bracket and miscellaneous hardware in the specified color for approval before sign fabrication.

Powder-Coating for Stiffeners, Brackets and Miscellaneous Hardware:
Powder-coating shall be done to manufacturer's recommendations. The coating powder shall be polyester-based powder that has been tested and certified to meet the AAMA 2605 specification and designed for use over properly prepared aluminum and galvanized surfaces.

ITEM 645.5YXX0110 - GROUND MOUNTED SIGN PANELS BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.6Y000110 - OVERHEAD SIGN PANEL BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.71000110 – NON-REFLECTIVE SHEETING
ITEM 645.72000110 – POWDER COATED STIFFENERS, BRACKETS, AND MISCELLANEOUS HARDWARE

Basis of Acceptance
Signs will be accepted on the basis of material certification(s) that the products are consistent with and conform to the requirements this specification.

CONSTRUCTION DETAILS
The following sections of the standard specifications shall apply:

Signs	645-3.01 and -3.02

with the following modifications:

NON-RETROREFLECTIVE SHEETING
- Apply non-retroreflective sheeting to the back of the sign panels according to sheeting manufacturer's recommendations, including following manufacturer's recommendation for cleaning and applying the sheeting.

POWDER COATED STIFFENER, BRACKET AND MISCELLANEOUS HARDWARE
- If the use of Z-bars and/or batten bars is specified, powder coat the Z-bars and batten bars to the approximate color of the non-retroreflective sheeting and in accordance with the powder coating manufacturer's recommendations.
- The powder-coating process shall be performed according to the powder manufacturer's printed instructions. All coated items shall demonstrate a coating thickness between 1.5 to 2.5 mils (38-63) microns or a thickness recommended by the powder manufacturer or applicator, whichever is higher. All surfaces to coated shall be prepared in strict accordance to the powder manufacturer's instructions. Any required pre- or post-heating/curing of the powder shall be performed in strict accordance with such instructions.
- The final coat shall exhibit a 5A or 5B adhesion when tested according to ASTM D3359, or a minimum of 600 psi adhesion when tested according to ASTM D4541. All powder coated items shall demonstrate excellent edge coverage on all holes and edges. The color of the powder coating shall match the color specified under Materials, Sign Sheeting for Panel Backs when viewed under sunlight.
- Protect the powder coated hardware and both faces of the completed sign panels during delivery and installation.

ITEM 645.5YXX0110 - GROUND MOUNTED SIGN PANELS BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.6Y000110 - OVERHEAD SIGN PANEL BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.71000110 – NON-REFLECTIVE SHEETING
ITEM 645.72000110 – POWDER COATED STIFFENERS, BRACKETS, AND MISCELLANEOUS HARDWARE

- When powder-coated stiffeners, brackets and miscellaneous hardware are installed on existing sign panels, the Contractor shall remove existing stiffeners, brackets and miscellaneous hardware and install new material in a manner that does not mar the powder coating.

METHOD OF MEASUREMENT

The work will be measure as the number of square feet, measured to the nearest 0.1 square foot of (ground-mounted or overhead) sign panel backed with non-retroreflective sheeting and powder coated stiffeners, brackets and miscellaneous hardware furnished and installed.

When non-retroreflective sheeting and/or stiffeners, brackets and hardware are specified independent of a sign, the work will be measured as the number of square feet, measured to the nearest 0.1 square foot, of the sign (ground-mounted or overhead) for which these materials are furnished and installed.

The area of each panel will be measured as the area shown on the standard sheets. For sign panels not shown on the standard sheets, the area will be measured as the product of the length and width, with no reduction for rounded corners.

BASIS OF PAYMENT

The unit price bid per square foot of sign panel backed with non-retroreflective sheeting and, where applicable, powder-coated stiffeners, brackets and miscellaneous hardware furnished and installed shall include the cost of all materials, equipment and labor necessary to satisfactorily complete the work.

The unit price bid per square foot of non-retroreflective sheeting and/or powder-coated stiffeners, brackets and miscellaneous hardware furnished and installed shall include the cost of all materials, equipment and labor necessary to satisfactorily complete the work.

All other sign provisions and mountings will be paid for separately under respective payment items.

ITEM 645.5YXX0110 - GROUND MOUNTED SIGN PANELS BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.6Y000110 - OVERHEAD SIGN PANEL BACKED WITH NON-RETROREFLECTIVE SHEETING
ITEM 645.71000110 – NON-REFLECTIVE SHEETING
ITEM 645.72000110 – POWDER COATED STIFFENERS, BRACKETS, AND MISCELLANEOUS HARDWARE

Payment will be made under the following payment items:

Item Number	Description	Unit
645.51010110	Ground-Mounted Sign Panels without Z-bars with Non-Retroreflective Sheeting	SF
645.51020110	Ground-Mounted Sign Panels less than or equal to 30 SF with Non-Retroreflective Sheeting and Powder Coated Stiffeners, Brackets and Miscellaneous Hardware	SF
645.51030110	Ground-Mounted Sign Panels greater than 30 SF with Non-Retroreflective Sheeting and Powder Coated Stiffeners, Brackets and Miscellaneous Hardware	SF
645.52010110	Ground-Mounted Sign Panels with High Visibility Sheeting and Non-Retroreflective Sheeting without Z-bars	SF
645.52020110	Ground-Mounted Sign Panels less than or equal to 30 SF with High Visibility Sheeting, Non-Retroreflective Sheeting and Powder Coated Stiffeners, Brackets and Miscellaneous Hardware	SF
645.52030110	Ground-Mounted Sign Panels greater than 30 SF with High Visibility Sheeting, Non-Retroreflective Sheeting and Powder Coated Stiffeners, Brackets and Miscellaneous Hardware	SF
645.61000110	Overhead Sign Panels with Non-Retroreflective Sheeting and Powder Coated Stiffeners, Brackets and Miscellaneous Hardware	SF
645.62000110	Overhead Sign Panels with High Visibility Sheeting, Non-Retroreflective Sheeting and Powder Coated Stiffeners, Brackets and Miscellaneous Hardware	SF
645.71000110	Non-Retroreflective Sheeting	SF
645.72000110	Powder Coated Stiffeners, Brackets and Miscellaneous Hardware	SF

ITEM 655.05010008 - STANDARD SANITARY MANHOLE FRAMES AND COVERS (CASTINGS)
ITEM 655.05020008 - WATERTIGHT SANITARY MANHOLE FRAMES AND COVERS (CASTINGS)

DESCRIPTION:
This work shall consist of furnishing and installing frames and covers for sanitary sewer manholes as shown on the plans or as directed by the Engineer.

MATERIALS:
All of the provisions of Section 655-2.01 Castings shall apply, except the materials shall comply with the Owner Requirements for Sanitary Sewer Mains and Appurtenances special note found in the contract proposal.

CONSTRUCTION DETAILS:
The requirements of Section 655-3 Construction shall apply.

METHOD OF MEASUREMENT:
This work will be measured as the number of frames and covers furnished and placed.

BASIS OF PAYMENT:

The unit price bid for frames and covers shall include the cost of furnishing all labor, materials and equipment necessary to satisfactorily complete the work, including the cost of any field repair work for improperly fitting castings or to render the frame and cover non-rocking.

Payment will be made under:

ITEM NUMBER	ITEM DESCRIPTION	UNIT
655.05010008	Standard Sanitary Manhole Frames and Covers (Casting)	Each
655.05020008	Watertight Sanitary Manhole Frames and Covers (Casting)	Each

9/17/03
USC 12/16/15

ITEM 660.93000008 - FURNISH AND INSTALL SANITARY SEWER LATERALS

DESCRIPTION:

Under this item the contractor shall furnish and install sanitary sewer laterals at locations shown in the plans, specifications and/or as directed by the Engineer.

MATERIALS:

The size and type of pipe used to connect to the sewer main shall meet the requirements of the items shown on the plans.

Excavation and backfill shall be done in accordance with the requirements of Items 206.0201 and 203.07, respectively.

All materials furnished and work performed shall be in accordance with the standards, requirements and regulations of the agency having jurisdiction over the sewer on which the work is to be performed.

CONSTRUCTION DETAILS:

The work shall include the following:

1) Excavation at locations indicated in the plans or as directed by the Engineer.

2) Complete installation of new sewer pipe, from main to property line at locations indicated in the plans or as directed by the Engineer.

3) Testing new pipe joints for tightness and meeting any inspection requirements of the agency having jurisdiction and/or the Engineer.

4) Backfill and compact all trenches to finish grade and dispose of excess materials as directed by the Engineer.

5) Plug the end of the pipe and stakeout its location for the property owner.

METHOD OF MEASUREMENT:

The quantity to be paid for shall be the number of sanitary sewer laterals furnished and installed in accordance with the plans or as directed by the Engineer.

BASIS OF PAYMENT:

The unit price bid shall include the cost of furnishing all labor, materials and equipment necessary

ITEM 660.93000008 - FURNISH AND INSTALL SANITARY SEWER LATERALS

to complete the work. Excavation and backfill shall be included in the cost of this item. Progress payments will be made at the unit price bid for 80 percent of the quantity of pipe installed. The remaining 20 percent will be paid for when the testing of the system has been completed.

ITEM 660.97020011 – SANITARY SEWER CLEANOUTS

DESCRIPTION:

This work shall consist of furnishing and installing a Sanitary Sewer Cleanout system at the location shown in the plans, specifications and/or as directed by the Engineer.

Sanitary Sewer Cleanout shall be defined as any bends, tees, crosses, reducers, caps, plugs, sleeves, or other pieces necessary to complete the installation. Where AWWA or ANSI specifications are noted, the most recent revision of that specification shall apply.

MATERIALS:

A. Concrete Manhole. The manhole shall conform to Section 604-2 Materials of the NYSDOT Standard Specifications. Dimensions shall be as shown on the Plans or as ordered by the Engineer.

B. Fittings. Fittings shall conform to AWWA C110. All pipe and fittings shall be lined with cement-mortar on the inside and shall have a petroleum asphaltic coating on the outside. The cement-mortar lining shall conform to AWWA C104. The thickness of the lining shall be double the standard thickness required by this Specification.

C. Pipe and Fitting Joints. Pipe and fitting joints shall be rubber gasket joints, either the mechanical type or the push-on type, and shall conform to AWWA C111.

D. Bedding for pipe: as shown on Contract Drawings

CONSTRUCTION DETAILS:

A. General. All work shall be done in accordance with the Plans and the Specifications, and shall be satisfactory to the Engineer and the owner of the sanitary sewer system.

The Contractor shall make all necessary arrangements, obtain all permits, and pay all charges as required to satisfy the requirements and regulations of the local sewer department.

Before the start of work, the Contractor shall prepare and submit for approval to the Engineer, schedules of the proposed sequence of work and drawings or catalog cuts of the sewer pipes, details of the connection to the sanitary sewer utility service and appurtenances comprising the work.

The Contractor shall, as directed by the Engineer, provide temporary connection when the sanitary sewer service is interrupted and shall notify the user sufficiently in advance of this interruption.

B. Excavation and Backfill. Installation details and payment lines shall be as shown on the NYSDOT Standard Sheet entitled "Installation Details for Reinforced Concrete and Other Rigid Pipes".

C. Pipe Installations. Excess coating, blisters, etc., shall be removed from the bell and spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire brushed and wiped clean and dry before the pipe is laid.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed. All pipe connections shall be made in the trench. No joining of pipes will be allowed before lowering and setting in the trench. Pipe shall be placed with bell ends facing in the direction of laying. The spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade.

METHOD OF MEASUREMENT:

The work to furnish and completely install the sanitary sewer cleanout will be measured on a Lump Sum basis.

BASIS OF PAYMENT:

Payment will be made at the contract Lump Sum price and shall include all labor, equipment, materials, testing, documentation, utility fees, and labor detailed in the contract documents for this bid item.

ITEM 660.97100010 - PRECAST SANITARY SEWER MANHOLE

DESCRIPTION

This specification covers the requirements for furnishing and installing complete sanitary sewer manholes as shown on the plans and in accordance with these specifications.

MATERIALS

Materials used for the construction of the sanitary sewer manholes shall be as indicated on the plans, and shall conform to the requirements of the following:

Cast-In-Place Concrete (Class A).....Section 501
Mortar for Concrete Masonry.....Section 705-21
Bar Reinforcement, Grade 420.....Section 709-01
Frames and Grates.....Section 655
Concrete Brick.....Section 704-02
Precast Concrete Drainage Units.....Section 706-04

In addition, precast manhole sections shall be of round configuration, constructed in conformance with the details shown in the Contract Documents and the applicable sections of ASTM Designation C478. In case of conflict, the details included in the Contract Documents shall govern. All sections of precast manholes shall be provided with at least three (3) lifting anchors, details of which shall be submitted to the Engineer for approval before casting.

Inlet and outlet provisions for precast manholes shall conform to details included in the Contract Documents.

Manholes constructed of precast concrete with a circular interior are to conform to ASTM designation C478 except that walls of 48 inches diameter barrels shall have a thickness of 5 inches. Joints shall be made with flexible gaskets conforming to ASTM C361.

Concrete for manhole invert fill shall be Class A Concrete.

A. Quality Assurance

1. General

   a. The State reserves the right to inspect and test all precast concrete manhole components, accessories, and joint material upon delivery to the site and/or at the point of manufacture.

   b. All precast concrete manhole sections delivered to the job site shall be clearly marked at the factory with the date of manufacture and the manufacturer's identification. Omission of this information may be cause for rejection of the manhole sections.

c. The State reserves the right, at all times, to have its representative inspect the materials, the processes of manufacture, the records of analysis and tests, and to select the test specimens at the place of manufacture of the precast manhole sections.

d. The Contractor shall conduct leakage tests in accordance with the requirements specified in the "Leakage Tests" Section of these Specifications.

