

Set No: 81

Project Manual

Contract No.: NC-34

Sturgeon Point Raw Water Pump Station Improvements

Project No. 201500175

September 2016

Files

Contract # 14-26-12
Budget Item #
L.S. #
Others - Bond Issue #
O.W.I.P. #
Expense #

Erie County Water Authority

295 Main Street, Room 350
Buffalo, New York 14203



#21

**Name of Person, Firm or
Corporation Submitting Bid:**

ERIE COUNTY WATER AUTHORITY
CONTRACT NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO. 201500175

ADDENDUM NO. 1
October 25, 2016

The attention of all Bidders is directed to the following changes to the Contract Documents:

TECHNICAL SPECIFICATION CLARIFICATIONS

1. **CLARIFICATION:** This project does not contain a Buy America Steel Act Clause in regard to structural steel or valves.
2. Specification Section 00800 - SUPPLEMENTARY CONDITIONS, Part SC-4.02
CLARIFICATION: Copies of the reports and drawings referenced in this section are available for review at the office of Nussbaumer & Clarke, Inc. at 3556 Lake Shore Road, Suite 500, Buffalo, NY 14219, upon two (2) business day's prior notice.
3. Specification Section 012700 - MEASUREMENT AND PAYMENT, Part 3.01.A.5.
CLARIFICATION: It is not anticipated that the CONTRACTOR will encounter rock; however, if rock is encountered, the CONTRACTOR will be compensated for rock removal through the Contingency Allowance. Rock in this instance shall be defined per Specification Section 312318, Part 1.3A "Site Rock: Solid mineral material with volume in excess of one (1) cu yd or solid material that cannot be removed with 3/4 cu yd capacity excavator without drilling, jack hammering, or blasting."
4. Specification Section 013110 - COORDINATION WITH OWNERS OPERATIONS, Part 1.06.A. **CLARIFICATION:** This section dictates the allowable shut downs and time limits on shut downs of specific items. Performance testing required by the Contract Documents may require longer periods of time than the permitted shut down time limits. Therefore, performance testing shall be permitted to be completed outside of the permitted shut down time limits.
5. Specification Section 013110 - COORDINATION WITH OWNERS OPERATIONS, Part 1.06.D.2. **CLARIFICATION:** The spray water piping system shall be demolished, disposed of and replaced in its entirety.

6. Specification Section 013110 – COORDINATION WITH OWNERS OPERATIONS, Part 1.06.D.4. **CLARIFICATION:** Sluice Gates Nos. 1 through 5 are functional, but are not watertight. The ECWA does not stop flow at any point. Work to be performed underwater as required. The cost of any temporary measures the Contractor deems necessary to complete this work shall be included in his lump sum bid. The bid documents did not assume that this work would be performed in the dry.
7. Specification Section 013300 – SUBMITTAL PROCEDURES, Part 1.15.A. **CLARIFICATION:** Note 15 of the minutes of the pre-bid meeting (attached hereto) are clarified herein to require the Contractor to provide professional grade high quality photographs.
8. Specification Section 040100 – MAINTENANCE OF MASONRY, Part 3.03.B. – Replacing Brick Masonry **CLARIFICATION:** The Contractor shall provide for the replacement of 100 brick masonry units in the lump sum bid. Brick beyond that quantity shall be paid for through the Contingency Allowance.
9. Specification Section 040100 – MAINTENANCE OF MASONRY, Part 3.03.D. – Repointing of deficient mortar joints **CLARIFICATION:** The Contractor shall provide for the repointing of all exterior mortar joints of the entire building.
10. Specification Section 099000 – PAINTING AND COATING, PART 3.06.A.1 **CLARIFICATION:** Both the existing and proposed CMU substrate within the Screen Room require painting.
11. Specification Section 099000 – PAINTING AND COATING, PART 3.06.B.1 **CLARIFICATION:** In addition to those substrates called out under this section, process water, potable water and gas piping shall be painted. The color of each type of pipe should match the ECWA's paint color code and/or match the color of the existing piping to which it attaches.
12. Specification Section 462160 - TRAVELING WATER SCREENS Part 3.02.B. **CLARIFICATION:** Installation shall be performed by Manufacturer's personnel.
13. Appendix E - Existing Sluice Gates Shop Drawings **CLARIFICATION:** Refer to Appendix E for existing sluice gate shop drawings.

BIDDING REQUIREMENTS MODIFICATIONS

1. Section 00100 – NOTICE TO BIDDERS, Second paragraph, second line: **REPLACE** "November 1, 2016" with "November 8, 2016", time and location remain unchanged.

TECHNICAL SPECIFICATION MODIFICATIONS

1. Specification Section 013110 – COORDINATION WITH OWNERS OPERATIONS, Part 1.06.D.3. **ADD:** "The construction of the temporary roof shall be at the discretion of the Contractor. The roof construction shall be such that it can withstand the weather and loading anticipated throughout the duration that it is in place. The Contractor shall submit shop drawings for approval of the roof construction prior to construction."

2. Specification Section 030100 – MAINTENANCE OF CONCRETE, Part 3.05.A. **REPLACE:** Table with the following:

Item	Quantity	Approximate Locations	Detail
Concrete Partial Depth Repair	50 s.f.	10 each	B4/S-503
Concrete Full Depth Repair	50 s.f.	10 each	B5/S-503
Concrete Vertical & Overhead Repair	50 s.f.	10 each	C4/S-503
Concrete Overhead Beam Repair	100 s.f.	1 each	C5/S-503

3. Specification Section 051200 - STRUCTURAL STEEL FRAMING, Part 1.04.C.1 - Fabricator: **DELETE** subparagraphs a. and b. **REVISE** paragraph 1. "Company specializing in fabricating products specified in this Section with minimum three years of documented experience."
4. Specification Section 051200 - STRUCTURAL STEEL FRAMING, Part 1.04.D.1 - Erector: **DELETE** subparagraphs a. and b. **REVISE** paragraph 1. "Company specializing in performing work of this Section with minimum three years of documented experience."
5. Specification Section 051200 - STRUCTURAL STEEL FRAMING, Part 1.04.E.1 – Shop Painter: **DELETE** subparagraphs a., b. and c. **REVISE** paragraph 1. "Company specializing in performing Work of this Section with minimum three years of documented experience."
6. Specification Section 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 2.03.A. **REPLACE:** A. "Existing Runway Girders shall remain. The Contractor shall remove, dispose of and replace runway rails. Existing runway rails are connected to the runway girder by means of a mechanical/bolted connection."
7. Specification Section 262923 – VARIABLE FREQUENCY MOTOR CONTROLS, **ADD:** Motor Name Plate Table as Part 3.02.C. (Refer to attached table)
8. Specification Section 331100 – BURIED PIPING INSTALLATION, Part 1.02: **ADD:**
- B. CONTRACTOR'S Qualifications:
1. CONTRACTOR shall have a minimum of five (5) years of experience installing prestressed concrete cylinder pipe, fittings, and appurtenances.
 2. A list of qualifications shall be submitted including:
 - a. The number of years your organization has been installing prestressed concrete cylinder pipe under your present name.
 - b. Any projects similar to this project completed by your organization. Include all projects completed within the last three (3) years and all projects completed for the Authority specifically within the last five (5) years.
 - c. List the names of any company that has operated under the umbrella of your organization and the projects that they have completed.

C. Welder's Qualifications:

- a. All welders and welding operators shall be qualified under AWS D1.1 Structural Welding Code – Steel, under AWS D1.3 Structural Welding Code – Sheet Steel, or under Sec. IX of the ASME Boiler and Pressure Vessel Code for Welding P – No. 1 (carbon or low alloy) steels. For the purpose of this standard, welders and the welding operators qualified under Sec. IX of the ASME Boiler and Pressure Vessel Code to weld P – No. 1 steels shall be deemed qualified to weld any combination of steels listed in Sec. 4.6 of AWWA C-301. Each welder and welding operator shall have been qualified or requalified within the past three (3) years.
9. Specification Section 400523.15 – GATE VALVES **ADD:** Specification Section in its entirety. (Refer to attached document)
 10. Specification Section 400557 – ACTUATORS FOR PROCESS VALVES AND GATES, Part 2.02.A. **ADD:** Limitorque® model L120 to the list of approved manufacturers.

DRAWING CLARIFICATIONS

1. Sheet 34 of 49 (D-501) – PROCESS GROUND LEVEL PROPOSED PLAN, Detail A5, Air Compressor Connection Detail **CLARIFICATION:** A marked up sketch of this detail has been provided showing approximate dimensions for informational purposes.
2. Sheet 34 of 49 (D-501) – PROCESS DETAILS, Detail C4, Proposed Domestic and Process Water Isometric Drawing **CLARIFICATION:** A marked up sketch of this detail has been provided showing approximate dimensions for informational purposes.
3. Sheet 36 of 49 (M-001) – MECHANICAL NOTES, SCHEDULES, AND DETAILS, Detail A1, Unit Heater Gas Connection Detail **CLARIFICATION:** A regulator is not required for the gas line going into the heater.

DRAWING MODIFICATIONS

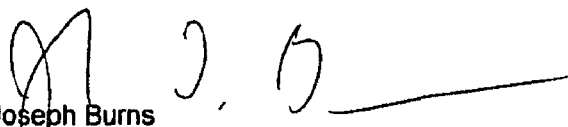
1. Sheet 13 of 49 (SD104) – STRUCTURAL FRAMING DEMOLITION PLAN, **ADD:** Note No. 1 Contractor is to remove, store and reinstall existing monorail crane trolley and hoist.
2. Sheet 16 of 49 (S-505) – STRUCTURAL DETAILS, **ADD:** Detail A5, Check Valve Support Detail. (Refer to attached sketch S-1)
3. Sheet 20 of 49 (S-505) – STRUCTURAL DETAILS, Detail A1, Gantry Crane Section View, **REPLACE:** Callout “Gantry Crane Trolley” with “Existing monorail crane trolley and hoist to be reinstalled.” **REPLACE:** Detail Title, A1, “Monorail Crane Section View”.
4. Sheet 27 of 49 (A-301) – ARCHITECTURAL PROPOSED BUILDING SECTIONS, A1 & A3 Proposed Wall Sections, **ADD:** Callout pointing to CMU core “Fill masonry core with perlite fill insulation”.

- 5. Sheet 30 of 49 (D-101) – PROCESS BASEMENT LEVEL PROPOSED PLAN, **ADD:** Callout at Raw Water Pump No. 1. "Install pipe floor supports per A5/S-501 (Typical of 5)". **REPLACE:** Plan Title," 1, Process Basement Level Proposed Plan". **ADD:** Note "All sump pump inflow and discharge piping shall be PVC."
- 6. Sheet 37 of 49 (M-101) – MECHANICAL GROUND LEVEL PROPOSED PLAN, **REPLACE:** Drawing Keyed Note No. 1 with the following: "ZURN 5" FLOOR DRAIN MODEL Z415B OR EQUAL. CONNECT TO EXISTING DRAINAGE IN THE BASEMENT. (TYPICAL OF 3)."
- 7. Sheet 44 of 49 (E-501) – ELECTRICAL DETAILS – EXHAUST FANS, A1, Proposed EF-1 Details, **REVISE:** 15A/3P circuit breaker with 30A/3P.
- 8. Sheet 49 of 49 (E-602) – ELECTRICAL PANEL SCHEDULES, **REVISE:** Panel Schedule "RW-B-LP" change circuit 27/29/31, 15A/3P circuit breaker with 30A/3P. Change circuit wiring from panel to motor starter from #12 to #10.
- 9. Sheet 49 of 49 (E-602) – ELECTRICAL PANEL SCHEDULES, **REVISE:** Panel Schedule "RW-B-LP-S" change circuit 20, 20A-1P circuit breaker with 20A/1P GFCI type circuit breaker.

SPECIAL NOTICE

This Addendum No. 1, including all attachments, shall be inserted into the Specifications and submitted with the Bid, and shall be signed by the Bidder in the space provided below.

ERIE COUNTY WATER AUTHORITY



Joseph Burns
Secretary to the Authority

CONSULTING ENGINEER:

Nussbaumer & Clarke, Inc.
Suite 500
3556 Lake Shore Road
Buffalo, New York 14219
716-827-8000
716-826-7958 fax

Signature of person, firm, or corporation making bid:

Signature

Title

Attachments:

1. Minutes of October 19, 2016 Pre-Bid Meeting.
2. Sign-in Sheet of October 19, 2016 Pre-Bid Meeting.
3. Motor Name Plate Table
4. Specification Section 400523.15 – Gate Valves
5. D-501/A5, Enlarged View - marked up sketch
6. D-501/C4, Proposed Domestic and Process Water Isometric Drawing - marked up sketch
7. S-505/A5, Check Valve Support Detail

ERIE COUNTY WATER AUTHORITY
CONTRACT NC-304
STURGEON POINT WATER TREATMENT PLANT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO. 201500175

PRE-BID MEETING
October 19, 2016

MINUTES

1. Sign-in Sheet will be included in the minutes to the meeting, which will be issued as Addendum No. 1.
2. Bid Opening is on 11:00 a.m. on Tuesday, November 1, 2016 at the Ellicott Square Building. Certified check or bid bond must be submitted with bid, 5% of the amount of the bid. The entire Project Manual along with any addendums must be submitted.
3. All questions about the meaning or intent of the Bidding Documents shall be submitted to ENGINEER in writing. In order to receive consideration, questions must be received by ENGINEER at least ten (10) days prior to the date for the opening of Bids. Oral statements may not be relied upon and will not be binding or legally effective.
4. Contractor must comply with Section 139 of the State Finance Law. Applicable forms to verify this compliance are included in Section 00430, Bid Form Supplements.
5. Contractor must comply with the Authority's M/WBE policy included in Appendix A.
6. Successful bidder must use the Authority's Insurance Forms included in Appendix B.
7. Work is to be completed under one contract. There are not separate electrical, mechanical, or general contracts.
8. Work of the Project to be completed by the Contractor shall include all improvements to the existing Sturgeon Point Treatment Plant Raw Water Pump Station in the Town of Evans located at 722 Sturgeon Point Road, Derby, New York 14047 as shown on all Sheets identified with the numbers G-XXX, C-XXX, S-XXX, A-XXX, D-XXX, M-XXX, and E-XXX, and generally described as follows:
 - a. Construction of an addition to the Raw Water Pump Station.
 - b. Replacement of Raw Water screens.
 - c. Demolition of the spray water pumps.
 - d. Replacement of the discharge butterfly valves and check valves on the Raw Water Pumps.
 - e. Refurbish the 48" Raw Water discharge header.
 - f. Replacement of the bridge crane in the Pump Room.

- g. Replacement of the indoor lighting.
 - h. Improvements to the ventilation.
 - i. Replacement of doors, windows, louvers, and floor grating.
 - j. Replacement of the Pump Station roof.
 - k. Replacement of the sluice gates.
 - l. Installation of baffles in the Raw Water Pump Station wet well.
 - m. Installation of piping improvements for frazil ice control.
 - n. Replacement of the 42-inch Delivered Water Transmission Main including installation of Owner furnished materials.
 - o. Replacement of the motor controllers for the five Raw Water Pumps with variable frequency drives.
 - p. Replacement of 480V circuit breakers.
 - q. Replacement of the 208 volt motor control center.
 - r. Sump pump system for water infiltration in electrical conduits.
 - s. Demolition of abandoned 5KV switchgear.
 - t. Replacement of 2" and 4" potable and process water piping including installation of Owner furnished materials.
 - u. Repairs to existing concrete and masonry surfaces.
 - v. Removal, storage, handling, and disposal of hazardous waste materials identified per Appendix F.
 - w. Associated electrical, instrumentation, controls, and SCADA.
 - x. Performance tests.
 - y. Contingency Allowances.
9. The following items will be furnished by the Owner for installation by the Contractor regarding the 42-inch diameter Delivered Water Transmission Main.
- a. Ductile iron pipe – 220 LF.
 - b. 42-inch joint restraints – 28 each.
 - c. 45 degree mechanical joint bends – 7 each.
 - d. Solid sleeve adapters – 7 each.
 - e. Polywrap – 240 LF.
 - f. Filler rod for PCCP adapters – 12 LF.
 - g. PCCP joint diapers – 2 each.
 - h. 42" x 6" PCCP tapping saddle – 1 each.
 - i. PCCP bell by ductile iron pipe adapter – 1 each.
 - j. PCCP spigot by ductile iron pipe adapter – 1 each.
 - k. Fire hydrant – 1 each.
 - l. 6-inch gate valve – 1 each.
 - m. 6-inch tapping valve – 1 each.
 - n. 6-inch ductile iron pipe – 20 LF.
 - o. 6-inch joint restraints – 10 each.
 - p. Nuts, bolts, and washers for the 42" and 6" pipe fittings.
10. The following items will be furnished by the Owner for installation by the Contractor regarding the backflow prevention for the Raw Water Pump Station.
- a. 4-inch RPZ backflow preventer – 2 each.
 - b. 2-inch RPZ backflow preventer – 3 each.

11. The Coordination with Owners Operations, Section 013110, describe a general sequence of work and general provisions for system shutdowns. This sequence of operation will minimize shutdown of the water treatment plant and allows for startup and testing of the equipment. We direct your attention to this section as they may affect your need for labor to complete the project.
12. Substantial and Final Completion Dates: Refer to Article 3 of the Agreement (Section 00500).

Milestone M1: The replacement of the 42" Delivered Water Transmission Main shall be completed within 45 days of the Notice to Proceed.

Substantial & Final Completion: The Work shall be substantially completed by January 31, 2018, and completed and ready for final payment by February 28, 2018.

13. Coordinate work with other contractors including but not limited to the following:
 - a. Owner's electrical contractor: shut-downs and other ongoing work.
 - b. Contractor for Owner Contract OBG-12A, Sturgeon Point and Van de Water Improvements Project: staging areas and parking, access roads.
 - c. Contractor for Owner Contract OBG-12B, Sturgeon Point Outfall Rehabilitation: staging areas and parking, access roads.
 - d. Owner to replace 230V heaters with 120V on Pump Motors No. 2 and 3.

14. Section 013110 – Coordination with Owner's Operations:

The Contractors are reminded that the work is at a water treatment plant, which operates 24 hours a day, seven days a week. Shutdowns will be required to complete the work. Regardless, two weeks' notice will be required for any shutdown.

The period from Memorial Day to Labor Day of any calendar year is the Authority's peak pumping season. The Contractor's operations are restricted during this period.

15. Section 013300, Part 1.15.A – Construction Photographs

A Professional Photographer will be the only person allowed to take photographs at the site. His/her resume must be submitted to the Authority prior to being allowed on the site. Photographs taken by the Contractor will be rejected.

16. Section 015000, Part 1.12 – Security

There are restrictions for site access and access roads shown on the Drawings and described in this section. Likewise, security is a serious matter at this facility. Refer to Section 1.12C & D of this section regarding requirements for personnel and vehicles.

The Owner may elect to have the Contractor provide a guard at the main entrance to the facility. Payment would be part of the Contingency Allowance.

17. Section 013310 – Substitutions
The Contractor's attention is directed to the specifications for requirements for substitutions of materials and equipment.
18. Site visits:

Contractors will not be allowed to take photographs. There are photographs on the Contract Drawings which adequately represent the work and work area. If anyone requires additional time at the facility prior to bidding the project, contact Nussbaumer & Clarke, Inc. and we will make arrangements for you to have access to the site.