2. Manufacturer's Testing

a. All sampling and testing shall be in accordance with Section 501 - Cast-in-Place Concrete (Class A) and Section 706-04 - Precast Concrete Drainage Units.

b. Manhole components *shall not* be shipped prior to attaining the specified twenty- eight (28) day compressive strength.

c. Manhole components *shall not* be shipped unless they bear a stamp of approval by the State or as ordered by the Engineer.

B. Submittals

1. Shop Drawings

a. Shop drawings shall be submitted for all manholes, manhole castings, and manhole accessories. The Contractor shall submit to the Engineer, with such promptness as to cause no delay in the work, or in the work of any other Contractor, seven (7) copies of all shop drawings for all manhole sections and appurtenances specified herein, and no work shall be fabricated until the Engineer's approval has been given. All shop drawings, cuts, catalogs, or other data requiring approval must be submitted to the Engineer by the Contractor and must bear his stamp of approval evidencing that the data have been checked. Drawings, cuts, catalogs, or other data submitted without his stamp of approval will not be considered by the Engineer and will be returned to the Contractor. Likewise, all questions concerning the plans and specifications which require clarification or interpretation shall be submitted in writing to the Engineer through the Contractor.

The Contractor shall make corrections in the drawings required by the Engineer and shall file with the Engineer seven (7) corrected copies. Approval by the Engineer of such drawings shall not relieve the Contractor of responsibility for errors of any sort in shop drawings; or for deviations

from plans and specifications unless the Contractor, at the time of submission of said drawings, has given notice to the Engineer of such deviations.

b. Shop drawings shall include, but not be limited to, the following information:

(i) Size and spacing of steel reinforcement.

(ii) Wall and slab thickness.

(iii) Concrete cover over steel reinforcement.

(iv) Joint design between component manhole sections, show all dimensions.

(v) Concrete mix design including design compressive strength.

(vi) Design of flexible manhole seal assemblies.

(vii) Details of manhole ladders, attachments and supports.

2. Design Calculations

a. Design calculations, conforming to the applicable requirements of the American Concrete Institute Standard ACI318, shall be submitted by the Contractor to verify that all components of the manhole will have the required strength to withstand the following loadings:

(i) All manholes shall be of sufficient strength to withstand a minimum load produced by the prevailing earth pressure plus hydrostatic pressure in areas subject to ground water.

(ii) The maximum Live Load produced by H20-44 Loading as stipulated in the American Association of State Highway Transportation Officials (AASHTO).

b. All manholes in areas of high ground water or affected by tidal conditions shall be designed with a factor of safety of 1.25 against uplift.

c. All calculations shall be certified by a Professional Engineer registered in the State of New York.

C. Castings

1. All manhole frames and covers shall conform to the requirements of Section 655, "Frames and Grates" of the New York State Standard Specifications and the details shown on the plans.

2. The manhole frames and covers shall be of the adjustable type, as shown on the Contract Plans.

D. Manhole Collars

1. General

   a. Brick masonry shall be installed between the precast concrete manhole top slab and the manhole casting as shown on the Contract Plans in order to set the manhole casting at the proper grade.

   b. Precast concrete collar rings may be substituted for brick masonry subject to shop drawing submittal and approval.

2. Brick

   a. All brick shall meet the requirements stated in Section 704-02, "Concrete Brick" of the New York State Standard Specifications.

3. Mortar

   a. All mortar required to complete brick masonry as shown on the Contract Plans shall be in conformance with the requirements stated in Section 705-21, "Masonry Mortar" of the New York State Standard Specifications.

E. Steel Reinforcement

1. Steel reinforcement shall be placed in the various sections of precast manholes as shown on the Contract Plans. All steel reinforcement shall meet the requirements specified in Section 709-01, "Bar Reinforcement-Grade 420" of the New York State Standard Specifications.

F. Precast Concrete Top Slabs

1. The precast reinforced concrete top slab placed on the top of the manhole chimney shall be manufactured in accordance with the detail shown on the contract plans. The concrete used in the manufacturing of these slabs shall be minimum 4.35 ksi concrete as specified under Section 706-04, "Precast Concrete Drainage Units" of the New York State Standard Specifications.

G. Precast Concrete Chimney

1. General

   a. The precast reinforced concrete chimney shall be 48 inches diameter reinforced concrete pipe meeting the requirements of ASTM C478, having a minimum wall thickness of 5 inches.

2. Joints

   a. Joints between precast reinforced concrete chimney sections shall be of the bell and spigot type with a preformed plastic sealing compound gasket as specified in the Federal Specifications SS-S-210A. Joints shall be formed so that adjacent manhole sections will fit and seat properly. Gap between sections shall be no more than 3/8 inches.

H. Precast Manhole Base

1. General

   a. Concrete used in the manufacture of precast reinforced concrete manhole bases shall meet all the requirements specified for precast concrete in Section 706-04, "Precast Concrete Drainage Units" of the New York State Standard Specifications.

2. Pipe Connections

   a. The precast reinforced concrete manhole base shall be provided with circular openings at the locations and elevations for the proper connection of pipes. The pipe connections shall be sealed with flexible manhole seal assemblies.

   b. The flexible manhole seal assemblies shall be installed in accordance with the recommendations of the seal assembly manufacturer and shall conform to ASTM C923-79.

   c. Flexible manhole seal assemblies shall permit at least an eight (8) degree deflection from the center line of the opening in any direction while maintaining a watertight connection.

   d. The flexible manhole seal assemblies shall be as manufactured by Interpace Corp. (Lock Joint Flexible Manhole sleeve), National Pollution Control Systems, Inc. (Kor-N-Seal) or Press-Seal Gasket Corp. or approved equal.

3. Cast-In-Place Concrete Invert

a. The cast-in-place concrete invert shall be formed within the precast concrete manhole base with 4.35 ksi concrete conforming to the Specifications of Section 501, "Portland Cement Concrete - General" of the New York State Standard Specifications. This concrete shall be Class A.

4. Crushed Gravel Foundation

a. Crushed gravel foundations shall be provided under manhole bases as shown on the contract plans. The crushed gravel shall meet the requirements specified in Section 703-02, "Coarse Aggregates" of the New York State Standard Specifications. This crushed gravel shall be of the size designation as indicated on the plans.

CONSTRUCTION DETAILS

A. Preparation

1. Excavation

a. All excavation required for the construction of manholes shall be performed in accordance with Subsection 206-3, "Construction Details" of the New York State Standard Specifications.

2. Dewatering

a. All measures required to keep the excavation dewatered during pipe installation shall be included under Trench and Culvert Excavation. The Contractor is directed to the proposal for special notes regarding dewatering.

B. Backfill

1. All backfilling required for the construction of manholes shall be performed in accordance with the requirements of Subsection 203-3.15, "Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables" of the New York State Standard Specifications.

C. Precast Manhole Base

1. For precast manhole bases, the area underneath the manhole base shall be excavated to the required elevation. The soil below the base shall not be disturbed. The manhole base shall then be lowered into the trench and checked for proper bearing on the subgrade, proper elevation and orientation to receive the incoming and outgoing sewers at the designated invert elevation. If the invert elevation varies by

more than plus or minus ½ inch from the designated invert elevation, the base shall be removed and reset.

2. The concrete invert fill shall be installed following the connection of all sewer pipes to the manhole. The invert fill shall be true to the sewer pipe invert elevations, with smooth channels of uniform cross section and slope, either straight or with a continuous curve between inlet and outlet of pipes.

   The concrete invert fill shall be placed in accordance with dimensions and details shown on the Contract Plans.

   To eliminate free fall conditions in a manhole resulting from invert elevation differentials between incoming and outgoing pipes, the Contractor shall form and construct suitable channels in the bottom of the manhole connecting the inverts.

D. Joints Between Manhole Sections

1. All joints between the various manhole sections, including chimneys and top slabs, shall be made with a bell and spigot configuration with a preformed plastic sealing compound as specified in the Federal Specification SS-S-210A.

E. Manhole Collars

1. The brick masonry or precast concrete collar be constructed on the Precast Concrete Top Slab to bring the manhole frame and cover to the proper grade in accordance with the detail on the Contract Plans. The minimum height shall be 4 inches and the maximum height shall not exceed 16 inches.

2. Following the placement of the brickwork, a ½ inch layer of Portland cement mortar shall be applied to the exterior surface of the brick and trowelled to a smooth finish.

F. Castings

1. Manhole castings shall be set in a bed of Portland cement mortar on masonry collars as shown in the contract plans. The rim elevation shall be as determined by the Engineer.

G. Leakage Tests

1. Definitions

   a. For leakage test purposes, a section of sewer line shall be construed as being that portion of a sewer line between two (2) consecutive manholes inclusive

of upstream manhole and appurtenances unless otherwise specified.

2. Submittals

   a. The Contractor shall submit a schedule of lines to be tested and the methods and equipment to be utilized in the testing to the Engineer for approval.

   b. In areas requiring dewatering, the Contractor shall submit to the Engineer prior to starting the dewatering pumps, a record of each observation well as specified in the Dewatering Section of these Specifications.

   c. The Contractor shall be required to notify the Engineer not less than forty-eight (48) hours prior to the time he intends to begin testing at any particular location.

   d. Prior to undertaking any repairs, the Engineer's written approval of method and material to be used in the repair shall be secured. Items which in the opinion of the Engineer cannot be repaired shall be replaced.

3. General Parameters

   a. All gravity and pressure sewer lines, including but not limited to pipe, fittings, manholes, risers, stubs, specials an appurtenances shall be tested for water tightness as hereinafter specified.

   b. The Contractor shall furnish all necessary material, equipment, labor and other facilities required to satisfactorily perform the tests and shall make all necessary repairs or replacements and retests as required at his own expense.

   c. In areas requiring dewatering, groundwater observation wells shall be utilized for monitoring ground water levels prior to and during all leakage testing.

   d. The Contractor is warned that the Engineer may refuse to allow exfilration testing, or void those already underway if, in his judgment, heavy rain or rainwater inflow will distort test results. Retests of the affected lines shall be done at no cost to the County, State or other agency having jurisdiction. No claims for delays will be considered by the County, State or other agency having jurisdiction, in the event testing is suspended by the Engineer, as specified above.

4. Preparation

   a. General

(i) All sewer pipes and manholes must be clean prior to any work described in this section. They shall be free from dirt, debris, sand, stones, etc. and accumulated water must be removed.

5. Manholes

a. The testing of new manholes will be performed using the water exfilration test only. Air pressure testing on manholes will not be accepted.

b. Prior to the test, all pipes in the new manhole to be tested shall be plugged. All plugs shall be installed in the presence of the Engineer or his representative. Each new manhole shall be filled with water to a level not less than 24 inches above the exterior crown of the upstream pipe or above the normal groundwater level whichever is higher.

c. A one (1) hour stabilization period will be permitted to allow for water absorption by the manhole. This stabilization period may be extended with the permission of the Engineer. Water *shall not* be allowed to remain in the manhole overnight. Should the water level during the stabilization period drop below the test level as specified above, the Contractor, in the presence of the Engineer or his representative shall add make-up water for water lost during the stabilization period to increase the water level to the required height for the test.

d. The actual test period shall begin following the stabilization period. Addition of make-up water will not be allowed once the test has begun. *Any deviation* from the aforementioned will *void* the test.

e. The test be conducted for a period of five (5) hours. The Engineer or his representative will take three (3) readings of the water level at the beginning of the test period, and another three (3) readings of the water level at the end of the test period. The average of the readings will be used by the Engineer to calculate the leakage quantity.

f. The maximum allowable quantity of exfiltration from any manhole under test shall not exceed ½ gal per 12 inches diameter of manhole per 12 inches of water depth measured from the invert of the downstream pipe per twenty-four (24) hours.

6. Repairs and Retest

ITEM 660.97100010 - PRECAST SANITARY SEWER MANHOLE

a. General

(i) Prior to making any repairs, the Contractor shall submit to the Engineer, in writing, the proposed method of repair and secure his written approval of methods and material to be incorporated in the repair. The Engineer shall be the sole judge as to whether the pipes or manholes shall be repaired or replaced.

(ii) All repairs and retesting must be made in the presence of a representative of the Engineer and to the satisfaction of the Engineer.

(iii) Should a section or sections of pipe, or manholes fail to meet the leakage criteria, the Contractor shall at no cost to the County, State, or other agency having jurisdiction, locate the leaks and repair pipe and manholes, as necessary, until the leakage is within the permitted allowance.

(iv) Regardless of the results of the infiltration test, it is required that all visible leaks be repaired.

(v) The injection of gel, sealant, or any other product to seal cracks, porous section, or any other structural defect of the pipe or manhole will not be permitted.

b. Retests

(i) All tests and repairs shall be repeated as many times as necessary, at no cost to the County, State or other agency having jurisdiction, until the requirements hereinbefore specified have been met.

METHOD OF MEASUREMENT

The quantity to be measured under this item will be the number of linear feet of height, measured to the nearest tenth of a foot, from the bottom of the bottom slab to the top of the masonry.

BASIS OF PAYMENT

The unit price bid per foot shall include the cost of all labor, equipment, and materials necessary to complete the work including flexible gaskets between manhole sections, concrete invert fill, and all necessary testing and any repairs to the manhole required in connection with the sewerage tests on the manhole.

Manhole frames and covers will be paid for separately.
Excavation (dewatering included in Excavation), backfill, crushed gravel, geotextile and any necessary sheeting will be paid for separately.

ITEM 663.51000004 – FURNISH AND INSTALL NEW WATER VALVE BOX
ITEM 663.52000004 – REMOVE EXISTING WATER VALVE BOX
ITEM 663.53000004 – REPLACE EXISTING WATER VALVE BOX TOP SECTION

DESCRIPTION

Work consists of installation of water valve box as required in Contract Documents and as directed by Engineer.

The work shall be in conformance with the requirements of NYSDOT Standard Specifications Section 663 Water Supply Utilities.

MATERIALS

The provisions of the NYSDOT Standard Specifications Section 663, latest revision, and the contract documents shall apply.