Contractors are permitted to touch anything or to open any electrical cabinets.
19. The Owner furnished material for the 42-inch Delivered Water Transmission Main that has been delivered is available for inspection, contact Nussbaumer & Clarke, Inc. and we will make arrangements for you to conduct an inspection.
20. Section 013543 – Environmental Procedures for Hazardous Materials
The attention of the Contractor is called to the fact that hazardous materials are present in the work site. Refer to the appendices. The Contractor shall comply with all local, State, and Federal laws.
21. The Contractor shall coordinate with the Owner's Safety programs and requirements including: lockout-tagout, confined space, materials safety data sheets, and chemical hazard.
22. Questions:
- a. Is there a Buy America Steel Clause for this project regarding structural steel and/or valves? **Post Meeting Note: Refer to Item 1 of the Technical Specification Clarifications of Addendum No. 1**
 - b. Who is the ECWA's Electrical Contractor? **O'Connell Electric is currently under a term maintenance agreement.**
 - c. What is the cutoff date to ask questions clarifying the bid documents? **Final Questions must be submitted by Saturday, October 22.**

PRE-BID MEETING

Project: ECWA Contract NC-34
 Sturgeon Point Water Treatment Plant
 Raw Water Pump Station Improvements
 Project No. 201500175

Date: October 19, 2016 at 10:00 am
 Location: Sturgeon Point Water Treatment Plant

NAME & TITLE	REPRESENTING	ADDRESS	FAX NO.	TELEPHONE
Michael Chirico Corporate Associate	Nussbaumer & Clarke	3556 Lake Shore Road Buffalo, NY 14219	716 826-7958	716 827-8000
Karl Rohde Project Manager	Nussbaumer & Clarke	3556 Lake Shore Road Buffalo, NY 14219	716 826-7958	716 827-8000
SHAWN DOYLE	HOK	770 RAVENSWOOD BLDG. TUNAWANDA, NY 14180	716-332-0467	716-332-0466
IAN ABZAM	CP CEMINELLE	2412 MAIN ST. BUFFALO, NY	716-855-1297	716-855-1200
Jon ADAMT	MOLLINBERG-BRETZ	300 SCOTT ST BUFFALO NY		716-614-7473
D. NUCCICCI	SII	309 SENECA DR. N JENNIFETTE PA 15044		724-261-2956
D. MADOFF	MES	7141 SENECA ELMA, NY		716-912-0142
K Hebdol	SENECA	9245 RT 1 240 WEST VALLEY NY		716-432-6484
B. KEATLEY	O'CONNELL	999 B RANSON RD LANCASTER		716-675-9010

NAME & TITLE	REPRESENTING	ADDRESS	FAX NO.	TELEPHONE
STEVE CAMPANELLA PRES MGR	APC/MINIEM	2421 MAIN ST. BUFFALO NY	855-1297	855-1200
Jim Riley SALES ENL	VOLLAND	75 INDRSBERG DR Cheek 14227	656-8899	818-7677
Mick Kuro	Komani Electric	245 (Cape Ave Suis 100 Tonawanda, NY 14150	206-0934	206 0858
PAUL SCOURAS	BISON PTA	1783 KENNOLLE AVE Kenilworth NY	874 9262	873 1448
BRAD HARSCHMAN	H&K SERVICES	12025 LEON RD LEON NY 14752	296-8142	785-0981
Dick Roberts	Kowley Co	19 Kowlesk Dr West Seneca NY 14224	675-4957	675-7245
Ryan Hoolihan	Foguson Electric	333 Elliott St. Buffalo NY	852-4887 852-4887	852-2010
SCOT HARSCHMAN	H&K	12025 LEON RD. LEON, N.Y. 14751	716-296-8142	716-296-5290
JASON RICE	STC CONST.	63 ZOAR VALLEY RD SPRINGVILLE, NY 14141	716-592-4367	716-592-3400
ROGER MILLER	WEISS INSTRUMENT	MT. LEBANON BLVD PITTSBURGH, PA 15234	412-344-1500	724-766-2175
BOB JATON	SIEMENS	8300 SUMMIT CENTER SYRACUSE NY 13050	315-409-9424 9424	315-409-9424

NAME & TITLE	REPRESENTING	ADDRESS	FAX NO.	TELEPHONE
CHAS GAN, PM	Ironworks Inc	155 CUMBERLAND AVE HARRISBURG, PA 17101	824-9913	822-8205
Bob Hengel	RW PTC	65 Mid County Dr. OP NY 14117	662-7149	662-3552
JASON MACK, PM	IPL	60 Depot St Buffalo, NY 14206	854-1828	854-1811
Adam DiFelice	CJR Electric	400 Ingham Ave Buffalo NY	362-5010	362-5000
FED SULLIVAN	SULLIVAN MATERIAL HANDLING	75 MAYFAIR LANE WINGED HORSE CLUB N.Y.	716 634-6408	716 468 8436
Len Kowalski	ECWA	3030 Union Rd Cheektowatch NY		685-8220

Motor Name Plate Table

	Pump Motor #1	Pump Motor #2	Pump Motor #3	Pump Motor #4	Pump Motor #5
Type	Induction Vertical	Induction Vertical	Induction Vertical	Induction Vertical	Induction Vertical
Mounting	Vertical	Vertical	Vertical	Vertical	Vertical
Manufacture	General Electric	General Electric	General Electric	General Electric	General Electric
Model	5KS5110AE80208	5KS5110AE80208	5KS5110AE80208	5KS5110AE80208	5KS5110AE80208
Frame	L5011TP24	L5011TP24	L5011TP24	L5011TP24	L5011TP24
Horsepower	400	400	400	400	400
Voltage	460	480	480	460	460
Full Load Amps	512	474	457	512	512
P.F.	74.5	80.5	83.5	74.5	74.5
Nom. Eff.	94.1	94.1	94.1	94.1	94.1
Phases	3	3	3	3	3
Cycles (Hz)	60	60	60	60	60
Speed	885	885	885	885	885
Service Factor	1.15	1.15	1.15	1.15	1.15
Ins. Class	F	F	F	F	F
Inverter Duty	Yes	(Suitable for PWM)	(Suitable for PWM)	Yes	Yes
Heater	115V, 350W	*230V, 350W	*230V, 350W	115V, 350W	115V, 350W
Stator RTD's	Six (6) 100ohm Pt	Six (6) 100ohm Pt	Six (6) 100ohm Pt	Six (6) 100ohm Pt	Six (6) 100ohm Pt
Bearing RTD's	Two (2) 100ohm Pt	Two (2) 100ohm Pt	Two (2) 100ohm Pt	Two (2) 100ohm Pt	Two (2) 100ohm Pt

* The ECWA will replace 230V, 350W heater with 115V, 350W heater.

SECTION 400523.15 - GATE VALVES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient-seated gate valves.
- B. Related Requirements:
 - 1. Section 400551 - Common Work Results for Process Valves: Basic materials and methods related to valves commonly used for process systems.

1.2 REFERENCE STANDARDS

- A. American Society of Mechanical Engineers:
 - 1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings.
 - 2. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through 24 - Metric/Inch Standard.
 - 3. ASME B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300.
- B. ASME B1.20.1 - Pipe Threads, General Purpose (Inch).
- C. ASTM International:
 - 1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
 - 2. ASTM A536 - Standard Specification for Ductile Iron Castings.
 - 3. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
 - 4. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.
 - 5. ASTM D1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
- D. American Water Works Association:
 - 1. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
 - 2. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.
- E. Manufacturers Standardization Society of the Valve and Fittings Industry:
 - 1. MSS SP-70 - Gray Iron Gate Valves, Flanged and Threaded Ends.
 - 2. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves.

1.3 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data:
 - 1. Submit catalog information, indicating materials of construction and compliance with indicated standards.

SECTION 400523.15 - GATE VALVES

- C. Source Quality-Control Submittals: Indicate results of factory tests and inspections.

PART 2 - PRODUCTS

2.1 RESILIENT SEAT GATE VALVES

A. General

1. The design working pressure and test pressure for all valve sizes shall be as described in AWWA C509 and materials conforming to C509. All valves shall be designed to operate vertically in a horizontal pipeline.
2. The valve disc shall be fully encapsulated with a synthetic elastomer and shall seat against a Fusion Bond Epoxy coated surface.
3. Valves for buried applications shall have mechanical joint ends and be restrained by use of a mechanical joint wedge action retainer gland to resist movement.
4. All bolts and nuts, including bonnet assembly and seal plate hold-down, shall be 304 Stainless Steel.
5. Valves for exposed applications shall have flanged ends conforming to ANSI B16.1, Class 125 conforming to ANSI A21.11.
6. Thin walled AWWA C515 valves shall not be allowed.

B. Gate Valve

1. The body, bonnet, seal plate, disc and hub nut shall be ductile iron.
2. Non-rising valve stem, nuts, glands and bushings shall be bronze.
3. Non-rising valve stems shall be 316 stainless steel.
4. Shaft "O"-ring seals shall be synthetic rubber or Buna-N and shall be capable of being replaced under pressure.
5. All internal parts shall be accessible without removing the main body from the pressurized line.

C. Operators

1. Operator shall be suitable for buried or in-plant service. Refer to Section 400551.
2. Operators shall be as specified in AWWA C509 for submerged, buried, or in-plant service as specified.
3. Operators shall be equipped with a 2-inch square ductile iron operating nut and shall be full gasketed and grease packed for buried service. Operating nuts shall turn clockwise to close the valve. A cast arrow showing the direction of valve opening shall be supplied.
4. Exposed manually operated gate valve shall be equipped with ductile iron hand wheels. Gate valves located more than five feet above the operating floor shall be provided with chainwheels, sprockets, and aluminum chain. The chain shall extend to three feet above the operating floor. Refer to Section 400551.

D. Manufacturer:

1. Kennedy Valve Co. Model 8561
2. Mueller Co. Model A-2361-6

SECTION 400523.15 - GATE VALVES

3. Or approved equal.

2.2 SOURCE QUALITY CONTROL

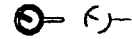
- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Testing: Test gate valves according to AWWA C509.

PART 3 - EXECUTION

3.1 INSTALLATION

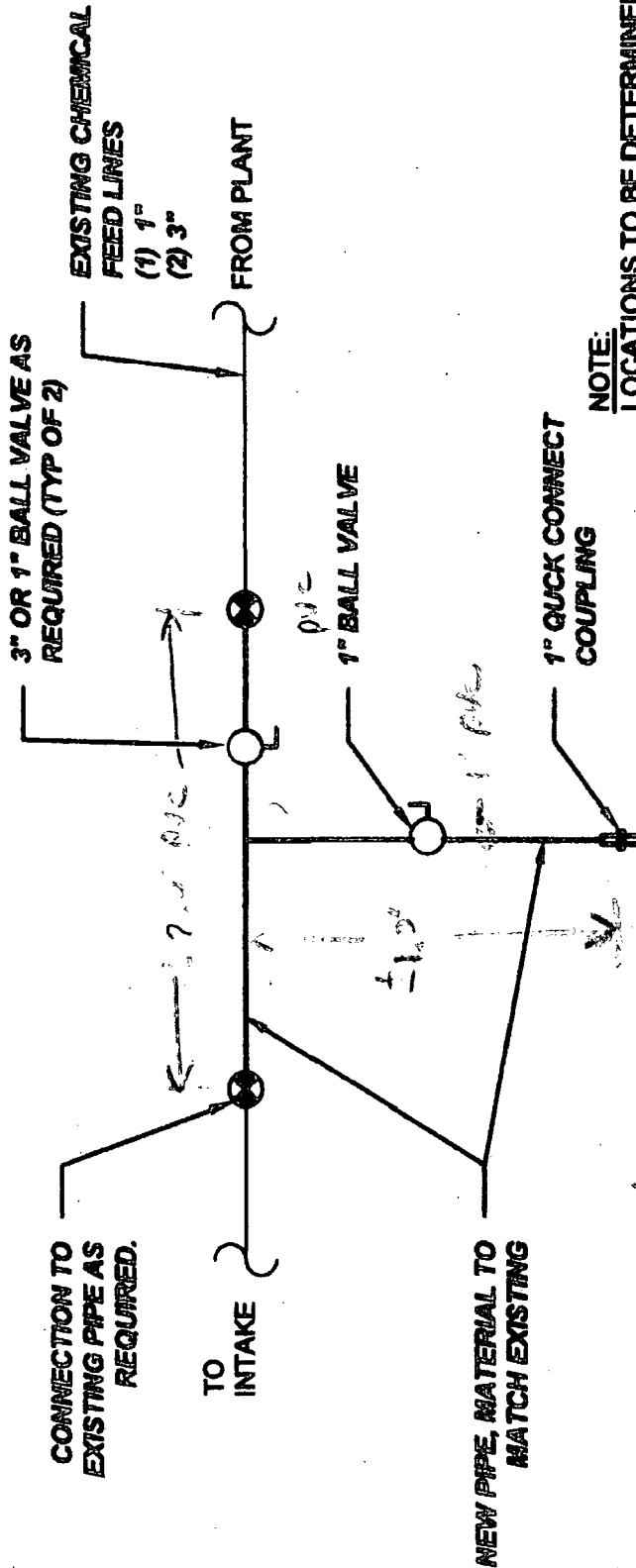
- A. Install according to manufacturer's instructions.
- B. Support valves to prevent undue stresses on piping.

END OF SECTION



PROPOSED ANALOG PRESSURE GAUGE TO BE INSTALLED

EXISTING ANALOG PRESSURE GAUGE TO BE REMOVED



A5 AIR COMPRESSOR CONNECTION DETAIL (TYP OF 3)

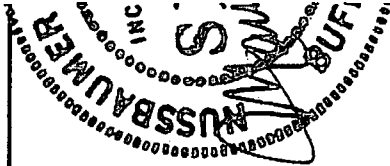
SCALE: NTS

5

6

REFERENCE DRAWING D-501

UNIVERSITY

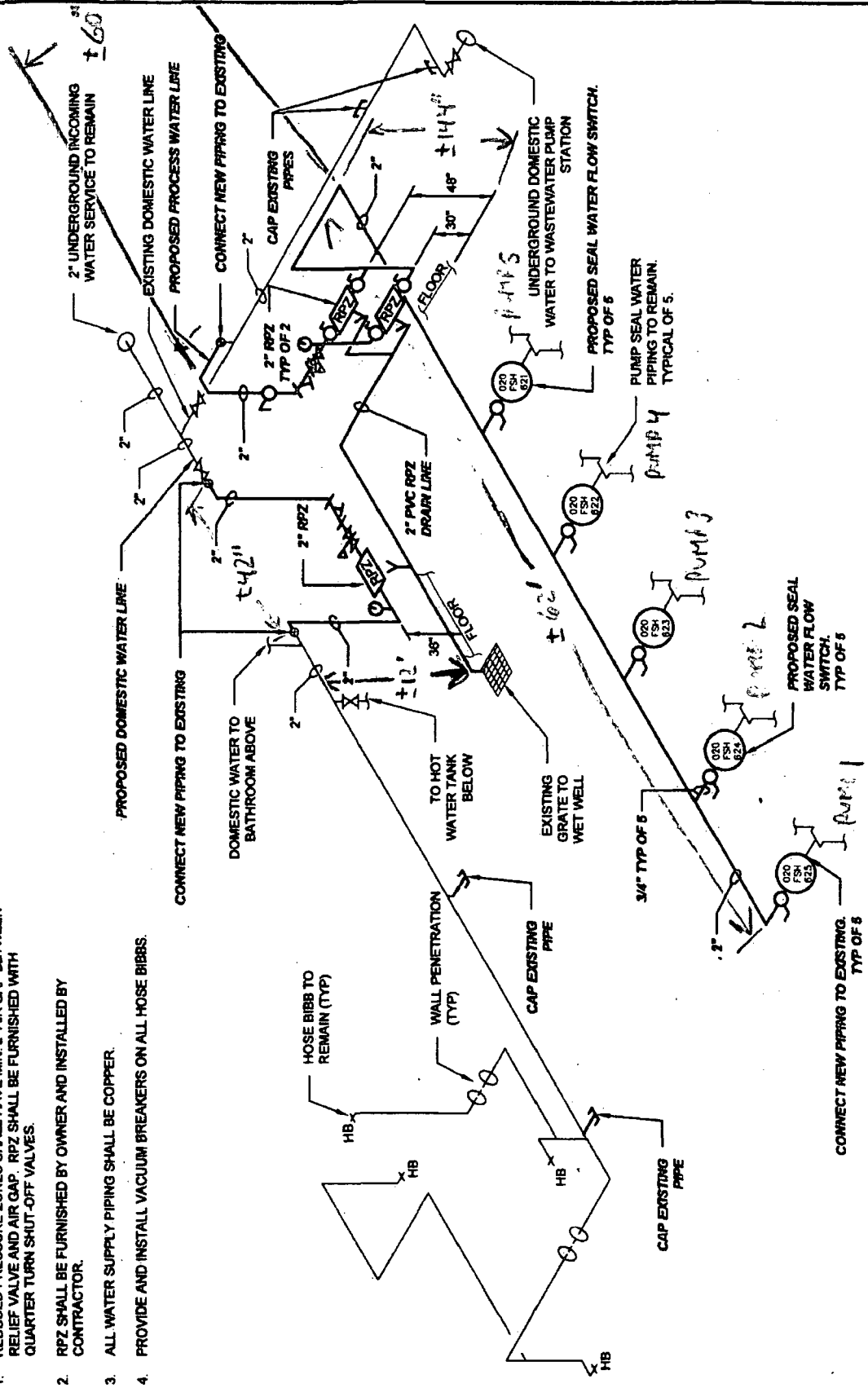


UNAUTHORITARY
ADDITION TO
DRAWING
SECTION 7208
NEW YORK ST

PROJECT NUMBER	
DATE	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
APPROVED BY	
SCALE	
SHEET No.	D

NOTES:

1. REDUCED PRESSURE ZONES SHALL HAVE MIN. 2" AIR GAP BETWEEN RELIEF VALVE AND AIR GAP. RPZ SHALL BE FURNISHED WITH QUARTER TURN SHUT-OFF VALVES.
2. RPZ SHALL BE FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
3. ALL WATER SUPPLY PIPING SHALL BE COPPER.
4. PROVIDE AND INSTALL VACUUM BREAKERS ON ALL HOSE BIBBS.



C4 PROPOSED DOMESTIC AND PROCESS WATER ISOMETRIC DRAWING

SCALE: NOT TO SCALE

SYMBOL SCHEDULE	
SYMBOL	DESCRIPTION
○	PROPOSED COLD WATER SUPPLY PIPE TO BE INSTALLED
○	EXISTING COLD WATER SUPPLY PIPE TO REMAIN
○	EXISTING PLUMBING PIPING TO BE REMOVED

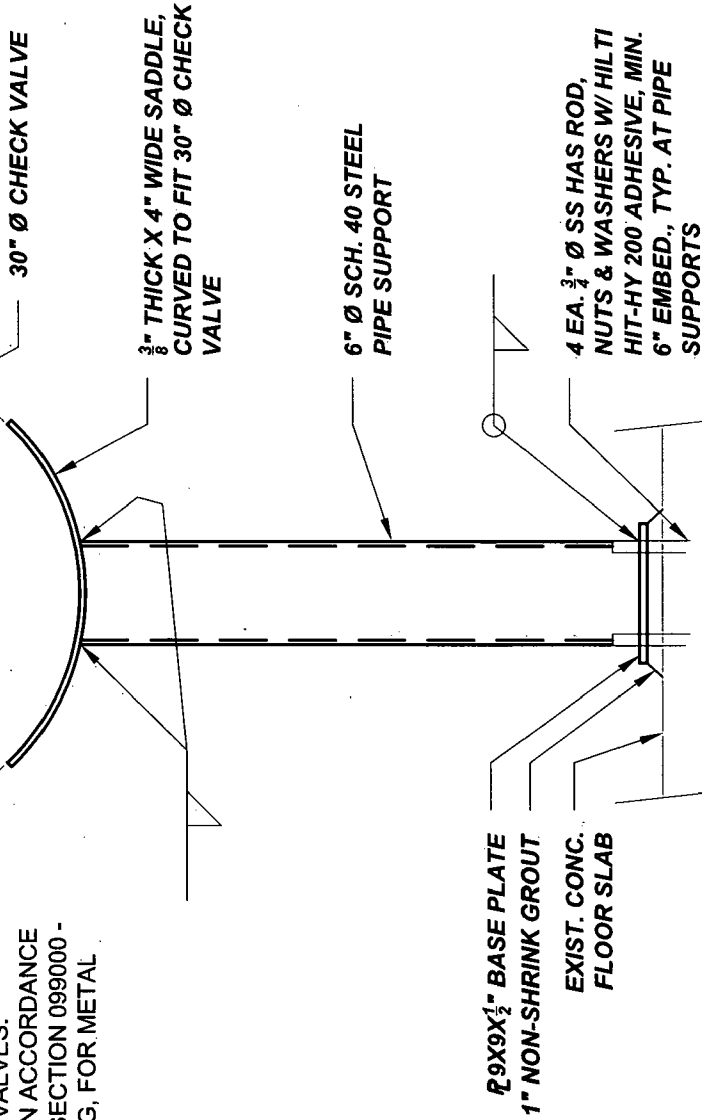
Wassbauer & Clark, Inc.

NCWA STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS

DATE	
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REFERENCE DRAWING D-501

- NOTE:
1. TYPICAL AT TWO LOCATIONS EACH FOR THE FIVE 30" Ø CHECK VALVES.
 2. PAINT PIPE SUPPORT IN ACCORDANCE WITH SPECIFICATION SECTION 099000 - PAINTING AND COATING, FOR METAL SUBSTRATES.



CHECK VALVE SUPPORT DETAIL

SCALE: N.T.S.