CONSTRUCTION DETAILS

The provisions of the NYSDOT Standard Specifications Section 663, latest revision, and the contract documents shall apply with the following modifications:

GENERAL – Prior to adjusting or installing water valve box on water valve which is to remain in service, water valve shall be operated by the Bureau of Water to ensure that it is functioning properly. A water valve that does not function properly shall be replaced only as approved by the Engineer. Water valves are to be operated only by authorized representatives of the Bureau of Water.

INSTALLATION – An existing water valve box that is found damaged, not of sufficient length to be raised to the required finished grade, or determined by the Bureau of Water to be in need of replacement, shall be removed and replaced with a new water valve box assembly.

Water valve box shall be carefully set over the stem. Top section shall be adjustable for elevation, and the base centered over the operating nut. Water valve box shall be carefully set and braced to ensure that it remains in a vertical position centered on the stem during and after backfilling. Proper alignment and height of water valve box shall be maintained, until completion of the Project. Top of the water valve box shall be flush with the finished grade. Backfilling of the trench shall be done in a manner so as to avoid damage to the water valve and water valve box.

Upon completion of the work, the excavation shall be backfilled and the surface area restored.

REMOVAL OF EXISTING WATER VALVE BOX ASSEMBLY – Existing water valve box on abandoned water valve shall be removed to a minimum of 18 inches below the finished grade.

INSTALLATION OF NEW WATER VALVE BOX ASSEMBLY – Existing water valve box shall be removed and a new water valve box assembly installed. New water valve box shall be

carefully set over the existing stem, the base centered over the operating nut and the top section adjusted for elevation.

REPLACEMENT OF WATER VALVE BOX TOP SECTION – A sufficient area shall be excavated to enable the upper section of the water valve box to be removed. No debris shall be allowed to fall into the existing water valve box. New top section shall be carefully set over the existing bottom section and adjusted to the proper elevation.

METHOD OF MEASUREMENT

The provisions of the NYSDOT Standard Specifications Section 663, and the contract documents shall apply with the following modifications:

The quantity to be measured for payment shall be the number of water valve boxes actually installed or removed.

BASIS OF PAYMENT

The provisions of the NYSDOT Standard Specifications Section 663, latest revision, and the contract documents shall apply with the following modifications:

GENERAL – The unit price bid for all items shall include the cost of: furnishing and installing new water valve box assemblies; having existing water valves checked; removal and disposal of existing water valve boxes; pavement saw cutting; and furnishing all labor, material and equipment necessary to complete the work.

REMOVE EXISTING WATER VALVE BOX – Separate payment for removal of water valve box shall not be made if the water valve box is replaced or if water valve box is located inside the pavement reconstruction or trench and culvert excavation area, or if removal of the water valve box is being done in conjunction with removal of an existing valve or removal of an existing hydrant. Cost of removal and disposal of those water valve boxes shall be included in those items bid.

REPLACEMENT OF WATER VALVE BOX TOP SECTION – The unit price bid shall also include the cost of: removal of existing water valve top sections and lids; furnishing and installing new water valve box top sections and lids.

EXCAVATION, BACKFILL AND SURFACE RESTORATION – Excavation, furnishing and placing of select granular backfill and surface restoration will be paid for under separate bid items.

ITEM 663.51000004 – FURNISH AND INSTALL NEW WATER VALVE BOX
ITEM 663.52000004 – REMOVE EXISTING WATER VALVE BOX
ITEM 663.53000004 – REPLACE EXISTING WATER VALVE BOX TOP SECTION

Payment will be made under:

Item No.	Item	Pay Unit
663.51000004	Furnish and Install New Water Valve Box	Each
663.52000004	Remove Existing Water Valve Box	Each
663.53000004	Replace Existing Water Valve Box Top Section	Each

ITEM 664.01040004 - DUCTILE IRON SEWER PIPE & FITTINGS, 4"
ITEM 664.01060004 - DUCTILE IRON SEWER PIPE & FITTINGS, 6"
ITEM 664.01080004 - DUCTILE IRON SEWER PIPE & FITTINGS, 8"
ITEM 664.01100004 - DUCTILE IRON SEWER PIPE & FITTINGS, 10"
ITEM 664.01120004 - DUCTILE IRON SEWER PIPE & FITTINGS, 12"
ITEM 664.01140004 - DUCTILE IRON SEWER PIPE & FITTINGS, 14"
ITEM 664.01160004 - DUCTILE IRON SEWER PIPE & FITTINGS, 16"
ITEM 664.01180004 - DUCTILE IRON SEWER PIPE & FITTINGS, 18"
ITEM 664.01200004 - DUCTILE IRON SEWER PIPE & FITTINGS, 20"
ITEM 664.01240004 - DUCTILE IRON SEWER PIPE & FITTINGS, 24"
ITEM 664.01300004 - DUCTILE IRON SEWER PIPE & FITTINGS, 30"
ITEM 664.01360004 - DUCTILE IRON SEWER PIPE & FITTINGS, 36"
ITEM 664.01420004 - DUCTILE IRON SEWER PIPE & FITTINGS, 42"

DESCRIPTION: Under this item, the Contractor shall furnish and install cement lined, ductile iron sewer pipe and fittings and make all necessary connections to new and existing mains in accordance with the specification, as shown on the plans or as directed by the Engineer.

MATERIALS: As specified in the contract documents.

CONSTRUCTION DETAILS: As specified in the contract documents.

METHOD OF MEASUREMENT: The quantity will be measured as the number of feet of new sewer pipe (including all necessary connections and fittings) furnished and installed in accordance with the plans, specifications and as directed by the Engineer.

BASIS OF PAYMENT: The unit price bid shall include the cost of furnishing all labor, materials and equipment necessary to complete the work including, but not limited to fittings, plugs, connections, and leakage tests.

Excavation, backfill, sheeting and specials will be paid for under their respective items.

Progress payments will be made at the unit price bid for 80 percent of the quantity of pipe installed. The remaining 20 percent will be paid for when the testing of the system has been completed.

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ITEM 664.40XX0006 - PRECAST SANITARY SEWER MANHOLE

DESCRIPTION

This specification covers the requirements for furnishing and installing precast sanitary sewer manholes as shown on the plans and in accordance with these specifications. The work shall conform to the requirements of NYSDOT Section 604 – Drainage Structures with the following modifications:

MATERIALS

Under Section 604-2.01 Drainage Structure and Manholes, **ADD** the following:

"Exterior coating for manhole shall be either Mobil Mo-Tar 4, Rust-Oleum 9300 Epoxy System or approved equal.

Precast reinforced concrete top slab and/or precast landing if required shall be manufactured in accordance with the detail shown on the contract plans. The concrete used in the manufacturing of these slabs shall be minimum 4000 psi concrete as specified under Section 706-04, "Precast Concrete Drainage Units" of the NYSDOT Standard Specifications."

Pipe Connections into the Sanitary Sewer Manholes shall be as follows

a. The precast reinforced concrete manhole base shall be provided with circular openings at the locations and elevations for the proper connection of pipes. The pipe connections shall be sealed with flexible manhole seal assemblies.

b. The flexible manhole seal assemblies shall be installed in accordance with the recommendations of the seal assembly manufacturer and shall conform to ASTM C923.

c. Flexible manhole seal assemblies shall permit at least an eight (8) degree deflection from the centerline of the opening in any direction while maintaining a watertight connection.

d. The flexible manhole seal assemblies shall be as manufactured by Interpace Corp. (Lock Joint Flexible Manhole sleeve), National Pollution Control Systems, Inc. (Kor-N-Seal) or Press-Seal Gasket Corp. or approved equal.

A cast-in-place concrete invert shall be formed within the precast concrete manhole base as shown on the contract drawings with Class A concrete.

CONSTRUCTION DETAILS

At the end of Section 604-3.02 Concrete Drainage Structure and Manholes, **ADD** the following:

Manhole Bases

For precast manhole bases, the area underneath the manhole base shall be excavated to the required elevation. The soil below the base shall not be disturbed. The manhole base shall then be lowered into the trench and checked for proper bearing on the subgrade, proper elevation and orientation to receive the incoming and outgoing sewers at the designated invert elevation. If the invert elevation varies by more than plus or minus ½ inch from the designated invert elevation, the base shall be removed and reset.

ITEM 664.40XX0006 - PRECAST SANITARY SEWER MANHOLE

Cast In Place Inverts

The concrete invert fill shall be installed following the connection of all sewer pipes to the manhole. The invert fill shall be true to the sewer pipe invert elevations, with smooth channels of uniform cross section and slope, either straight or with a continuous curve between inlet and outlet of pipes. The concrete invert fill shall be placed in accordance with dimensions and details shown on the Contract Plans.

To eliminate free fall conditions in a manhole resulting from invert elevation differentials between incoming and outgoing pipes, the Contractor shall form and construct suitable channels in the bottom of the manhole connecting the inverts.

The complete exterior, flow channel, and bench shall receive a prime and finish coat of the specified coating. Application shall be in strict conformance with the manufacturer's recommendations.

Masonry Collar

The precast concrete pavers or precast concrete collar be constructed on the Precast Concrete Top Slab to bring the manhole frame and cover to the proper grade in accordance with the detail on the Contract Plans. The minimum height shall be 4 inches and the maximum height shall not exceed 16 inches.

Following the placement of the pavers, a ½ inch layer of Masonry mortar shall be applied to the exterior surface of the brick and trowelled to a smooth finish.

Leakage Tests

For leakage test purposes, a section of sewer line shall be construed as being that portion of a sewer line between two (2) consecutive manholes inclusive of upstream manhole and appurtenances unless otherwise specified.

The Contractor shall be required to notify the Engineer not less than forty-eight (48) hours prior to the time he intends to begin testing at any particular location.

Prior to undertaking any repairs, the Engineer's written approval of method and material to be used in the repair shall be secured. Items which in the opinion of the Engineer cannot be repaired shall be replaced.

a. All gravity and pressure sewer lines, including but not limited to pipe, fittings, manholes, risers, stubs, specials an appurtenances shall be tested for water tightness as hereinafter specified.

b. The Contractor shall furnish all necessary material, equipment, labor and other facilities required to satisfactorily perform the tests and shall make all necessary repairs or replacements and retests as required at his own expense.

c. The Contractor is warned that the Engineer may refuse to allow exfiltration testing, or void those already underway if, in his judgment, heavy rain or rainwater inflow will distort test results. Retests of the affected lines shall be done at no cost to the County, State or other agency having jurisdiction. No claims for delays will be considered by the County, State or other agency having jurisdiction, in the event testing is suspended by the Engineer, as specified above.

d. All sewer pipes and manholes must be clean prior to any work described in this section. They shall be free from dirt, debris, sand, stones, etc. and accumulated water must be removed.

e. The testing of new manholes will be performed using the water exfiltration test or air test. Air pressure testing on manholes shall be done in accordance with ASTM C1244. This specification describes the testing process for an exfiltration test.

f. Prior to the exfiltration test, all pipes in the new manhole to be tested shall be plugged. All plugs shall be installed in the presence of the Engineer or his representative. Each new manhole shall be filled with water to a level not less than 4 feet above the exterior crown of the upstream pipe or above the normal groundwater level whichever is higher.

g. A twenty four (24) hour stabilization period will be required prior to taking measurements. Should the water level during the stabilization period drop below the test level as specified above, the Contractor, in the presence of the Engineer or his representative shall add make-up water for water lost during the stabilization period to increase the water level to the required height for the test.

h. The actual test period shall begin following the stabilization period. Addition of make-up water will not be allowed once the test has begun. *Any deviation* from the aforementioned will *void* the test.

i. The test shall be conducted for a period of at least two (2) hours. The Engineer or his representative will take three (3) readings of the water level at the beginning of the test period, and another three (3) readings of the water level at the end of the test period. The average of the readings will be used by the Engineer to calculate the leakage quantity.

j. The maximum allowable quantity of exfiltration from any manhole under test shall not exceed 0.25 gallons per foot diameter of manhole per foot of water depth measured from the invert of the downstream pipe per twenty-four (24) hours.

Prior to making any repairs, the Contractor shall submit to the Engineer, in writing, the proposed method of repair and secure his written approval of methods and material to be incorporated in the repair. The Engineer shall be the sole judge as to whether the pipes or manholes shall be repaired or replaced.

All repairs and retesting must be made in the presence of a representative of the Engineer and to the satisfaction of the Engineer.

Should a section or sections of pipe, or manholes fail to meet the leakage criteria, the Contractor shall at no cost to the County, State, or other agency having jurisdiction, locate the leaks and repair pipe and manholes, as necessary, until the leakage is within the permitted allowance.

Regardless of the results of the infiltration test, it is required that all visible leaks be repaired.

The injection of gel, sealant, or any other product to seal cracks, porous section, or any other structural defect of the pipe or manhole will not be permitted.

All tests and repairs shall be repeated as many times as necessary, at no cost to the County,

ITEM 664.40XX0006 - PRECAST SANITARY SEWER MANHOLE

State or other agency having jurisdiction, until the requirements hereinbefore specified have been met.

METHOD OF MEASUREMENT

The quantity to be measured under this item will be the number of linear feet of height, measured to the nearest ¼ foot, from the bottom of the manhole base to the top of the masonry collar.

BASIS OF PAYMENT

The unit price bid per linear foot shall include the cost of all labor, equipment, and materials necessary to complete the work including flexible gaskets between manhole sections, concrete invert fill, precast top slab and landings, and all necessary testing and any repairs to the manhole required in connection with the sewerage tests on the manhole.

Manhole frames and covers will be paid for under separate items.

Excavation (dewatering included in Excavation), backfill, select fill, geotextile and any necessary sheeting will be paid for under separate items.