A5

Russbamer & Clarke, Inc.
 ENGINEERS AND SURVEYORS

3556 Lake Shore Road, Suite 500 | Buffalo, NY 14219
 (716) 827-8000 | (716) 826-7958 fax
 www.russbamer.com
 Erie | Niagara | Chautauque | Cattaraugus

15J1-0035
CHECK VALVE SUPPORT DETAIL
 Sturgeon Point Raw Water Pump Station Improvements
 Erie County, New York

REFERENCE
 DRAWING
 S-505/A5

#21

Name of Person, Firm or Corporation Submitting Bid:

ERIE COUNTY WATER AUTHORITY
CONTRACT NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO. 201500175

ADDENDUM NO. 2
October 31, 2016

The attention of all Bidders is directed to the following changes to the Contract Documents:

TECHNICAL SPECIFICATION CLARIFICATIONS

1. Specification Section 055000 – METAL FABRICATIONS, Part 1.01.A.3. **CLARIFICATION:** The “Fish bin.” Refers to the screening basket as detailed on Sheet 34 of 49 (D-501) – STRUCTURAL DETAILS.

TECHNICAL SPECIFICATION MODIFICATIONS

1. Specification Section 00800 – SUPPLEMENTARY CONDITIONS, Part SC-4.02. The following drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the Site: **ADD:**

“k. Shop Drawing No. CZ 14364 by Link-Belt FMC Corporation, Titled General Arrangement of Mod & 45A I.D. Water Scrn. 7'-0" x 50'-0" Centers”

A Note on this shop drawing reads “Estimated shipping weight of each screen less steel guides is about 24,100 lbs. Weight of steel guides is about 2,400 lbs per set.”
2. Specification Section 462160 - TRAVELING WATER SCREENS, Part 2.04.K.1, Controls **ADD:** “y. Ultrasonic level transducers (two per screen) and mounting brackets”
3. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 1.03, OPERATING SPECIFICATIONS, Lift: **REPLACE:** “32' above the basement floor with two wraps remaining on drum at lowest hook position.” with the following “31' above the pump room floor elevation with two wraps remaining on drum at lowest hook position.”

4. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 1.03, Speeds: **DELETE** "Hoist: 25/3.9 fpm, two speed" with the following "Hoist: high speed range (18 – 25 fpm)/low speed range (3.9 – 4.5 fpm), two speed"
5. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 2.01.C. Suppliers include: **ADD:** "6. Columbus McKinnon".
6. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 2.03.B. **REPLACE:** "End stops shall be formed of malleable angle iron and provided at all dead end track sections." with the following "End stops shall be provided at all dead end track sections and shall be constructed of structural steel shape and/or plate of adequate size and configuration to resist forces applied when contacted".
7. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 2.06.A.3. **REPLACE:** "Flat cable connectors shall be heat shrinkable, corrosion resistant and flame retardant" with the following "Flat cable connectors shall utilize the manufacturers standard connection fittings and hardware, and shall be corrosion resistant and flame retardant".
8. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 2.06.B.4. **REPLACE:** "Trolley and hoist functions shall be controlled by separate magnetic contactors." with the following "Hoist functions shall be controlled by separate magnetic contactors".
9. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 2.06.C.1. **REPLACE:** "A NEMA 4, Hubbell pendant station will be provided with a separate pushbutton for each direction." with the following "A NEMA 4, pendant station will be provided with a separate pushbutton for each direction."
10. Specification Section 146300 - TOP RUNNING DOUBLE GIRDER BRIDGE CRANE, Part 2.06.D **REPLACE:**

D. Radio Controls

1. 2-step pushbuttons and emergency-Stop pushbutton
2. Robust plastic housing, protection class IP65 with comfortable carrying hand strap.
3. Rechargeable Li-ion batteries, providing 16 hours of operating time at 50% Effective Duty and LED indication of battery and operating status.
4. Cranes, solo hoists, chain hoists with motorized travel motions.
5. Internal antenna in the receiver and in the transmitter, VHF (400-465 MHz) and UHF (800-930 MHz) bandwidths.
6. General Technical Specifications
 - a. Transmitter protection: NEMA Type 4 (IP65)
 - b. Receiver protection: NEMA Type 4 (IP65)
 - c. Approvals: CSA, c/us
 - d. Operating Frequency: 48
 - e. Operating Temperature: -4°F to 158°F (-20 to 70°C)
7. Provide two radio controls with chargers.

With the following:

D. Radio Controls

1. 2-step pushbuttons and emergency-Stop pushbutton
2. Robust plastic housing, protection class IP65 with comfortable carrying hand strap.
3. Rechargeable Li-ion batteries, providing 16 hours of operating time at 50% Effective Duty and LED indication of battery and operating status.
4. Internal antenna in the receiver and in the transmitter, operating at a frequency that will not interfere with any other electrical equipment within the facility.
5. General Technical Specifications
 - a. Transmitter protection: NEMA Type 4 (IP65)
 - b. Receiver protection: NEMA Type 4 (IP65)
 - c. Approvals: UL, CSA
 - d. Operating Temperature: -4°F to 158°F (-20 to 70°C)
6. Provide two radio controls with chargers.

11. Specification Section 400567.36 – PRESSURE-REGULATING VALVES, Part 3.07.A.

REPLACE:

A. Pressure reducing valve schedule.

1. Raw Water Screen spray water.
2. Number: 2.
3. Size: 4-inch.
4. Connections: Flanged.
5. Flow Rate: 250 to 300 gpm.
6. Upstream Pressure: 100 to 150 psi.
7. Required Downstream Pressure: 80 to 100 psi.

With the following:

A. Pressure reducing valve schedule.

1. Raw Water Screen spray water.
 - a. Number: 2.
 - b. Size: 4-inch.
 - c. Connections: Flanged.
 - d. Flow Rate: 250 to 300 gpm.
 - e. Upstream Pressure: 100 to 150 psi.
 - f. Required Downstream Pressure: 80 to 100 psi.
2. Domestic and Process Water.
 - a. Number: 2.
 - b. Size: 2-inch.
 - c. Connections: Threaded
 - d. Flow Rate: 5 to 25 gpm.
 - e. Upstream Pressure: 100 to 150 psi.
 - f. Required Downstream Pressure: 60 to 80 psi.

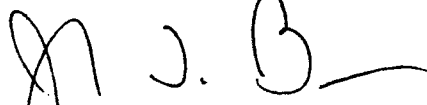
DRAWING CLARIFICATIONS

1. Sheet 33 of 49 (D-201) – PROCESS ELEVATION VIEW, Detail A4, Proposed Screen Assembly Section View **CLARIFICATION:** The material used to fill the pockets in the concrete slab underneath the sluice gates shall be MasterFlow 928, High precision mineral-aggregate grout with the following extended working time as manufactured by BASF or approved equal. Method and Material shall be approved by sluice gate manufacturer to provide flush bottom closure.
2. Sheet 34 of 49 (D-501) – PROCESS DETAILS, Detail C4, Proposed Domestic and Process Water Isometric Drawing **CLARIFICATION:** The flow switches called out in this detail shall be SERIES V10 Flotect® Mini-Size Flow Switch as manufactured by Dwyer Instruments, Inc. or approved equal.
3. Sheet 34 of 49 (D-501) – PROCESS DETAILS, Detail C4, Proposed Domestic and Process Water Isometric Drawing **CLARIFICATION:** The vacuum breakers required in this detail shall be Model BFP-9 hose bib vacuum breakers as manufactured by Zurn or approved equal.

SPECIAL NOTICE

This Addendum No. 2, including all attachments, shall be inserted into the Specifications and submitted with the Bid, and shall be signed by the Bidder in the space provided below.

ERIE COUNTY WATER AUTHORITY



Joseph Burns
Secretary to the Authority

CONSULTING ENGINEER:

Nussbaumer & Clarke, Inc.
Suite 500
3556 Lake Shore Road
Buffalo, New York 14219
716-827-8000
716-826-7958 fax

Signature of person, firm, or corporation making bid:

Signature

Title

SEAL (If bid by Corporation)

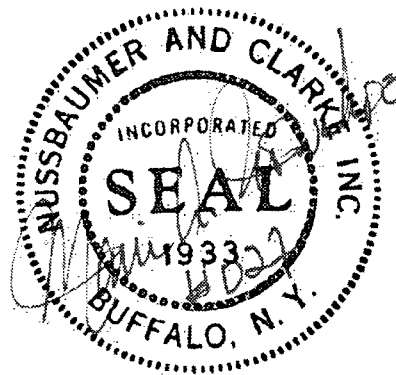
**ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK**

**CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS**

ECWA PROJECT NO: 201500175

SEPTEMBER 2016

**This Project Manual and Contract Drawings were prepared under the direct supervision of
a Professional Engineer by: Nussbaumer & Clarke, Inc.**



**ERIE COUNTY WATER AUTHORITY
295 Main Street, Room 350
Buffalo, New York 14203**

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

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ERIE COUNTY WATER AUTHORITY
295 MAIN STREET, ROOM 350
BUFFALO, NEW YORK 14203

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

NOTICE TO BIDDERS

The Erie County Water Authority will receive separate, sealed bids for the furnishing of all labor, plant, tools, equipment and specified materials, etc. for ERIE COUNTY WATER AUTHORITY, STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS, TOWN OF EVANS. The Work consists of a single contract for the installation of traveling water screens, sluice gates, pump discharge valves, building addition and improvements, and electrical improvements.

Bids will be received by the Erie County Water Authority until 11:00 a.m. prevailing time, on Tuesday, November 1, 2016 at the Cashier's Office of the Authority, 295 Main Street, Room 350, Buffalo, New York 14203, and then at that time and place will be publicly opened and read.

All bids being mailed (including FedEx, UPS, Priority Mail, etc.) or hand-delivered to the Erie County Water Authority shall be directed to the "CASHIER'S OFFICE" at the address listed above in a sealed envelope and be clearly marked on the outside of the mailing or hand-delivered envelope "BID ENCLOSED-ECWA, Sturgeon Point Raw Water Pump Station Improvements, Town of Evans". Failure to follow the above instructions could result in rejection of the bid.

Beginning at 9:00 a.m., on Tuesday, October 4, 2016, the Instruction to Bidders, Form of Bid and form of Contract, Specifications, and Security Bonds may be examined at the above address and may be obtained by writing the Cashier's Office at the above address or calling (716) 849-8484, between the hours of 9:00 a.m. and 5:00 p.m. upon payment of a deposit of Fifty Dollars (\$50.00). Check for documents shall be made payable to Erie County Water Authority.