Payment will be made under:

Item No.	Description	Pay Unit
664.40480006	Precast Sanitary Sewer Manhole (48 inch DIA.)	Linear Foot
664.40600006	Precast Sanitary Sewer Manhole (60 inch DIA.)	Linear Foot
664.40720006	Precast Sanitary Sewer Manhole (72 inch DIA.)	Linear Foot
664.40840006	Precast Sanitary Sewer Manhole (84 inch DIA.)	Linear Foot
664.40960006	Precast Sanitary Sewer Manhole (96 inch DIA.)	Linear Foot

ITEM 680.01040015 – TRAFFIC SIGNAL SYSTEMS

DESCRIPTION:

The work shall consist of establishing Traffic Signal Systems in accordance with all applicable Standard Sheets and Specifications and in accordance with the Contract Documents. All work involving vehicular Traffic Signal Systems, and components, satisfactorily removed / relocated and or supplied / installed is included. The work shall include, but not be limited to, demolition, saw cutting, excavation, disposal, fill, topsoil, establishing turf (to disturbed areas), Landscaping (adjustments and grading of existing ground), repairs to affected asphalt and concrete as necessary, Traffic Signal Systems, and components (removed and or supplied / installed), Traffic Signal Systems wiring, including vehicle detection (removed and or supplied / installed), furnishing electrical service, finish work, and any required adjustments to utilities. All material and labor required to perform these tasks is included.

MATERIAL:

The material shall comply with the New York State Department of Transportation, Standard Specifications dated May 1, 2008 and its latest update effective as of the letting date. The specifications and updates may be accessed at (https://www.dot.ny.gov/main/business-center/engineering/specifications). The material shall comply with, but not be limited to, the requirements of the following sections: 680-2.

CONSTRUCTION DETAILS:

The work shall be in accordance with, but is not limited to, the following section: 680-3.

The contractor shall be in compliance with New York State Code, Rule 753. The contractor shall coordinate with utility companies and any appropriate governmental agency when utilities and/or access to these facilities are affected by the contractor's work. This may include, but is not limited by, utility poles, pull boxes, shut off boxes, manhole access covers, and underground equipment. Any existing facilities not indicated to be removed that are damaged by the contractor's operations, shall be repaired by the contractor, to the satisfaction of the Engineer, at no additional cost.

METHOD OF MEASUREMENT:

The quantity to be paid shall be the lump sum unit price bid for Traffic Signal Systems, satisfactorily completed, in accordance with the Contract Documents.

BASIS OF PAYMENT:

The inclusive unit price bid shall include the cost of all labor, material and equipment necessary to satisfactorily complete the work, including the cost of establishing power (Furnishing Electrical Service), to the acceptance of the Engineer. Any required Survey, shall be paid for separately under the lump sum price bid for survey operations.

ITEM 680.10000007 - INSTALL TRAFFIC SIGNAL POLE, ALL SIZES

DESCRIPTION:

Under this item the Contractor shall install Traffic Signal Poles of the types and at the locations shown in the contract documents and/or requested by the New York State Department of Transportation. Construction of any foundations is not part of this work.

MATERIALS:

Traffic Signal Poles will be furnished by others.

CONSTRUCTION DETAILS:

The poles shall be installed in accordance with section 680-3 of the Standard Specifications. Drilling of any poles necessary to accept spanwise(s) shall be part of this work.

METHOD OF MEASUREMENT:

Work will be measured by the number of Traffic Signal Poles installed.

BASIS OF PAYMENT:

The unit price bid shall include the cost of all labor, equipment, and materials necessary to satisfactorily complete the work. Any anchor bolt installation is to be included in the cost of foundation work.

ITEM 680.79300010 - REMOVE TRAFFIC SIGNAL HEAD OR PEDESTRIAN SIGNAL HEAD

Description:
Under this item the Contractor shall remove and store the traffic signal heads and pedestrian signal heads and mounting assembly from a span wire, mast arm, post or pole as ordered by the Engineer.

Material:
None required.

Construction Details:

1) Span Wire Mounted Traffic Signal Heads.

   The signal head and hanger shall be removed from the span wire. Care shall be taken so as not to damage the signal cable connected to the head. This signal cable shall be reused or terminated in accordance with the specifications, plans, and as ordered by the Engineer.

2) Post or Pole Mounted Traffic Signal Heads or Pedestrian Signal Heads.

   The signal head and mounting assembly shall be removed from the mast arm, pole or post. Care shall be taken not to damage the signal cable connected to the head. This signal cable shall be reused or removed from the pole or post in accordance with the specifications, plans, and as ordered by the Engineer.

   The holes left in the traffic signal pole after the removal of the signal head and mounting assembly shall be sealed in accordance with the specifications, plans, and as ordered by the Engineer.

Care shall be taken that the removed signal head is not damaged. The head is to be stored on the contract site for pick up by the State forces. All other materials removed will become the property of the Contractor and shall be removed from the site.

Method of Measurement:

This work will be measured as the number of traffic signal heads or pedestrian signal heads removed.

Basis of Payment:

The unit price bid for each signal head removed shall cover the cost of all labor, material and equipment necessary to complete the work.

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ITEM 680.82250301 - REMOVE STEEL EMBEDDED TRAFFIC SIGNAL POLE

DESCRIPTION:

Under this item, the Contractor shall remove steel embedded traffic signal poles.

MATERIALS:

Concrete shall meet the requirements of Section 680-2.02, and shall be Class A.

CONSTRUCTION DETAILS:

The Contractor shall remove and dispose of the steel embedded traffic signal pole from the locations indicated in the plans, or when ordered by the Engineer. The Contractor shall chip away the pole foundation to a point 18" below the finished grade and shall cut the pole off at that point. The Contractor shall backfill the base of the pole remaining in the ground with Class A concrete, backfill the remaining portion of the excavation in accordance with section 680-3.09, Excavation, and shall restore the surface area to match the existing surrounding conditions.

METHOD OF MEASUREMENT:

This work will be measured as the number of steel embedded traffic signal poles removed.

BASIS OF PAYMENT:

The unit price bid for each steel embedded traffic signal pole removed shall cover the cost of disposal, and all labor, excavation, suitable backfill, Class A concrete, material, and equipment necessary including surface restoration.

683.090700WE MOVABLE BRIDGE STANDBY GENERATOR

DESCRIPTION

This Section includes packaged diesel engine-generator sets rated for 150KW, 188kVA, 0.8 power factor, 277/480 volts, wye connected, three phase, 4 wire, 60 hertz. The generator's rating shall be based manufacturer's previously published stand-by rating as defined by ISO 8528.

Provide stand-by rated power supply with the following features:

Diesel engine.
High ambient cooling system.
Unit-mounted control and monitoring.
Unit mounted utility grade protection.
Performance requirements for sensitive loads.
Permanent Load bank.
Sound (level II)attenuated generator enclosure.
Double wall secondary containment sub-base fuel tank.
Connection box for Portable generators.

Related Sections include the following:

599.063000WE Movable Bridge Electrical and Control System.

599.064000WE Movable Bridge Testing.

DEFINITIONS

Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

Standby Rating: In accordance with ISO 8528. Power output rating equal to the power the generator set delivers continuously under normally varying load factors for the duration of a power outage. The manufacturer as part of this specification shall define a minimum operating duration without maintenance without affecting the expected life of the generator or warranty.

Operational Bandwidth: The total variation from the lowest to the highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

Power Output Rating: Gross electrical power output of diesel engine generator set minus total power requirements of cooling fans, pumps and other accessories.

Steady-State Voltage Modulation: The uniform cyclical variation of voltage within the operational bandwidth, expressed in hertz.

SUBMITTALS

Product Data: For each type of packaged engine generator indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. In addition, include the following:

Thermal damage curve for generator.
Time-current characteristic curves for generator protective device.

Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
Wiring Diagrams: Power, signal, and control wiring.

Manufacturer: Submit detail shop drawing for each engine-generator set, detailing batteries, battery racks, enclosure, panel, heater, etc.

Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
Detailed description of equipment anchorage locations and *vibration isolators.*
Provide octave-band sound levels in addition to the overall or 'dba' rating.
Prototype test documents for generators indicating conformance to the specifications.

Source quality-control test reports.

Certified summary of Factory unit test report.
Certified Summary of Performance Tests: Certify compliance with specified requirement to meet generator set performance criteria.
Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
Report of sound generation shall include dbA measurements at a distance of 23 feet from perimeter surfaces of the enclosure.
Report of exhaust emissions showing compliance with applicable regulations.
Certified Torsional Vibration Compatibility: Comply with NFPA 110.
Field quality-control test reports.
Load bank & generator batteries must be tested with the generator at the enclosure factory test.

Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals, two CD copies of all manuals, test reports submittal information as well as those items listed below. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.

Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Fuses: One for every 10 of each type and rating, but no fewer than one of each.
Indicator Lamps: Two for every six of each type used, but no fewer than two of each.
Filters: One set each of lubricating oil, fuel, and combustion-air filters.

QUALITY ASSURANCE

Technician Qualifications: The manufacturer's authorized representatives who are factory trained and qualified to perform start-up, commissioning and maintenance of the equipment shall be utilized at all times. Local technicians employed by independent distributors shall be allowed as long as there is at least one representative directly employed by the generator manufacturer on site at all times during the start-up, testing and commissioning process.

The equipment must be supplied by the engine manufacturer's local authorized distribution office having the authority to perform start-up and warranty repair in the geographical area of the project site. Proposals for equipment supplied by 3rd party dealers or distributors outside of the geographical area of the project site will not be allowed. Vendors of equipment who rely on 3rd parties to perform any warranty repair do not meet the intent of this specification.

Maintenance Proximity: The distributor must maintain a fully stocked and staffed office, parts and maintenance facility within 30 miles of the project site to assure not more than two hours' normal travel time from distributor's place of business to the project site.

Manufacturer's Responsibility: Preparation of data for vibration isolators and seismic restraints of engine skid mounts, housing including Shop Drawings, as specified in section 2.9 and based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

Manufacturer's Qualifications: Maintain, within 30 miles of project site, a manufacturer direct service center capable of providing training, parts, and emergency maintenance repairs. To be considered a manufacturer, the generator manufacturer must be the manufacturer of the engine, alternator and major components of the generator set. Manufacturers who purchase engines from the original engine manufacturer for use as a vendor component are considered "assemblers" and do not meet the minimum requirements of this specification.

Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with ASME B15.1.

Comply with NFPA 37.

Comply with NFPA 70.

Comply with NFPA 99.

Comply with NFPA 110 requirements for level 1 emergency power supply system.

Comply with UL 1446 & 2200.

Engine Exhaust Emissions: Comply with applicable state and local government requirements for the latest EPA Tiered emissions requirements.

Noise Emission: The sound level shall be 72 dbA or less at 23 feet from perimeter surfaces.

683.090700WE MOVABLE BRIDGE STANDBY GENERATOR

PROJECT CONDITIONS

Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

Notify Construction Manager no fewer than Five (5) days in advance of proposed interruption of electrical service.
Do not proceed with interruption of electrical service without Owner's written permission.

Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:

Ambient Temperature: 5 to 50 deg C
Relative Humidity: 0 to 95 percent.
Altitude: Sea level to 1000 feet

DELIVERY, STORAGE AND HANDLING

The equipment shall be shipped FOB project jobsite via direct dedicated carrier on an air ride truck to job site.

Deliver diesel engine generators and system components to their final locations in protective wrappings, containers, and other protection that will exclude dirt and moisture and prevent damage from construction operations. Remove protection only after equipment is safe from such hazards.

The Supplier shall prepare and crate all equipment covered by this specification in such a manner as to protect it against damage in transit. The Supplier shall incur all responsibility and expense for repair of damage due to improper preparation, crating, or damage while in transport. Each shipping unit shall be braced adequately and rigidly both internally and externally to prevent damage during transit or in the process of erection.

All equipment shall have provisions for lifting and skidding. All lifting points shall be clearly marked.

COORDINATION

Specify the size and location of concrete bases for packaged engine generators. Supply a plan detailing the location of the anchor bolts and inserts.

Compatibility with Existing Equipment:

Work under this item requires connection of new/rehabilitated items to existing components to remain. The Contractor shall perform field visits and verifications necessary to ensure that the materials and methods being proposed will be completely compatible with the existing equipment to remain, and that all original system functions will be returned to operation at the completion of the Contract work.

It is noted that, in certain cases, it may not be possible to locate new components which fully integrate and provide compatible operation with existing equipment/components to remain. In this case, the

Contractor may propose alternate methods including replacement/alteration of existing system components that are not shown to be replaced or modified in the Contract Documents. The Contractor shall make a submittal to the Engineer, who shall have the sole discretion regarding approval of the alternate methods. Where approved by the Engineer, the alternate methods shall be considered to be for the Contractor's benefit, and the Contractor shall not receive additional payment for the changes in work performed. Any costs associated with ensuring integration of the proposed work/equipment to existing systems, such that the existing systems are restored to original functionality, shall be borne by the Contractor and included in the bid price of this item.

WARRANTY

Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

Warranty Period 2 years commencing from the date of start-up or 18 months from shipment (whichever occurs first).

Extended warranties shall be made available to the owner for consideration and purchase up to the expiration date of the original warranty.

MAINTENANCE SERVICE

Initial Maintenance Service: Beginning at substantial completion, provide 1st year full maintenance by skilled employees of manufacturer's direct service organization. The 1st year maintenance shall include one (1) major maintenance visit including oil change and fluid samples. In addition to the major maintenance visit, include quarterly visits to determine the overall condition of the generators and perform exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment. All maintenance during the warranty period shall be performed by direct employees of the engine/generator manufacturer.

PRODUCTS

MANUFACTURERS

Acceptable Manufacturers: The project has been based on the features, dimensions and performance characteristics of equipment manufactured by Cummins Power Generation. Classifying a manufacturer as "Acceptable" only denotes a general acceptance of the manufacturing brand and does not guarantee acceptance of a specific product or model. Subject to compliance with the project requirements, the following manufacturers equipment will be reviewed:

Cummins Power Generation (basis of design).
MTU.
Caterpillar.

683.090700WE MOVABLE BRIDGE STANDBY GENERATOR

ENGINE-GENERATOR SET

Factory-assembled and tested, engine-generator set.

Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.

Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity.