Contract Documents are also available by mail through the following procedure. The ENGINEER will mail the Contract Documents to those wishing to obtain a set upon receipt of the document deposit described above plus a non-refundable mailing and handling charge of twenty five dollars (\$25.00) per set. The mailing date will be considered the bidder's date of receipt. Partial sets of documents will not be available. The \$50.00 deposit check for mailed documents shall be sent to the ENGINEER with the \$25.00 mailing and handling check. The mailing and handling check (\$25.00) shall be made payable to the ENGINEER. Deposits for deposit checks will be refunded to Bidders who return the documents within seven (7) days after the Bid Opening. Checks for mailing costs will not be refunded.

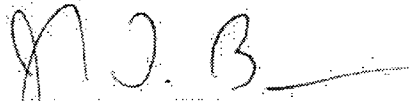
A pre-bid conference will be held at 10:00 a.m., prevailing time, on Wednesday, October 19, 2016, at the Sturgeon Point Water Treatment Plant, 722 Sturgeon Point Road, Derby, NY 14047. Attendance at the pre-bid meeting is recommended but is not mandatory.

Each bid shall be accompanied by a certified check or bid bond in the amount of five percent (5%) of the amount of the bid.

In accordance with State Finance Law §§139-j and 139-k, all questions about meaning or intent of the bidding documents shall be submitted to the designated contact person in writing. The designated contact is listed below.

The Erie County Water Authority reserves the right to reject any and all bids or to accept any bid deemed to be for the best interest of the Water Authority even though the proposal chosen may result in the award of the contract to a bidder whose bid is not mathematically lowest.

ERIE COUNTY WATER AUTHORITY


JOSEPH T. BURNS
Secretary to the Authority

Engineer/Designated Contact:

Michael Chirico, PE
Corporate Associate
Nussbaumer & Clarke, Inc.
3556 Lake Shore Road
Suite 500
Buffalo, NY 14219
(716) 827-8000 ext. 209
mchirico@nussclarke.com

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT No.: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT No.: 201500175

SECTION 00200

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18. Modification or Withdrawal of Bid
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20. Disqualification of Bidders
21. Bids to Remain Subject to Acceptance
22. Award of Contract
23. Contract Securities
24. Contractor's Insurance
25. Signing of Agreement
26. Notice to Proceed
27. Partnering - Not Used
28. Sales and Use Taxes
29. Additional Requirements

ARTICLE 1 - DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.
- 1.02 Additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.
- A. Bidder: The individual or entity who submits a Bid directly to OWNER.
 - B. Issuing Office: The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered.
 - C. Successful Bidder: The Bidder submitting a responsive Bid to whom OWNER (on the basis of OWNER'S evaluation as hereinafter provided) makes an award. Also known as CONTRACTOR.
 - D. ENGINEER: As defined in the Agreement, Section 00500, under Article 2.

ARTICLE 2 - BIDS RECEIVED

- 2.01 Refer to Notice to Bidders for information on receipt of Bids.

ARTICLE 3 - LOCATION AND SCOPE OF WORK

- 3.01 Refer to Section 011000 of the General Requirements for the location and scope of the Work.

ARTICLE 4 - COPIES OF BIDDING DOCUMENTS

- 4.01 Refer to Notice to Bidders for information on examination and procurement of Bidding Documents.
- 4.02 The Issuing Office is the Cashier Office of the Erie County Water Authority, 295 Main Street, Room 350, Buffalo, New York 14203.
- 4.03 Complete sets of Bidding Documents must be used in preparing Bids; neither OWNER, nor ENGINEER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 4.04 OWNER and ENGINEER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant permission for any other use.

ARTICLE 5 - QUALIFICATIONS OF BIDDERS

- 5.01 Bidders shall be experienced in the kind of Work to be performed, shall have the necessary equipment therefore, and shall possess sufficient capital to properly execute the Work within the time allowed. Bids received from Bidders who have previously failed to complete work within the time required, or who have previously performed similar work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show that Bidder has the necessary ability, plant and equipment to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the time specified. A Bid may be rejected if Bidder is already obligated for the performance of other work which would delay the commencement, prosecution or completion of the Work.
- 5.02 To demonstrate qualifications to perform the Work, Bidder shall complete and submit with its Bid the Bidder Qualifications Statement which is bound in the Project Manual. Bidders may be asked to furnish additional data to demonstrate their qualifications.
- 5.03 Bidders shall be qualified to do business in the state where the Project is located or covenant to obtain such qualification prior to signing the Agreement.

ARTICLE 6 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 6.01 Subsurface and Physical Conditions
- A. The Supplementary Conditions identify:
1. Those reports of explorations and tests of subsurface conditions at or contiguous to the Site which have been utilized by ENGINEER in preparation of the Bidding Documents.
 2. Those drawings of physical conditions in or relating to existing surface and subsurface structures (except underground facilities) which are at or contiguous to the Site that have been utilized by ENGINEER in preparation of the Bidding Documents.
- B. Copies of the reports and drawings referenced in the Supplementary Conditions will be made available by ENGINEER to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in paragraph 4.02 of the General Conditions has been identified and established in paragraph SC-4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion drawn from any "technical data" or any other data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings.

6.02 Underground Facilities - Physical Conditions

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to OWNER and ENGINEER by owners of such Underground Facilities, including OWNER, or others.

6.03 Hazardous Environmental Condition

- A. Refer to Appendix F for a report prepared by Aurora Environmental LLC dated October 7, 2015 regarding a pre-renovation survey for asbestos and lead paint.
- B. The existing exhaust vents for the gas fired unit heater are asbestos cement pipe.

6.04 Provisions concerning responsibilities for the adequacy of data, if any, furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unforeseen conditions appear in paragraphs 4.02, 4.03 and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Bidding Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the Scope of Work appear in paragraph 4.06 of the General Conditions.

6.05 On request, OWNER will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests and studies as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former conditions upon completion of such explorations, investigations, tests and studies.

6.06 On request, OWNER will conduct a Site visit during OWNER'S normal business hours.

6.07 Reference is made to the Supplementary Conditions for identification of the general nature of other work that is to be performed at the Site by OWNER or others (such as utilities and other prime contractors) that relates to the Work for which a Bid is to be submitted. On request, and if available, OWNER will provide to Bidder, for examination, access to or copies of the contract documents for such other work.

6.08 It is the responsibility of Bidder, before submitting a Bid to:

- A. Examine and carefully study the Bidding Documents, including any Addenda and the other related data identified in the Bidding Documents;
- B. Visit the Site and become familiar with and satisfy Bidder as to the general, local and Site conditions that may affect cost, progress and performance of the Work;
- C. Become familiar with and satisfy Bidder as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work;
- D. Carefully study all reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and to carefully study all reports and drawings of a Hazardous Environmental Condition identified at the Site, if any, which have been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions;
- E. Obtain and carefully study (or assume responsibility for having done so) all examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder, including any specific means, methods, techniques, sequences and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;
- F. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for the performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;
- G. Become aware of the general nature of work (if any) to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents;
- H. Correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies and data with the Bidding Documents;
- I. Promptly give ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by ENGINEER is acceptable to Bidder; and

- J. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 6.09 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 6, that without exception the Bid is premised upon performing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences or procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by ENGINEER are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing the Work.

ARTICLE 7 - PRE-BID CONFERENCE

- 7.01 A pre-bid conference will be held if so indicated in the Notice to Bidders, and will be as follows. Representatives of the OWNER and ENGINEER will be present to discuss the Project. Bidders are encouraged to attend and participate at the conference. ENGINEER will transmit to all prospective Bidders of record such Addenda as ENGINEER considers necessary in response to questions raised at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 8 - SITE AND OTHER AREAS

- 8.01 The Site is identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment, to be incorporated into the Work are to be obtained and paid for by CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by OWNER unless otherwise provided in the Bidding Documents.

ARTICLE 9 - INTERPRETATIONS AND ADDENDA

- 9.01 All questions about the meaning or intent of the Bidding Documents shall be submitted to ENGINEER in writing. In order to receive consideration, questions must be received by ENGINEER at least ten (10) days prior to the date for the opening of Bids. Interpretations, clarifications, and/or supplemental instructions considered necessary by ENGINEER in response to such questions will be issued by Addenda, mailed either by Registered or Certified mail, with return receipt requested, to all parties recorded by ENGINEER as having received the Bidding Documents, for receipt not later than three (3) days prior to the date for the opening of Bids. Failure of any Bidder to receive such Addendum or interpretation shall not relieve any bidder from any obligation under his bid submitted. All Addenda so issued shall become part of the Contract Documents. All Addenda must be submitted with the bid proposal and be properly signed by the Bidder

as part of the Bid Documents. Only questions answered by Addenda will be binding. The OWNER will not be responsible for any other explanations or interpretation of such documents which anyone presumes to make on behalf of the OWNER before expiration of the time set for the receipt of Bids. No interpretation of the meaning of the plans, specifications or other Contract Documents will be made to any bidder orally. Oral and other interpretations or clarifications will be without legal effect.

- 9.02 Addenda may also be issued to clarify, correct or change the Bidding Documents as deemed advisable by OWNER or ENGINEER. Such Addenda, if any, will be issued in the manner and within the time period stated in paragraph 9.01.

ARTICLE 10 - BID SECURITY

- 10.01 A Bid must be accompanied by Bid security made payable to the OWNER in the amount of five percent of Bidder's maximum Bid price and in the form of certified check or Bid Bond.
- 10.02 Bid Bond shall be on the form bound in the Project Manual. Bid Bond shall be issued by a surety meeting the requirements of paragraphs 5.01 and 5.02 of the General Conditions. The Bid Bond must contain original signatures in ink. Pencil, stamped, thermal faxed, Xeroxed, or any other copies of the signature shall be grounds for voiding the Bid.
- 10.03 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to sign and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, OWNER may annul the Notice of Award and the Bid security of that Bidder will be forfeited to the OWNER as liquidated damages for such failure.
- 10.04 The Bid security of the three lowest bidders may be retained by OWNER until the earlier of the seventh day after the Effective Date of the Agreement or the forty-first day after the Bid opening whereupon the Bid security furnished by such Bidders will be returned. The Bid security of Bidders whom OWNER believes do not have a reasonable chance of receiving an award will be returned within seven days of the Bid opening.

ARTICLE 11 - CONTRACT TIMES

- 11.01 The number of days within which the Work is to be substantially completed and also completed and ready for final payment (the Contract Times) are set forth in the Agreement.

ARTICLE 12 - LIQUIDATED AND SPECIAL DAMAGES

12.01 Provisions for liquidated and special damages, if any, are set forth in the Agreement.

ARTICLE 13 - SUBSTITUTE AND "OR EQUAL" ITEMS

- 13.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedure for submittal of any such application by CONTRACTOR and consideration by ENGINEER is set forth in the General Conditions which may be supplemented in the General Requirements.
- 13.02 Refer to Section 013310 of the General Requirements for the period of time after the Effective Date of the Agreement during which the ENGINEER will accept applications for substitute or "or-equal" items of material or equipment.

ARTICLE 14 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 14.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals or entities to be submitted to OWNER in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening submit to OWNER a list of all such Subcontractors, Suppliers, other individuals or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualifications for each such Subcontractor, Supplier, individual or entity if requested by OWNER. If OWNER or ENGINEER, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual or entity, OWNER may, before the Notice of Award is given, request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price.
- 14.02 If apparent Successful Bidder declines to make any such substitution, OWNER may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other individuals or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual or entity so listed and against which OWNER or ENGINEER makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER subject to revocation of such acceptance after the Effective Date of the Agreement as provided in paragraph 6.06 of the General Conditions.

14.03 CONTRACTOR shall not be required to employ any Subcontractor, Supplier, individual or entity against whom CONTRACTOR has reasonable objection.

ARTICLE 15 - PREPARATION OF BID

15.01 A Bid must be made on the Bid form bound in the Project Manual. The Bid form shall not be separated from the Project Manual nor shall it be altered in any way.

15.02 All blanks in the Bid Form shall be completed by printing in black ink or by typewriter. A Bid price shall be indicated in both words and numbers for each Bid item listed therein or the words "No Bid", or "Not Applicable" entered. In case of discrepancy between the words and the numerals, the words shall govern. Ditto marks are not considered writing or printing and shall not be used.

15.03 A Bid shall be executed as stated below.

- A. A Bid by an individual shall show the Bidder's name and official address.
- B. A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title shall appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.
- C. A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid form. The official address of the joint venture shall be shown below the signature.
- D. A Bid by a corporation shall be executed in the corporate name by an officer of the corporation and shall be accompanied by a certified copy of a resolution of the board of directors authorizing the person signing the Bid to do so on behalf of the corporation. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The state of incorporation and the official corporate address shall be shown below the signature.
- E. A Bid by a limited liability company shall be executed in the name of the firm and signed by a member accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown below the signature.
- F. All names shall be typed or printed in black ink below the signature.
- G. Evidence of authority to conduct business as an out-of-state corporation in the state where the Work is to be performed shall be provided, if applicable.

15.04 The Bid shall contain an acknowledgment of the receipt of all Addenda in the space provided on the Bid form.

- 15.05 The address and telephone number for communications regarding the Bid shall be shown.
- 15.06 In addition to the Bid Form, the following listed documents, which are bound in the Project Manual in Section 00430 - Bid Form Supplements and Section 00450 – Bidder’s Qualification Statement, shall be submitted with the Bid. Each document shall be executed in the manner described in paragraph 15.03 unless another manner is indicated.
- A. Bid Security Form.
 - B. Section 2875 of the Public Authorities Law.
 - C. Section 2876 of the Public Authorities Law.
 - D. Section 2878 of the Public Authorities Law, Non-collusive Bidding Certification.
 - E. Section 139 of State Finance Law.
 - F. Bidder’s Qualification Statement, including Attachments A, B, C and D and Bidder’s “Experience in The Installation of Tapping Sleeves & Valves on Prestressed Concrete Cylinder Pipe”, if applicable.
 - G. All Addenda.

ARTICLE 16 - BASIS OF BIDS; COMPARISON OF BIDS

16.01 Lump Sum and Unit Price

- A. Bidder shall submit its Bid on the basis of each lump sum item and unit price item as set forth in the Bid Form. For each unit price item on the Bid form, Bidder shall enter the unit price Bid, and shall enter the computation of the respective quantity times the Bidder’s unit price for that item. Bidder shall compute and enter in the space provided on the Bid form, the total of all lump sum items and the total of the products of quantity and unit price Bid for each unit price item.
- B. For determination of the apparent low Bidder, Bids will be evaluated on the basis of the total of all lump sum items and the total of the products of the estimated quantity of each item and unit price Bid for that item.
- C. The quantities for the unit price items are unpredictable and the ENGINEER has inserted certain quantities in the Bid Form to be used solely for purpose of comparison bids.
- D. Fixed minimum unit prices may have been established for some of the items in the Bid. The prices represent the minimum amounts which will be paid the CONTRACTOR for these items. If in the opinion of the Bidder these prices do not

reflect the actual value of the work involved the Bidder may void the given fixed minimum unit price for that specific item and enter a higher unit price in the spaces provided in the Bid Sheets.

- 16.02 Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

ARTICLE 17 - SUBMITTAL OF BID

- 17.01 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Notice to Bidders. The entire Project Manual must be submitted with all proper forms completed and signed as required.
- 17.02 Bid shall be enclosed in an opaque sealed envelope plainly marked on the outside with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) the name and address of the Bidder and its license or registration number, if applicable. Bid shall be accompanied by Bid security and other required documents.
- 17.03 All bids being mailed (including FedEx, UPS, Priority Mail, etc.) or hand-delivered to the Erie County Water Authority shall follow the procedure as defined in Section 00100, Notice To Bidders.

ARTICLE 18 - MODIFICATION OR WITHDRAWAL OF BID

- 18.01 Withdrawal Prior to Bid Opening:
- A. A Bid may be withdrawn by an appropriate document duly executed, in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time fixed for the opening of Bids. Upon receipt of such written notice, the unopened Bid will be returned to the Bidder.
- 18.02 Modification Prior to Bid Opening:
- A. If a Bidder wishes to modify its Bid, Bidder must withdraw its initial Bid in the manner specified in paragraph 18.01.A and submit a new Bid.
- 18.03 No Bids may be withdrawn after the time set for the Bid Opening.

ARTICLE 19 - OPENING OF BIDS

- 19.01 Bids will be opened at the time and place where Bids are to be submitted and, unless obviously non-responsive, read aloud publicly. An abstract of the Bids will be made available to Bidders after the opening.
- 19.02 Bids received by mail or otherwise after the date and time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.
- 19.03 Bid results are available on the Erie County Water Authority website, www.ecwa.org (under Doing Business tab, select option Business Opportunities). No bid results will be given over the telephone.

ARTICLE 20 - DISQUALIFICATION OF BIDDERS

- 20.01 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

ARTICLE 21 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 21.01 All Bids shall remain subject to acceptance for forty five days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.
- 21.02 In the event that the OWNER requires more than 45 calendar days after the actual date of the Bid Opening to award the contract, Bidders shall, when requested, provide to ENGINEER a written extension of time for OWNER to award the contract. Bidders shall also provide, to ENGINEER, written Consent of Surety for extension of the bid bond.
- 21.03 In the event that the OWNER requires more than 45 calendar days after the actual date of the Bid Opening to award the contract, and the lowest qualified bidder does not grant an extension of time for the OWNER to award the contract, the OWNER reserves the right to award to the second lowest qualified bidder.

ARTICLE 22 - AWARD OF CONTRACT

- 22.01 OWNER reserves the right to reject any or all Bids, including without limitation the right to reject any or all nonconforming, non-responsive or conditional Bids. Bids may be rejected if they show any omissions, alterations of form, additions not called for, conditional or alternate bids other than are provided for in the Bid Form, bids containing escalation clauses or irregularities of any kind. OWNER further reserves the right to

reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to be non-responsible. OWNER also reserves the right to waive any informality not involving price, time or changes in the Work, if it is deemed to be in the best interest of the OWNER. The Bidder will not be allowed to take advantage of any error or omission.

- 22.02 OWNER reserves the right to reject any Bid not accompanied by specified documentation and Bid security. In the event that OWNER requires more than 45 calendar days after the actual Bid opening date to award the contract, Bidders shall provide to ENGINEER written Consent of Surety of the Bid Bond.
- 22.03 OWNER reserves the right to reject any Bid that, in its sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.
- 22.04 In evaluating Bidders, OWNER will consider their qualifications whether or not their Bids comply with the prescribed requirements, the alternatives, if any, the lump sum and unit prices, and other data as may be requested in the Bid Form or prior to the Notice of Award.
- 22.05 OWNER may consider the qualifications and experience of Subcontractors, Suppliers and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 22.06 OWNER may conduct such investigations as OWNER deems necessary to establish the responsibility, qualifications and financial ability of the Bidders to perform the Work in accordance with the Contract Documents. OWNER reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to OWNER'S satisfaction.
- 22.07 OWNER reserves the right to accept any Bid deemed to be in its best interests even though the Bid chosen may result in the award of the Contract to a Bidder whose Bid is not, on a mathematical basis alone, the low Bid.
- 22.08 The OWNER may elect not to award a contract at this time due to budgetary or other considerations. OWNER reserves the right to reject any or all proposals and to re-bid the contract if the OWNER deems it in the public interest to do so.
- 22.09 Contracts shall be awarded only pursuant to resolution.
- 22.10 OWNER reserves the right to reject any bids from Bidders who are in arrears to, or in litigation with, the Erie County Water Authority or the County of Erie upon any debt or contract, or in default as surety or otherwise upon any obligation of the Erie County Water Authority or the County of Erie.

ARTICLE 23 - CONTRACT SECURITIES

- 23.01 Performance Bond shall be in the form of Engineers Joint Contract Documents Committee (EJCDC) "Construction Performance Bond", 1910-28-A. Payment Bond

shall be in the form of EJCDC "Construction Payment Bond", 1910-28-B. The amounts of and other requirements for Performance and Payment Bonds are stated in paragraph 5.01 of the General Conditions. The requirements for delivery of Bonds are stated in paragraph 2.01 of the General Conditions. Additional requirements may be stated in the Supplementary Conditions.

- 23.02 Successful Bidder shall within five days from the date of the Notice of Award deliver to OWNER, for OWNER'S review and approval, the Performance Bond and the Payment Bond CONTRACTOR proposes to furnish at the time of the execution of the Agreement.

ARTICLE 24 – CONTRACTOR'S INSURANCE

- 24.01 The requirements for CONTRACTOR'S insurance and delivery of insurance certificates are stated in Article 5 of the General Conditions and in the Supplementary Conditions.