Capacities and Characteristics:

Power Output Rating: The equipment rating will be based on the generator's ability to provide sufficient power during sustained utility power failures. The generator's nameplate shall bear the manufacturer's stand-by rating. The rating used for this project must be based on ratings routinely published by the manufacturer for the proposed equipment. Special one-time ratings or letters offering higher than commonly published ratings for this specific project (as opposed to commonly available literature) will not be accepted and may result in rejection of the complete bid package. Each generator set shall be rated for a minimum of 150KW, 480/277 volts, 3-phase, 4-wire, 0.8 power factor, at 1000 feet altitude and shall be capable of operating at the stand-by rating for the duration of the power outage. The total allowable instantaneous voltage dip will be a maximum of 20%. The maximum instantaneous frequency dip will be 10%.

Output Connections: Three-phase, four wire, NEMA two bolt lugs or breakers as per the project drawings.

Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of components.

Generator-Set Performance:

Oversizing generator compared with the rated power output of the engine is permissible to meet specified performance.

Nameplate Data for Oversized Generator: Show ratings required by the Contract Documents rather than ratings that would normally be applied to generator size installed.

Steady-State Voltage Operational Bandwidth: .5 percent of rated output voltage from no load to full load.

Transient Voltage Performance: Not more than 30 percent variation for 100 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 4 seconds.

Steady-State Frequency Operational Bandwidth: Plus or minus 0.25 percent of rated frequency from no load to full load.

Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.

Transient Frequency Performance: Less than 20% variation for 100 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within 5 seconds.

Output Waveform: At no load, harmonic content measured line to neutral shall not exceed 2 percent total with no slot ripple. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.

Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to winding insulation or other generator system components.

Excitation System: Performance shall be unaffected by voltage distortion caused by nonlinear load.

Provide permanent magnet excitation for power source to voltage regulator.

Start Time: The emergency power system including automatic transfer switches is intended to comply with NFPA 110, Type 10, system requirements.

ENGINE

Fuel: Ultra-Low Sulfur Diesel Fuel.

Rated Engine Speed: 1800 rpm.

Lubrication System: The following items are mounted on engine or skid:

Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.

Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.

Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

Engine Fuel System:

Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.

Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.

Provide primary fuel filters located ahead of the engine fuel pump to filter fuel prior to introduction to the engine fuel system.

Filters shall be heavy duty, high capacity fuel pre-filter/water separators (25 microns) as manufactured by Fleetguard. Each filter set shall be equipped with water in fuel sensors wired to the local generator controller to initiate an alarm if water is present. Provide replaceable secondary fuel oil filters.

Coolant Jacket Heater: Electric-immersion type heater, factory installed in coolant jacket system sized to comply with NFPA 110 requirements for Level 1 equipment for heater capacity. Provide hand-operated isolation ball valves to facilitate service or jacket heater replacement without draining cooling system.

Governor Adjustable isochronous, with speed sensing.

Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.

Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.

Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.

Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.

Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.

Coolant Hose: Coolant hoses shall be stainless steel braided not hydraulic hoses.

Minimum Rating: 50-psig (345-kPa) maximum working pressure with coolant at 180 deg F (82 deg C), and noncollapsible under vacuum.

End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

Muffler/Silencer: Critical grade type (or as required to meet the acoustical requirements of the project specified elsewhere), sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements. Minimum sound attenuation of 25 dba at 500 Hz. Sound level measured at a distance of 23 feet from exhaust discharge after installation is complete shall be 72 dba or less or as required to meet the acoustical requirements of outdoor enclosures if specified.

Crankcase Ventilation device: An air box crankcase ventilation vapor recovery system shall be provided. A drain valve shall be provided to expel residue. Provide gauges to measure pressure in assemblies.

Air-Intake Filter Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

Starting System: 24-V electric, with negative ground.

Components: Provide a minimum of 1 full sized engine starter. The starter shall be sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.

For engines with multiple starting motors, starters shall be independently wired to the starting batteries such that failure of cables or connections on one motor does not impact any other motor.

Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.

Cranking Cycle: Minimum of three (3) cranking cycle duration of 15 seconds each.

Batteries: Provide lead acid starting batteries. Each set shall have adequate capacity to start the engine within ambient temperature range specified in Part 1 "Project Conditions" Article and provide specified cranking cycle at least six (6) times without recharging.

Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.

Battery Racks: Factory fabricated with acid-resistant finish. Include accessories required to support and fasten batteries in place.

Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation rated for continuous operation.

Battery Chargers: For each battery string, provide a current-limiting, automatic-equalizing and float-charging type charger Unit shall comply with UL 1236 and include the following features:

Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then

be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.

Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.

Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.

Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.

Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.

Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.

CONTROL AND MONITORING

Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration. When required to be operated in a current or future parallel configuration, the controller shall be specifically designed to facilitate automatic synchronizing and paralleling of generator-to-utility or generator-to-generator to a common bus. The operator panel shall include:

Off/manual/auto mode control switch - The not in auto lamp will flash when the control is in the manual or off mode. In the auto mode, the generator set can be started using the exercise push-button or with a start signal from a remote device, such as automatic transfer switches or electrical distribution PLC based control system.

Exercise control switch and indicating LED - When the mode control switch is in the auto position the exercise control switch is used to complete a pre-programmed exercise sequence. All exercise functions are disabled when an emergency start command is received by the control. An LED lamp adjacent to the switch will light to indicate the generator set is in exercise mode.

Fault acknowledge/reset switch - The control includes a fault acknowledge function to allow the operator to reset the fault condition. If the fault condition is not corrected, the fault will reappear, but will not be logged as a separate event. Multiple faults can be logged and displayed at one time.

Emergency Stop control switch.

Provisions for set up and adjustment functions via raise/lower switches on the operator panel. Functions that can be adjusted by the operator include:

Time delay start (0-300 seconds)

Time delay stop (0-600 seconds)

Alternator voltage (+5%)

Alternator frequency (+3 Hz)

The operator panel can be configured to require an access code prior to adjusting these values. A second access code is used to protect the control from unauthorized service level adjustments. Voltage and frequency adjustments are disabled during operation in parallel with a system bus to prevent inadvertent misadjustment of the paralleling load sharing functions.

Analog AC metering panel that simultaneously displays 3-phase line-to-line AC volts and current, kW, power factor and frequency. The meter panel is composed of a series of LEDs configured in bar graphs for each function. The LEDs are color coded with green indicating normal range values, amber for warning levels and red for shutdown conditions. Scales for each function are in % of nominal rated values.

Graphical display capable of displaying up to 9 lines of data with approximately 27 characters per line. The graphical display is accompanied by a set of six tactile-feel membrane switches that are used by the operator to navigate through control menus and to make control adjustments. Display is configurable for multiple languages. It is configurable for units of measurement. The display incorporates three levels of operation and adjustability. All data on the control can be viewed by scrolling through screens with the navigation keys. The top three lines of the display are allocated to mode and status messages that continuously display the operating mode of the control system, as well as any faults or warning conditions that may be present on the controller. If more than one fault or warning message is present, the messages will scroll to allow the operator to view all active messages in the system.

Generator set data including:

Generator set rating in kVA, complete generator set model number and serial number, engine model and serial number and alternator model and serial number. The control also displays the part number of the control and the software version present in the control.

Number of start attempts and number of start attempts since reset. Number of times generator set has run and number of times since reset. Duration of generator set running time and duration of running time since last reset. Generator set kWh produced and kWh produced since last reset.

Record of adjustment and setting changes made on the control, identifies whether adjustment was made via the operator panel or with a service tool. If a service tool is used, the control provides a record of the serial number of the tool used.

Record of the most recent fault conditions with time stamp, along with the number of times each fault has occurred. At least 20 events are stored in the control memory.

Data indicating the total operating hours at percent of load in 10% increments and since reset.

Generator set AC data including:

Generator set output frequency, voltage and current - All phases (line-to-line and line-to-neutral for voltage. Accuracy 1%.

Generator set power output - displays generator set kW and kVA output (average phase, individual phase and direction of flow) and power factor with leading/lagging indication. Accuracy 5%.

Generator set kWh energy output - Total kWh produced and total produced since last reset with time stamp of time of last reset.

Digital synchroscope - Bus voltage and frequency, generator set bus voltage and frequency, the phase angle displacement and a signal indicating "ready to close". A breaker control switch is included on this panel for convenient operation of the equipment without switching between viewing screens.

Engine data including:

Engine starting battery voltage, engine lube oil pressure and engine coolant temperature.

Engine coolant pressure, engine fuel rail temperature and pressure, engine fuel input and output temperature, intake manifold temperature and pressure, ambient air pressure, crankcase blowby flow and aftercooler inlet coolant temperature.

The fuel consumed by the engine calculated by the control based on fuel flow into the engine and returned by the engine, and the temperature of the two flow streams. Data provided includes overall average fuel consumed and consumption since reset.

Power transfer and control data:

Utility (mains) source data - Displays line-to-line and line-to-neutral voltage of utility (mains) source, frequency and estimated amps, and kW and kVA supplied by utility (mains) source.

System status information - Provides graphical system status display showing availability of sources and positions of each contactor or associated generator main breaker.

System control - Allows operator to view status of system and manually control operation of the system. Provides manual adjustment capability for time delay start, stop, transfer and retransfer, as well as time delays for program transition (when used) and power transfer overlap time.

General functions include:

System control voltage - The control operates on 24 VDC from the generator set starting batteries. Control functions are fully operational over a voltage range of 8 VDC to 36 VDC.

Emergency start mode - Accepts a ground signal from remote devices or a network signal to automatically start the generator set and immediately accelerate to rated speed and voltage.

Smart starting system that is designed to quickly start the engine, minimize black smoke, minimize voltage and frequency overshoot, and oscillations on starting by careful simultaneous control of the engine fuel system and alternator excitation system.

Non-emergency start mode - The control is provided with a separate remote start input or a network signal to start the generator set via the programmable idle control. Using the non-emergency mode, the generator set takes longer to start, but there is less wear on the engine. In this start mode, the gen-

erator set will start, operate at idle speed for a predefined time period or until the engine reaches operating temperature (whichever time is shorter), and then ramp to rated speed and voltage. Time delay is adjustable from 0-300 seconds and default is 10 seconds. The control also monitors and records the source of start signals, when that information is available. The control automatically exits idle mode if an emergency remote start signal is received at the control.

Data logging - The control maintains a record of manual control operations, warning and shutdown conditions and other events. It uses the control "on" time as the time- stamp means when a real time clock is not included with the control. The control also stores critical engine and alternator data before and after a fault occurs.

Fault simulation mode - Will accept commands to allow a technician to verify the proper operation of critical protective functions of the control by simulating failure modes or by forcing the control to operate outside of its normal operating ranges. Also provides a complete list of faults and settings for the protective functions of the specific generator set it is communicating with.

Built in test - The control system automatically tests itself, and all the sensors, actuators and harnesses in the control system, on a startup signal. The test can also be initiated either locally or remotely.

Engine control including:

Engine starting - The control operates a factory- supplied fuel valve that enables engine starting.

Cycle cranking - Configurable for number of starting cycles (1 to 7) and duration of crank and rest periods. Control includes starter protection algorithms to prevent the operator from specifying a starting sequence that might be damaging. Default setting is for (3) start cycles composed of 15 seconds of cranking and 15 seconds of rest.

Programmable idle speed control - In this mode the generator set would start and run to idle speed. It would operate at that speed for a programmed time period, then ramp to rated speed. When the control gets a signal to stop, it will ramp to idle, operate for the programmed period at idle and then shut down. During idle mode, engine protective functions are adjusted for the lower engine speed and alternator function is disabled.

Time delay start and stop (cool down) - Configurable for time delay of 0-300 seconds prior to starting after receiving a remote start signal in normal operation modes and for time delay of 0-600 seconds prior to ramp-to-idle or shutdown after signal to stop in normal operation modes. The generator set control will monitor the load during operation of the generator set, and if the total load on the set is less than 10% of rated it will reduce the operation time for the time delay stop in order to prevent extended operation of the engine at very light load levels. Default for both time delay periods is 0 seconds.

Isochronous governing - Controls engine speed within + 0.25% for any steady state load from no load to full load. Frequency drift will not exceed + 0.5% for a 33 °C (60 °F) change in ambient temperature over an 8 hour period.

Droop governing - Control can be adjusted to droop from 0 to 10% from no load to full load.

Temperature dynamics - Modifies the engine fuel system control parameters as a function of engine temperature. Allows engine to be more responsive when warm and more stable when operating at lower temperature levels.

Idle mode - Engine governing can be regulated at an idle speed for a programmed period on start or stop of the engine. When the engine is operating at idle speed, the alternator excitation is automatically switched off.

Alternator control including:

Digital output voltage regulation - Regulate output voltage to within 0.5% for any loads between no load and full load. Voltage drift will not exceed + 0.5% for a 33 °C (60 °F) change in temperature in an 8 hour period. On engine starting, or sudden load acceptance, voltage is controlled to a maximum of 5% overshoot over nominal level.

Torque-matched V/Hz overload control - The voltage roll-off set point and rate of decay (i.e., the slope of the V/Hz curve) is adjustable in the control. This function is automatically disabled when the control is in a synchronizing mode.

Fault current regulation - Regulate the output current on any phase to a maximum of 3 times rated current under fault conditions for both single phase and three phase faults. In conjunction with a permanent magnet generator, it will provide 3 times rated current on all phases for motor starting and short circuit coordination purposes.

Protective functions including:

On a warning condition, the control will indicate a fault by lighting the warning LED on the control panel and displaying the fault name and code on the operator display panel. The nature of the fault and time of occurrence are logged in the control.

On a shutdown condition, the control will light the shutdown LED on the control panel, display the fault name and code, initiate shutdown and lock out the generator set. The shutdown sequence of the generator set includes programmable cool down at idle for fault conditions that do not endanger the engine. The control maintains a data log of all fault conditions as they occur and time stamps them with the controller run time and engine operating hour data.

The control system shall include a "fault bypass" mode that forces the system to function regardless of the status of protective functions. In this mode, the only protective functions that are operational are over speed, loss of both speed sensors, moving the control switch to the off position or pressing the emergency stop switch. The control maintains a record of the time that the mode is enabled and of all warning or shutdown conditions that have occurred while in the "fault bypass" mode.

System protective functions including:

Configurable alarm and status inputs - Accepts alarm or status inputs (contact closed to ground) to indicate customer- specified conditions. The control is programmable for warning, shutdown or status indication.

Emergency stop - Annunciated whenever the local or remote emergency stop signal is received. Alarm panel distinguishes between local or remote operation.

Over current warning - Output current on any phase at more than 110% of rating for more than 60 seconds.

Over current shutdown (51V) - Output current on any phase is more than 110%, less than 175% of rating and approaching thermal damage point of alternator. Control includes algorithms to protect alternator from repeated over current conditions over a short period of time.

High AC voltage shutdown (59) - Output voltage on any phase exceeds preset values. Time to trip is inversely proportional to amount above threshold.

Low AC voltage shutdown (27) - Voltage on any phase has dropped below a preset value.

Under frequency shutdown (81u) - Generator set output frequency cannot be maintained.

Over frequency shutdown/warning (81o) - Generator set is operating at a potentially damaging frequency level.

Engine protection functions including:

Over speed shutdown - Default setting is 115% of nominal.

Low lube oil pressure shutdown - Level is preset to match the capabilities of each engine. Control includes time delays to prevent nuisance shutdown signals.

Low lube oil pressure warning - Level is preset to match the capabilities of each engine. Control includes time delays to prevent nuisance shutdown signals.

High coolant temperature shutdown.

High coolant temperature warning.

Low coolant temperature warning - Indicates that engine temperature may not be high enough for a 10 second start or proper load pickup.

Low and high battery voltage warning - Indicates battery charging system failure by continuously monitoring battery voltage and indicating a problem when voltage is outside a preset acceptance band.

Weak battery warning - The control system will test the battery bank each time the generator set is signaled to start and indicate a warning if the generator set battery indicates impending failure.

Fail to start (overcrank) shutdown.

Fail to crank shutdown - Control has signaled starter to crank engine but engine does not rotate.

Low fuel day tank and low fuel main tank warning (when used).

Cranking lockout - The control will not allow the starter to attempt to engage or to crank the engine when the engine is rotating.

Sensor failure indication - All analog sensors are provided with sensor failure logic to indicate if the sensor or interconnecting wiring has failed. Separate indication is provided for fail high or low.

Certifications – The controller meet or exceed the requirements of the following codes and standards and shall bear the labeling as necessary:

NFPA110: For Level 1 systems.

UL508: Listed and suitable for use on UL 2200 Listed generator sets.

UL6200 Controls for Power Generation

CSA C282-M: 1999 compliance

CSA 22.2 No. 14 M91: Industrial Controls

ISO 8528-4: 1993 compliance, Controls and Switchgear

NFPA99: Standard for Health Care Facilities

CE Mark

IEC 801.2, 3, 4, 5

ISO9001, Control systems and generator sets are designed and manufactured in ISO9001 certified facilities.

Environmental capability:

The control is designed for proper operation without recalibration in ambient temperatures from -40 °C to +70°C (-40 °F to +158 °F) and for storage from -40 °C to +80°C (-40 °F to +176 °F). Control will operate with humidity up to 95%, non-condensing and at altitudes up to 5000 m (13,000 ft).

The operator control panel has a single membrane surface which is impervious to the effects of dust, moisture, oil and exhaust fumes. The panel uses sealed membrane or oil- tight switches to provide long reliable service life in harsh environments.

The control system is specifically designed for resistance to RFI/EMI and to resist the effects of vibration to provide a long reliable life when mounted on a generator set. The control includes transient voltage surge suppression to provide compliance to referenced standards.

The control is mounted on a vibration-isolated structure attached to the generator set skid and includes all generator set wiring factory-installed.

The control shall include Modbus RTU communications as standard via RS-485 half duplex or ModBus TCP/IP. The ModBus interface shall be available for communications to the BMS or EPMS

as directed. Include a minimum of 2 man-days per generator to facilitate the interface with the BMS system.

Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.

Connection to Data Link: A separate terminal block, factory wired to Form C dry contacts, for alarm and status indication is reserved for connections for data-link transmission of indications to remote data terminals.

Include provisions for monitoring the start signal integrity from emergency/life safety (NEC Article 700) automatic transfer switches in conformance with the 2017 (or newer) version of NFPA 70 (NEC).

Remote Alarm Annunciator - Comply with NFPA 99/110. Each generator will be supplied with a remote annunciator meeting the requirements of NFPA 110 and NFPA 99.

Remote Emergency-Stop Switch: For outdoor generators, the remote emergency stop switches shall be located either on the exterior of the generator enclosure or at the nearest building entrance adjacent to the generators.

GENERATOR OVERCURRENT AND FAULT PROTECTION

Refer to the project one-line for circuit breaker requirements. Circuit breakers shall be insulated case, electronic-trip type; 100 percent rated complying with UL 489 or as indicated on the project drawings.

Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
Trip Settings: Selected to coordinate with generator thermal damage curve.
Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
All breakers feeding emergency/life safety loads shall be supplied with auxiliary contacts to indicate position status when required by NFPA 70.
Mounting: Adjacent to or integrated with control and monitoring panel.
Output circuit breakers shall have a minimum short circuit rating of 42,000 AIC or as required per the short circuit study. Coordinate short circuit rating and set point of each breaker in the presence of a factory trained representative.
In addition to the main line breakers indicated, provide one (1) load bank breaker sized to coordinate with the permanent load bank.

Generator Protector: Microprocessor-based unit shall continuously monitor current level in each phase of generator output, integrate generator heating effect over time, and predict when thermal damage of alternator will occur. Protector shall perform the following functions:

Initiates a generator overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms.
Under single or three-phase fault conditions, regulates generator to 300 percent of rated full-load current for up to 10 seconds.

As overcurrent heating effect on the generator approaches the thermal damage point of the unit, protector switches the excitation system off.
Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.

Ground-Fault Indication: Comply with NFPA 70, "Emergency System" signals for ground-fault. Integrate ground-fault alarm indication with other generator-set alarm indications.

GENERATOR, EXCITER, AND VOLTAGE REGULATOR

The generator set shall be capable of supplying a minimum of 516 skVA (with a power factor low enough for engine to support the load) and recover to at least 90% of nominal voltage per the requirements of NEMA MG1-32 to support starting of motor and other surge loads, and shall recover to 100% of nominal. The generator set shall not shut down due to undervoltage or any other AC fault condition for at least 10 seconds while the machine is providing 3 times rated current.

Comply with NEMA MG 1.

Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

Alternator: The alternator shall have all insulation system components meeting NEMA MG1 standard temperature limits for Class H insulation system. Actual temperature rise measured by resistance method at full load shall not exceed 105 degrees C based on a 40 C ambient temperature to provide additional allowance for internal hot spots.

Stator-Winding Leads: Brought out to terminal box.

Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.

Enclosure: Weatherproof.

Instrument Transformers: Mounted within generator enclosure if required.

Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified. The generator set shall include an automatic microprocessor-based voltage regulation system that is matched and prototype tested by the engine manufacturer with the governing system provided. It shall be immune from mis-operation due to load induced voltage waveform distortion and provide a pulse width modulated output to the alternator exciter. The voltage regulation system shall be equipped with three phase RMS sensing and shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. The voltage regulation system shall be based on a full wave rectified input, pulse-width modulated (PWM) output design. The system shall include a torque matching characteristic, which shall reduce output voltage in proportion to frequency below an adjustable frequency threshold. The voltage regulator shall include adjustments for gain, damping, and frequency roll off. Adjustments shall be broad range, and made via digital raise-lower switches, with an alphanumeric LED readout to indicate setting level. Rotary potentiometers for system adjustments are not acceptable.

Strip Heater: Provide thermostatically controlled heaters arranged to maintain stator windings above dew point.

Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

Subtransient Reactance: 11 percent, maximum.

For units above 600 volts, provide two (2) RTD's in each phase of the alternator stator windings. The temperature of each phase is to be displayed through the local generator control panel. The temperature of each phase shall be available over the ModBus communications signal from the generator co

LOAD BANK

Description: Permanent, outdoor radiator mounted air-cooled, resistive unit capable of providing a balanced 3-phase, delta-connected load to generator set at 50 percent of the generators stand-by rating unity power factor. Unit shall be capable of selective control of load down to 5KW.

Resistive Load Elements: Corrosion-resistant chromium alloy with ceramic and steel supports. Elements shall be double insulated and designed for repetitive on-off cycling. Elements shall be mounted in removable aluminized-steel heater cases.

Load-Bank Heat Dissipation: Airflow and coil operating current shall be such that, at maximum load, with ambient temperature at the upper end of specified range, load-bank elements operate at not more than 50 percent of maximum continuous temperature rating of resistance elements.

Load Element Switching: local controlled contactors switch groups of load elements. Contactor coils are rated 120 V. Contactors shall be located in a separate NEMA 250, Type 4x enclosure within generator enclosure.

Protective Devices: Power input circuits to load banks shall be fused, and fuses shall be selected to coordinate with generator circuit breaker. Fuse blocks shall be located in contactor enclosure. Cooling airflow and over temperature sensors shall automatically shut down and lock out load bank until manually reset. Safety interlocks on access panels and doors shall disconnect load power, control, and heater circuits. Short-circuit devices shall be non-interchangeable fuses with 200,000-A interrupting capacity.

Control Panel: Remote mounted with a control power switch and pilot light, and switches controlling groups of load elements. The control panel shall monitor the generator output and be capable of maintaining a minimum load on the generator at all times during normal operation. Automatic loading shall be accomplished with a minimum of five (5) steps.

Control Sequence: Control panel may be preset for adjustable single-step loading of generator during automatic exercising.

OUTDOOR GENERATOR-SET ENCLOSURE

683.090700WE MOVABLE BRIDGE STANDBY GENERATOR

A skin tight custom sound attenuated enclosure shall be provided to house the generator and radiator mounted loadbank. The enclosure is to be in compliance with the National Electrical Code (NEC) and the National Fire Protection Association (NFPA) as applicable. Refer to project drawings for additional enclosure requirements. Enclosure and tank will be as manufactured by Cummins Power Generation or engineer pre-approved custom manufacturer. No substitutions will be accepted.

Design Outline:

Rigidity wind set equal to 180 MPH
Enclosure will consist of a roof, underframe, side walls, end walls and built with semi-monocoque construction.

The system shall include a cooling and combustion air inlet silencer section, an equipment enclosure section, and a cooling air discharge silencer section.

Roof and walls shall each be of one-piece, semi-monocoque construction. All framing members shall be steel. Skin material shall be min. thickness 0.040" pre-painted aluminum. Skin panels shall be interlocked to framing members on 24" centers maximum. Pop rivets and bolts are not acceptable fasteners to attach exterior skin to framing. Roof assembly shall be cambered to aid in rain runoff.

Insulation in walls and roof shall be semi-rigid, thermo-acoustic with thickness as required to meet the noise criteria specified and with a flame spread of 10, fuel contributed 0 and smoke developed 0. Lining shall be perforated18 gauge .040, mill-finish aluminum. Self-adhesive foam and loose or bat-type insulating materials will not be accepted. The enclosure shall be acoustically rated for 72 dbA @ 23 feet with both generators in operation.

Lifting provisions shall be provided at or near the enclosure base, with capacity and number suitable for rigging the entire assembly.

Single and/or double access doors shall be provided. Doors shall consist of an extruded aluminum frame with skin material matching enclosure. Doors shall be fully gasketed to form a weather tight perimeter seal. Hinges shall be forged aluminum with stainless steel pins, handles shall be stainless steel and lockable, and lock mechanism shall be three-point, with panic hardware (if necessary for walk-in enclosures) to allow opening from inside even when locked. All door opening include an overhead rain gutter for channeling rainwater away from the enclosure.

Air handling shall be as follows: Air will enter the enclosure from the bottom through one or more intake hoods. Optional motor operated damper(s) shall be provided, wired to open at engine startup. Radiator discharge will be through a gravity operated damper and into a vertical discharge plenum through the top as dictated by airflow. The system shall not exceed 0.5" w.g. total external static pressure to endure adequate airflow for cooling and combustion.

Enclosure manufacturer shall internally or externally mount, pipe, and optionally insulate low profile exhaust silencer while maintaining the weatherproof integrity of the system. The exhaust outlet shall be terminated within the discharge plenum.

GENERATOR ENCLOSURE ELECTRICAL PACKAGE (PER GENERATOR):

An electrical package shall be installed by the enclosure manufacturer prior to shipment as follows:

(3) 20 Ampere, 120 Volt, 1 phase circuit breakers (sub-panel) or as indicated on the project

drawings.

Internal LED fixtures

1 - light switch

(1) Duplex GFI receptacle.

The sub-base tank alarms shall be completely wired.

All external wiring shall be done in PVC-RGS conduit.

Electrical connections for coolant heater, battery charger and day tank pumps (if specified) shall be provided as required.

DOUBLE WALL SECONDARY CONTAINMENT SUB-BASE FUEL TANK:

Each generator enclosure shall include a 48 hour (usable) sub-base fuel tank dedicated to the associated generator. Each fuel storage and delivery system shall be designed as follows:

The sub-base fuel system shall be listed UL 142 and shall carry a UL label.

The above-ground steel secondary containment rectangular tank for use as a sub-base for diesel generators is manufactured and intended to be installed in accordance with the Flammable and Combustion Engine and Gas Turbines-NFPA 37, AND Emergency and Standby Power Systems-NFPA 110.

Construction: (UL-142) secondary containment with 110% basin.

Primary Tank shall be rectangular in shape and constructed in clam shell fashion to ensure maximum structural integrity and allow the use of a full throat fillet weld.

Primary Tank shall have a Steel Channel Support System.

Reinforced steel box channel for generator support, with specified load rating for each generator set. Full height gussets at either end of channel and at generator set mounting holes shall be utilized.

Normal venting shall be sized in accordance with the American Petroleum Institute Standard No 2000, Venting Atmospheric and low Pressure Storage Tank not less than 1-1/4" (3 cm.) nominal inside diameter. An atmospheric mushroom cap shall be furnished and the installing contractor shall pipe above the highest fill point as a minimum.

The emergency vent opening shall be sized to accommodate the total capacity of both normal and emergency venting and shall be not less than that derived from NFPA 30, table 2-8, and base on the wetted surface area of the tank. The wetted area of the tank shall be calculated basis of 100 percent of the primary tank. A zinc plated emergency pressure relief vent cap shall be furnished for the primary tank. The vent shall be spring-pressure operated with an opening is 0.5/psig and full opening pressure of 2.5 psig. Limits shall be stamp marked on top each vent. The emergency relief vent shall be sized to accommodate the total venting capacity of both normal and emergency vents.

There shall be an NPT opening within the primary tank with a raised fill pipe and lockable manual fill

cap. The fill piping shall be routed to the exterior of the enclosure and shall include 5 gallon spill containment, level indicator and remote fill alarm panel.

The fuel tank shall be installed beneath the floor mounted within a combined rupture basin/floor/underframe. The interstitial space between the tank and basin shall be monitored (through electronic means) to indicted a rupture condition.

CONNECTION FOR PORTABLE GENERATORS

Provide a portable generator docking station to facilitate temporary connection of a portable generator for the emergency/ life safety building loads if the permanent emergency generator is unavailable due to maintenance or extended repair. Breaker configuration shall be as indicated on the project drawings.

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.

UL (Underwriters Laboratories, Inc.) Standards

Comply with NFPA 70.

Manufacturers: Subject to compliance with requirements, provide products by the following:
Axis Controls
TRYSTAR
Foxfab

Enclosures:
Outdoor wall mounted cabinet.
Temporary cabling from a portable generator shall enter through the front face of the lower section through an access door in the switchgear enclosure.
Tap box shall include rear access through the interior of the switchgear enclosure.
NEMA 4X stainless construction.

Phase, Neutral, and Ground Buses:
Material: Tin-plated copper.
Equipment Ground Bus: Bonded to box.
Isolated Ground Bus: insulated from box.
Ground Bus: 25% of phase size.
Neutral Bus: Neutral bus rated 100 percent of phase bus.
Round edges on bus.
Provided labeling as necessary indicating system bonding requirements.

Input connections for the portable generator shall be Cam style mounted on 45-degree plate inside locking door. Cam connections shall be color coated for 480/277 volts AC.

Output connections shall be mechanical lugs.

Voltage shall be 480/277 V, 3 phase, 4 -wire. Amperage shall be 400 amps.

Additional Options:

Phase rotation indicator.
120/240 volt, 30 amp twist lock receptacle for portable generator.
Portable generator start signal termination.
Anti-condensation heater.
Integral Manual Transfer Switch
"Floating Neutral" Requirement Nameplate

FINISHES

Outdoor Enclosures and Components: Final finish over corrosion-resistant pretreatment and compatible primer to be Onan green. Three (3) samples of min 6"X6" to be submitted for review and approval.

EXECUTION

GENERAL

The cost of removal of existing items, as shown on plans, or if items are replaced as called out in this specification, shall be included in the bid price of this item.

EXAMINATION

Vendors shall examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.

Vendors shall examine roughing-in of piping systems and electrical connections. Assist in verifying actual locations of connections before packaged engine-generator installation.

INSTALLATION (by electrical contractor)

The pre-purchased equipment will be installed by contractors selected by the County. Generator vendor is to include coordination with site installation contractors.

Contractors will comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.

Contractors will install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.

Contractors will secure sets to anchor bolts installed to steel. Coordinate installation with structural drawings & approved shop drawings.

Contractors will install electrical devices furnished by equipment manufacturers but not specified to be factory mounted. Generator vendor to include a list of all interconnecting conduit, wire and mechanical piping that cannot be pre-installed by the enclosure vendor.

CONNECTIONS (by electrical and mechanical contractors)

All piping, wiring, connections required shall be in accordance with manufacturer installation & approved shop drawings. Refer to contract drawings & specifications for general arrangement of piping and specialties.

Connect fuel piping adjacent to packaged engine generator to allow service and maintenance.

Connect engine exhaust pipe to engine with flexible connector.

Connect fuel piping to engines with a gate valve and union and flexible connector.

Ground equipment according to NEC.

Connect wiring according to approved shop drawings

FACTORY TESTING OF EMERGENCY GENERATORS

Prior to shipment to the enclosure manufacturer, the generator sets shall be tested at the generator assembly plant to verify proper operation of all alarms and shutdown circuits as well as a full load test. These tests may be performed in the presence of the Engineer and or Owner's representative if requested. Expenses for the owner and engineer's travel and accommodation to the tests at the generator assembly plant will be paid for by the owner if witnessing is requested.

The test shall also demonstrate compliance with the set performance criteria as specified herein.

Provide all resistive and reactive load banks and power cables to achieve full rated load at 0.80 power factor for the duration of the tests.

All test instruments shall be standard meters with certified calibration within the last 12 months.

Provide labor to connect all load banks, test instrumentation and conduct the testing.

ALARMS – Demonstrate, at a minimum, proper operation of all functions and alarms for each generator as outlined in this specification.

LOAD TEST - Each generator shall undergo load testing verify voltage and frequency regulation as well as generator set capability. Record the following parameters for inclusion in the factory acceptance report. Test results will be reported on the Standard Performance Specification Forms of the National Electrical Manufacturer's Association.

Output voltage, current, frequency, kilowatts, power factor.

Engine parameters: Oil pressure, water temperature, etc.

Ambient conditions.

Minimum duration shall be 2 hours at .8 PF.

Provide the Engineer/Owner certified test results for approval prior to delivering any equipment to the site.

The manufacturer of the generator set will provide an insulation resistance test per NEMA Standard MG-1, section numbers 12.02 and 12.03. Test results will be reported on the standard forms for generators of the National Electrical Manufacturers Association. The manufacturer will certify all test reports and curve sheets and five copies of each will be submitted and approved by the Engineer prior to shipment from the factory.

FIELD QUALITY CONTROL TEST

Manufacturer's Field Service: Engage field service representatives who are direct employees of the engine manufacturer to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Assist owner's testing agency with all testing and report results in writing.

Tests and Inspections:

Repeat the factory test procedure as outlined in section 3.5 above at unity PF, except that the duration of the full load heat run shall be extended to 4 hours. Fuel for site testing shall be supplied by the contractor. Supplemental load banks will be supplied by the generator vendor.

NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here including, but not limited to, single-step full-load pickup test.

Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.

Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.

Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.

Verify acceptance of charge for each element of the battery after discharge.

Verify that measurements are within manufacturer's specifications.

Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.

System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.

Exhaust Emissions Test: Comply with applicable government criteria.

Noise Level Tests: Equipment not meeting the acoustical performance and documentation as outlined in the specifications above shall be field tested to substantiate acoustical performance. Site measurements shall include the dba and A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge. Sound levels shall be taken at 7 meters from each side of the unit and at the facility property lines and compare measurement levels with required values.

Integrated System Testing: Supplier shall provide on-site support for the duration of equipment integrated system testing. A minimum of three man days shall be included in the Bid. Support shall be dedicated to this project and assigned to work continuously until successful integrated system testing completion.

Alarm Demonstration Tests: Demonstrate all monitored pre-alarms, alarms, power metering and statuses associated with the generator at the generator control panel, ATS and Electrical Power Monitoring (EMPS) system displays.

If the equipment fails to meet Specification requirements during the site acceptance tests, the Supplier shall correct the cause of the failure and repeat the tests to the satisfaction of the Owner.

Take oil and coolant sample following completion of site test and perform laboratory evaluation to determine presence of unwanted metals and liquids. Submit report to Owner.

The Site Acceptance Testing Report shall be submitted to the Engineer and Commissioning Agent in hard copy and soft copy for approval. The approved Site Acceptance Testing Report will be submitted to the Owner as a part of the Closeout Documents.

Coordinate tests with tests for transfer switches and/or PLC controlled circuit breakers and run them concurrently.

Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

Remove and replace malfunctioning units and retest as specified above.

Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

Infrared Scanning: After Substantial Completion, but not more than 60 days after final acceptance, the contractor will perform an infrared scan of each power wiring termination and each bus connection. Remove all access panels so terminations and connections are accessible to portable scanner.

Follow-up Infrared Scanning: Perform an additional follow-up infrared scan 11 months after date of Substantial Completion.

Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

Record of Infrared Scanning: Prepare a certified report that identifies terminations and connections checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

Cleaning: Upon completion of installation, inspect system components for paint splatters, spots, dirt, debris, scratches, mars of finish and cleanliness. Furnish Contractor a list of items to be corrected and instruct Contractor on cleaning methods and materials to be used. At the end of the cleaning, check if the equipment matches the original finish.

DEMONSTRATION AND TRAINING

Engage a factory-authorized service representative who is a direct employee of the manufacturer to train owner's maintenance personnel to adjust, operate, and maintain packaged engine generators. Provide a minimum of 8 hours of classroom and field time for training. Provide a video of the training session along with any printed materials used during testing.

MEASUREMENT AND PAYMENT

Payment will be made on a lump sum basis.

The lump sum price bid for Standby generator will include the cost of all materials, labor, equipment, plant, operation and maintenance manuals, testing, testing equipment and equipment necessary for a complete installation, ready for operation as well as the removal and lawful disposal of the existing equipment being replaced/removed.

The Contractor will submit to the Engineer a detailed breakdown of his costs, not to exceed the bid price for this item, within 30 working days of award of the contract. The cost breakdown, once approved by the Engineer, will serve as a method of measurement of work completed so that partial payments may be made to the Contractor by the Owner. The cost breakdown will include separate prices for the following items:

Providing and storing of all materials and products, including those with long lead-time, at the bridge site or at a facility approved by the Engineer.

Final acceptance field-testing, bridge operator and maintenance personnel training, operation and maintenance manuals and as-built Plans.

10 percent retainage of bid price until final bridge acceptance, and Engineer-approval of operation and maintenance manuals and as-built Plans.

This breakdown will be evaluated by the Engineer and an equitable basis of payment will be established. Payments to the Contractor will not be made until the cost breakdown is submitted and approved by the Engineer. Progress payments for work satisfactorily completed will be made in accordance with the Standard Special Provisions.

The Department will make payment for the Items as follows:

Pay Item	Pay Unit
683.090700WE Movable Bridge Standby Generator	LS

END OF SECTION

ITEM 685.0715XX10 - EPOXY REFLECTORIZED PAVEMENT MARKINGS 15 MILS THICK (WET NIGHT VISIBILITY SPHERES)
ITEM 685.0720XX10 - EPOXY REFLECTORIZED PAVEMENT MARKINGS 20 MILS THICK (WET NIGHT VISIBILITY SPHERES)

DESCRIPTION:

Under this work the contractor shall furnish and apply epoxy reflectorized pavement markings in accordance with these specifications, the Contract Documents, the NYSMUTCD, or as ordered by the Engineer. Items for Special Markings include stop bars and crosswalks.

Yield line symbols are isosceles triangles with height equaling 1.5 times the base dimension:
A small yield line symbol shall have a base dimension of one foot.
A large yield line symbol shall have a base dimension of two feet.
Yield line symbols are to be installed with the Apex of the triangle oriented towards oncoming traffic.

The epoxy marking material shall be hot-applied by spray methods onto bituminous and portland cement concrete pavement surfaces at the thickness and width shown on the Contract Documents. Following a simultaneous application of Standard Glass Beads (Type 2) and Wet/Night Visibility Beads (Type 1), the cured epoxy marking shall be an adherent reflectorized stripe that will provide wet night retro-reflectivity.

MATERIALS REQUIREMENTS:

Epoxy Paint	727-03
Glass Beads for Pavement Markings	727-05

Reflective Glass Spheres

Retro-reflective beads shall be a double drop system of glass spheres consisting of Standard Beads (Type 2) and Wet/Night Visibility Beads (Type 1) as defined in §727-05 Glass Beads for Pavement Markings.

EPOXY APPLICATING EQUIPMENT

In general, a mobile applicator shall be a truck mounted, self-contained pavement marking machine, specifically designed to apply epoxy resin materials and reflective glass spheres in continuous line patterns. The applicating equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of cross hatching and other special patterns as directed by the Engineer.

At any time throughout the duration of the project, the Contractor shall provide free access to his epoxy applicating equipment for inspection by the Engineer or his authorized representative.

The Engineer may approve the use of a portable applicator in lieu of mobile truck mounted accessories for use in applying special markings only, provided such equipment can demonstrate satisfactory application of reflectorized epoxy markings in accordance with these specifications.

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Mobile applicating equipment shall be capable of installing up to 19 miles of epoxy reflectorized pavement markings in an eight hour day and shall include the following features:

1. Individual tanks for the storage of Part A and Part B of the epoxy resin.

2. Individual tanks for the storage of Standard (Type 2) and Wet/Night Visibility (Type 1) glass spheres. Each tank shall have a minimum capacity of 3000 lbs.

3. Heating equipment of sufficient capacity to maintain the individual epoxy resin components at the manufacturer's recommended temperature for spray application.

4. Individual dispensers for the simultaneous application of Standard (Type 2) and Wet/Night Visibility (Type 1) glass spheres. Each dispenser shall be capable of applying spheres at a minimum rate of 10 lbs/gal of epoxy resin composition.

5. Metering devices or pressure gauges on the proportioning pumps, positioned to be readily visible to the Engineer.

6. All necessary spray equipment, mixers, compressors, and other appurtenances for the placement of epoxy reflectorized pavement markings in a simultaneous sequence of operations as described in Construction Details, D. Application of Epoxy Reflectorized Pavement Markings.

CONSTRUCTION DETAILS

A. General

All pavement markings shall be placed as shown on the Contract Documents and in accordance with the New York State, Manual of Uniform Traffic Control Devices (MUTCD).

Before any pavement marking work is begun, a schedule of operations shall be submitted for the approval of the Engineer.

At least five (5) days prior to starting striping, the Contractor shall provide the Engineer with the epoxy manufacturer's written instructions for use. These instructions shall include, but not be limited to, material mixing ratios and application temperatures.

When pavement markings are applied under traffic, the Contractor shall provide all necessary flags, markers, signs, etc. in accordance with the MUTCD to maintain and protect traffic, and to protect marking operations and the markings until thoroughly set.

The application of pavement markings shall be done in the general direction of traffic. Striping against the direction of traffic flow shall not be allowed.

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The Contractor shall be responsible for removing, to the satisfaction of the Engineer, all tracking marks, spilled epoxy, and epoxy markings applied in unauthorized areas.

When necessary the Contractor shall establish marking line points at 30 foot intervals throughout the length of the pavement or as directed by the Engineer.

B. Atmospheric Conditions

Epoxy pavement markings shall only be applied during conditions of dry weather and on substantially dry pavement surfaces. At the time of installation the pavement surface temperature shall be a minimum of 50°F and the ambient temperature shall be a minimum of 50°F and rising. The Engineer shall be the sole determiner as to when atmospheric conditions and pavement surface conditions are such to produce satisfactory results.

C. Surface Preparation

The Contractor shall clean the pavement and existing durable markings to the satisfaction of the Engineer.

Surface cleaning and preparation work shall be performed only in the area of the epoxy markings application.

At the time of application all pavement surfaces and existing durable markings shall be free of oil, dirt, dust, grease and similar foreign materials. The cost of cleaning these contaminants shall be included in the bid price of this item.

In addition, concrete curing compounds on new portland cement concrete surfaces and existing painted pavement markings on both concrete and bituminous pavement surfaces shall be cleaned and paid for in accordance with §635 Cleaning and Preparation of Pavement Surfaces for Pavement Markings.

D. Application of Epoxy Reflectorized Pavement Markings

Epoxy reflectorized pavement markings shall be placed at the width, thickness, and pattern designated in the Contract Documents.

Marking operations shall not begin until applicable surface preparation work is completed and approved by the Engineer, and the atmospheric conditions are acceptable to the Engineer.

Pavement markings shall be applied by the following simultaneous operation:

1. The pavement surface is air-blasted to remove dirt and residues.

2. The epoxy resin, mixed and heated in accordance with the manufacturer's

recommendations, is uniformly hot-sprayed onto the pavement surface at the minimum specified thickness.

3. Standard (Type 2) and Wet/Night Visibilty (Type 1) reflective glass spheres are injected into or dropped onto the liquid epoxy marking. Standard beads (Type 2) shall be applied first immediately followed by the application of Wet/Night Visibilty beads (Type 1). Each type shall be applied at a minimum rate of 10 lbs/gal of epoxy resin (minimum total application = 20 lbs/gal).

E. Defective Epoxy Pavement Markings

Epoxy reflectorized pavement markings, which after application and curing are determined by the Engineer to be defective and not in conformance with this specification, shall be repaired. Repair of defective markings shall be the responsibility of the Contractor and shall be performed to the satisfaction of the Engineer as follows:

1. Insufficient film thickness and line width; insufficient glass bead coverage or inadequate glass bead retention.

   Repair Method. Prepare the surface of the defective epoxy marking by grinding or blast cleaning. No other cleaning methods will be allowed. Surface preparation shall be performed to the extent that a substantial amount of the reflective glass spheres are removed and a roughened epoxy marking surface remains.

   Immediately after surface preparation remove loose particles and foreign debris by brooming or blasting with compressed air.

   Repair shall be made by restriping over the cleaned surface in accordance with the requirements of this specification and at the full thickness indicated on the Contract Documents.

2. Uncured or discolored epoxy*; insufficient bond (to pavement surface or existing durable marking).

   Repair Method. The defective epoxy marking shall be completely removed and cleaned to the underlying pavement surface in accordance with the requirements of Section 635 - Cleaning and Preparation of Pavement Surfaces, at the Contractor's expense.

   The extent of removal shall be the defective area plus any adjacent epoxy pavement marking material extending three feet in any direction.

   After surface preparation work is complete, repair shall be made by reapplying epoxy over the cleaned pavement surface in accordance with the requirements of this specification.

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*Uncured epoxy shall be defined as applied material that fails to cure (dry) in accordance with the requirements of §727-03 Epoxy Paint; or applied material that fails to cure (dry) within a reasonable time period under actual field conditions, as defined by the Engineer.

Discoloration shall be defined as localized areas or patches of brown, grayish or black colored epoxy marking material. These areas often occur in a cyclic pattern and often are not visible until several days or weeks after markings are applied.

Other defects not noted above, but determined by the Engineer to need repair, shall be repaired or replaced as directed by and to the satisfaction of the Engineer.

All work in conjunction with the repair or replacement of defective epoxy reflectorized pavement markings shall be performed by the Contractor at no additional cost to the State.

METHOD OF MEASUREMENT

Pavement striping (regular lines, cross hatching and special markings) will be measured in feet along the centerline of the pavement stripe and will be based on a 4 inch wide stripe. Measurement for striping with a width greater than the basic 4 inches, as shown on the plans or directed by the Engineer, will be made by the following method:

$$\frac{\text{Plan Width of Striping (inches)} \times \text{Feet}}{4 \text{ inches}}$$

BASIS OF PAYMENT

The accepted quantities of markings will be paid for at the contract unit price, which shall include the cost of furnishing all labor, materials and equipment to satisfactorily complete the work. The cost for maintaining and protecting traffic during the marking operations shall be included in the price bid. The cost of removal of concrete curing compounds and existing pavement markings will be paid under separate items and are not included in this item.

No payment will be made for the repair or replacement of defective epoxy reflectorized pavement markings.

PAY ITEM NO.	***DESCRIPTION***	***PAY UNIT***
685.07150110	White Epoxy Reflectorized Pavement Stripes – 15 mils	Foot

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685.07150210	(Wet Night Visibility Spheres) White Epoxy Reflectorized Pavement Letters - 15 mils	Each
685.07150310	(Wet Night Visibility Spheres) White Epoxy Reflectorized Pavement Symbols – 15 mils	Each
685.07150410	(Wet Night Visibility Spheres) White Epoxy Reflectorized Cross Hatching -15 mils Thick	Foot
685.07150510	(Wet Night Visibility Spheres) White Epoxy Reflectorized Pavement Stripes (Special Markings) 15 mils Thick (Wet Night Visibility Spheres)	Foot
685.07150610	Yellow Epoxy Reflectorized Pavement Stripes – 15 mils (Wet Night Visibility Spheres)	Foot
685.07150710	Yellow Epoxy Reflectorized Pavement Stripes (Cross Hatching) 15 mils Thick (Wet Night Visibility Spheres)	Foot
685.07150810	White Epoxy Reflectorized Pavement Yield Line Symbols - Small - 15 mils (Wet Night Visibility Spheres)	Each
685.07150910	White Epoxy Reflectorized Pavement Yield Line Symbols - Large - 15 mils (Wet Night Visibility Spheres)	Each
685.07200110	White Epoxy Reflectorized Pavement Stripes – 20 mils (Wet Night Visibility Spheres)	Foot
685.07200210	White Epoxy Reflectorized Pavement Letters – 20 mils (Wet Night Visibility Spheres)	Each
685.07200310	White Epoxy Reflectorized Pavement Symbols – 20 mils (Wet Night Visibility Spheres)	Each
685.07200410	White Epoxy Reflectorized Pavement Stripes (Cross Hatching) 20 mils Thick (Wet Night Visibility Spheres)	Foot
685.07200510	White Epoxy Reflectorized Pavement Stripes (Special Markings) 20 mils Thick (Wet Night Visibility Spheres)	Foot

ITEM 685.0715XX10 - EPOXY REFLECTORIZED PAVEMENT MARKINGS 15 MILS THICK (WET NIGHT VISIBILITY SPHERES)

ITEM 685.0720XX10 - EPOXY REFLECTORIZED PAVEMENT MARKINGS 20 MILS THICK (WET NIGHT VISIBILITY SPHERES)

685.07200610	Yellow Epoxy Reflectorized Pavement Stripes – 20 mils (Wet Night Visibility Spheres)	Foot
685.07200710	Yellow Epoxy Reflectorized Pavement Stripes (Cross Hatching) 20 mils Thick (Wet Night Visibility Spheres)	Foot
685.07200810	White Epoxy Reflectorized Pavement Yield Line Symbols - Small - 20 mils (Wet Night Visibility Spheres)	Each
685.07200910	White Epoxy Reflectorized Pavement Yield Line Symbols - Large - 20 mils (Wet Night Visibility Spheres)	Each

ITEM 699.020001WE – MOBILIZATION (2% MAXIMUM)

DESCRIPTION

Under this work the Contractor shall set up his necessary general plant, including shops, storage areas, office and such sanitary and other facilities as are required by local or state law or regulation. The Contractor shall also begin the process to acquire any necessary materials and/or equipment to complete the project in a timely manner.

MATERIALS

Such materials as required for mobilization and that 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.

CONSTRUCTION DETAILS

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 shall be maintained.

METHOD OF MEASUREMENT

Payment for mobilization will be made on a lump sum basis.

BASIS OF PAYMENT

The amount bid for mobilization shall not exceed two percent (2%) of the total contract bid price excluding the bid price for mobilization and any other items as specified in the contract proposal. Should the bidder exceed the foregoing two percent (2%), the Department 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 DESCRIPTION, to the extent and at the time the Contractor deems them necessary for his operations, consistent with the requirements of this work and the respective contract.

The amount bid shall be payable to the Contractor once ten percent (10%) of the monetary value of the contract has been completed.

Payment will be made under:

Item No.	Item	Pay Unit
699.020001WE	Mobilization (2% Maximum)	Lump Sum

ITEM 699.040002WE – CONTRACT BONDS AND INSURANCE

DESCRIPTION

Under this work the Contractor shall provide all necessary bonds, insurance, and pre-financing in accordance with §103-03 and§107-06 of the New York State Department of Transportation Standard Specifications including all updates and addenda and §5 and §7 of the Information For Bidders.

MATERIALS

None.

CONSTRUCTION DETAILS

The work required to provide all required contract bonds and insurance shall be completed prior to the start of construction.

METHOD OF MEASUREMENT

Payment will be made on a lump sum basis.

BASIS OF PAYMENT

The amount bid for contract bonds and insurance shall not exceed three percent (3%) of the total contract bid price excluding the bid price for mobilization, contract bonds and insurance and Miscellaneous Additional Work (Item 800.000000WE) and Testing Of Materials And Field Testing Equipment (Item 851.000000WE). Should the bidder exceed the foregoing three percent (3%), the Department will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

The amount bid shall be payable with the first contract payment.

Payment will be made under:

Item No.	Item	Pay Unit
699.040002WE	Contract Bonds and Insurance	Lump Sum

ITEM 800.000000WE - MISCELLANEOUS ADDITIONAL WORK

DESCRIPTION:

Under this item the Contractor shall furnish all labor, materials, and equipment required to accomplish miscellaneous additional work:

1. Necessitated by encountering during the course of the work field conditions of a nature not determinable during design; or

2. For which no unit prices are applicable

METHOD OF MEASUREMENT:

Only that miscellaneous work shall be performed by the Contractor and will be paid for by the County, which has been authorized by the Inspector in writing, prior to its commencement.

The dollar-cents amount set forth in the proposal is a fixed price for all bidders and shall not be changed. If the amount is altered, the new figure will be disregarded and the original amount used to determine the total amount bid for the contract.

Article 19 of the Information for Bidders, entitled " Increase or Decrease of Quantities: Elimination of Items", will still apply relative to the percentage of the total awarded contract price that the work under the contract may be increased or decreased.

PAYMENT:

The total amount paid the Contractor under this item will be determined in accordance with the provisions of Article 30 of the General Clauses, entitled " Extra Work: Increased Compensation/Decreased Work: Credit to the Owner", and such payment will include only that overhead and profit that is applicable to the work performed under this item.

Each contractor shall include in his total bid the price printed in the Proposal, and any bid other than the specified amount will be considered informal.

ITEM 851.000000WE - TESTING OF MATERIALS AND FIELD TESTING EQUIPMENT

DESCRIPTION:

Under this item the Contractor shall include in their bid the sum printed in the Proposal opposite this item for testing and inspection fees and costs and for the purchase of field testing equipment.

Contract items shall be tested and inspected as per the item specification in such amounts as directed by the Engineer. The laboratories and arrangements for this testing shall be made by the Engineer only.

Field testing equipment, as needed, shall be purchased for the Engineer's use according his direction. The equipment shall remain the property of the County.

The Contractor shall submit all bills and vouchers for testing and inspection services and costs and testing equipment to the Engineer for audit and approval before payment. After payment, a receipted copy of each bill or voucher shall be returned to the Engineer. All bids shall be paid within 30 days after their approval by the Engineer.

Bills not paid within 30 days will be paid by the County and the amounts of such payments shall be deducted from the Contractor's estimates together with a collection charge of 3% of the amounts so paid by the County.

In other parts of the contract documents, this item may be referred to as W851.

METHOD OF MEASUREMENT:

The dollar-cents amount set forth in the proposal is a fixed price for all bidders and shall not be changed. If the amount is altered, the new figure will be disregarded and the original amount used to determine the total amount bid for the contract.

PAYMENT:

The amount paid the Contractor under this item shall be the actual total amount of the bills and vouchers approved by the Engineer for testing and inspection of materials and purchase of field testing equipment and an additional five percent (5%) for administrative costs.

The amount printed on the Proposal appears for purpose of canvas. Any bid other than the specified amount will be considered informal. The actual amount spent may be more or less than the amount stipulated in the Proposal.