ARTICLE 25 - SIGNING OF AGREEMENT

- 25.01 When OWNER gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents, which are identified in the Agreement as attached thereto. Within five days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to OWNER.

ARTICLE 26 - NOTICE TO PROCEED

- 26.01 Issuance of the Notice to Proceed shall be as stated in Article 2 of the General Conditions.

ARTICLE 27 - PARTNERING (NOT USED)

ARTICLE 28 - SALES AND USE TAXES

- 28.01 Refer to Supplementary Conditions paragraph SC-6.10 for information on OWNER'S exemption from sales and use taxes on materials and equipment to be incorporated into the Work. Do not include said taxes in Bid.

ARTICLE 29 - ADDITIONAL REQUIREMENTS

- 29.01 Refer to Supplementary Conditions Paragraph SC-18.03 for information on OWNER'S Women and Minority Business Enterprise requirements.

END OF SECTION

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

SECTION 00320

GEOTECHNICAL DATA

ARTICLE 1 - GENERAL

- 1.01 Subsurface soil investigations have been made and the results are available as defined in Section 00800, Supplementary Conditions.
- 1.02 The subsurface investigation reports were prepared by Empire Geo Services, Inc.; and Buck, Siefert and Jost and are provided as a reference source for CONTRACTORS in the preparation of Bids and in the performance of their work. These investigations are for examination by Bidders but are not a part of the Contract Documents.
- 1.03 Bidder is responsible for any conclusions drawn from soil investigation data. If he prefers not to assume such risk, he is under obligation to employ his own experts to analyze available information. Bidder is responsible for any consequences of acting on conclusions obtained.
- 1.04 OWNER does not guarantee continuity of conditions indicated at soil investigation locations.

END OF SECTION

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

SECTION 00360

PERMIT APPLICATIONS

ARTICLE 1 - GENERAL

1.01 CONTRACTOR shall apply for and is responsible for complying with all requirements of the following permits.

1. None Required.

END OF SECTION

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

(This Bid Form shall not be detached from the Project Manual. The entire Project Manual shall be returned with the executed Bid.)

SECTION 00410

BID FORMS

BID FOR:

Erie County Water Authority
Contract No: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS
Project No. 201500175

BID TO:

Erie County Water Authority
295 Main Street, Room 350
Buffalo, New York 14203

BID FROM:

STC Construction, Inc.

(Print or Type Name of Bidder)

(/A Corporation/A Partnership/A Limited Liability Company/A
Individual/A Joint Venture/[Bidder to strike out inapplicable terms.]

Gentlemen:

- 1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the price(s) and within the times indicated in this Bid and in accordance with the Bidding Documents.

**ERIE COUNTY WATER AUTHORITY
 CONTRACT NO: NC-34
 STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS**

2.01 Bidder accepts all of the terms and conditions of the Notice to Bidders and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain open subject to acceptance for the time period set forth in the Instruction to Bidders. Bidder will sign the Agreement and will furnish the required contract security, and other required documents within the time periods set forth in the Bidding Documents.

3.01 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, if any, and the following Addenda receipt of all of which is hereby acknowledged.

<u>Addendum No.</u>	<u>Date Received</u>	<u>Addendum No.</u>	<u>Date Received</u>
<u>1</u>	<u>10/25/16</u>	<u> </u>	<u> </u>
<u>2</u>	<u>10/31/16</u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>	<u> </u>

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance for the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition identified at the Site, if any, which have been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may effect cost, progress or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques,

**ERIE COUNTY WATER AUTHORITY
CONTRACT NO: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS**

sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

- F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance of the Work at the price(s) and within the times and in accordance with the other terms and conditions of the Bidding Documents.
 - G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.
 - H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents and all additional examinations, investigations, explorations, tests, studies and data with the Bidding Documents.
 - I. Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to Bidder.
 - J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
 - K. The quantities for the unit price items are unpredictable and the ENGINEER has inserted certain quantities in the proposal to be used solely for purpose of comparison of bids.
 - L. Fixed minimum unit prices may have been established for some of the items in the Bid. The prices represent the minimum amounts, which will be paid the CONTRACTOR for these items. The Bidder shall include a price not less than the stated minimum. If in the opinion of the Bidder these prices do not reflect the actual value of the work involved, the Bidder may void the given fixed minimum unit price for that specific item and enter a higher unit price in the spaces provided in the Bid Form sheets. Bidder's Proposals received which include a unit price less than the stated minimum shall be adjusted to meet the fixed minimum unit price.
- 4.01 Bidder further represents that this Bid is genuine and is not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER; and that no person or persons acting in any official capacity for the OWNER are directly or indirectly interested in this Bid, or in any portion of the profit thereof.

ERIE COUNTY WATER AUTHORITY
CONTRACT NO: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS

5.01 Bidder will complete the Work in accordance with the Contract Documents for:

Item 1 - Raw Water Pump Station Improvements,
the lump sum of

Three Million One Hundred Sixty Two Thousand
Five Hundred Six Dollars

and No Cents
(~~\$ 1,67,506~~) Lump Sum

L.S. \$ 3,162,506.-

Item 2 - Miscellaneous Contingency Allowance,
the lump sum of

Two Hundred and Fifty Thousand Dollars

and No Cents
(\$ 250,000.00) Lump Sum

L.S. \$ 250,000.00

Item 3 - Door Access Contingency Allowance,
the lump sum of

Fifty Thousand Dollars

and No Cents
(\$ 50,000.00) Lump Sum

L.S. \$ 50,000.00

Item 4 - SCADA Contingency Allowance,
the lump sum of

Fifty Thousand Dollars

and No Cents
(\$ 50,000.00) Lump Sum

L.S. \$ 50,000.00

TOTAL BID AMOUNT (This total is for convenience in
comparing Bids and is not an official part of this Bid.)

3,351,2506
(Figures)

Three Million Five Hundred Twelve Thousand Five
Hundred Six Dollars and No Cents
(Written Amount)

ERIE COUNTY WATER AUTHORITY
CONTRACT NO: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS

Bidder acknowledges that estimated quantities of items of Unit Price Work are not guaranteed and final payment will be based on actual quantities of Unit Price Work performed as provided in the Contract Documents.

6.01 Bidder agrees that the Work will be substantially complete and completed and ready for final payment in accordance with Paragraph 14.07.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated and special damages in the event of failure to complete the Work within the times specified above.

7.01 The following documents are attached to and made a condition of this Bid:

- A. Required Bid security in the amount of 5% of bid amount Dollars (\$ _____).
- B. Section 2875 of the Public Authorities Law, Ground for Cancellation of Contract by Public Authority.
- C. Section 2876 of the Public Authorities Law, Disqualification to Contract with Public Authority.
- D. Section 2878 of the Public Authorities Law, Non-Collusive Bidding Certification.
- E. Section 139 of State Finance Law, Lobbying.
- F. Required Bidder Qualifications Statement with supporting data.
- G. All addenda.

8.01 The terms used in this Bid will have the meanings indicated in the Instructions to Bidders and the General Conditions and Supplementary Conditions.

Respectfully submitted on November 1, 2016

ERIE COUNTY WATER AUTHORITY
CONTRACT NO: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS

If Bidder is:

An Individual

By _____
(Individual's Signature)

(Printed or Typed Name of Individual)

Doing business as _____

License or Registration Number: _____

Business Address: _____

Phone No.: _____ FAX No.: _____

A Partnership

By _____
(Firm Name)

(General Partner's Signature)

(Printed or Typed Name of General Partner)
(Attach evidence of authority to sign.)

License or Registration Number: _____

Business Address: _____

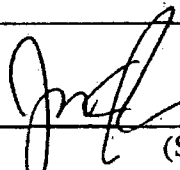
Phone No.: _____ FAX No.: _____

ERIE COUNTY WATER AUTHORITY
CONTRACT NO: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS

A Corporation

By STC Construction, Inc.
(Corporation Name)


New York
(State of Incorporation)

By 
(Signature of Officer Authorized to Sign)

Jason C. Rice, Vice President
(Printed or Typed Name and Title of Officer Authorized to Sign)
(Attach evidence of authority to sign.)

(CORPORATE

SEAL)

Attest 
Mark D. Brammer (Secretary)

License or Registration Number: _____

Business Address: 63 Zaar Valley Road, P.O. Box 459
Springville, NY 14141-0459

Phone No.: 716-592-2794 FAX No.: 716-592-4367

ERIE COUNTY WATER AUTHORITY
CONTRACT NO: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS

Limited Liability Company

By _____
(Firm Name)

(State of Formation)

By _____
(Signature of Member/Authorized to Sign)

(Printed or Typed Name and Title of Member Authorized to Sign)
(Attach evidence of authority to sign.)

License or Registration Number: _____

Business Address: _____

Phone No.: _____ FAX No.: _____

ERIE COUNTY WATER AUTHORITY
CONTRACT NO: NC-34
STURGEON POINT RAW WATER PUMP STATION IMPROVEMENTS

A Joint Venture

Joint Venture Name: _____

By _____
(Signature)

(Printed or Typed Name) (Title)

(Address)

By _____
(Signature)

(Printed or Typed Name) (Title)

(Address)

Phone and FAX number and address for receipt of communications to joint venture:

(Each joint venturer must sign. The manner of signing for each individual, partnership, corporation or limited liability company that is a party to the joint venture shall be in the manner indicated above).

END OF BID FORM

STC
Construction, Inc.

**CERTIFIED COPY OF RESOLUTION OF
BOARD OF DIRECTORS
OF
STC CONSTRUCTION, INC.**

RESOLVED that Jason C. Rice, Vice President to STC Construction, Inc., be authorized to sign and submit the bid for this corporation for the following:

Erie County Water Authority
Sturgeon Point Raw Water Pump Station Improvements
Contract No. NC-34

The foregoing is a true and correct copy of the resolution adopted by STC Construction, Inc. at a meeting of its Board of Directors held on the 28th day of October 2016.

By


Mark D. Brammer, Secretary

STC Construction, Inc.
P.O. Box 459
Springville, New York 14141-0459

State of Incorporation: New York

(SEAL)

Phone: 716-592-3400 • Fax: 716-592-4367

63 Zoor Valley Road • Springville, NY 14141
Mailing Address: P.O. Box 459 • Springville, NY 14141-0459

**ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK**

**CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175**

SECTION 00430

BID FORM SUPPLEMENTS

Bid Security Form

Section 2875 of the Public Authorities Law

Section 2876 of the Public Authorities Law

Section 2878 of the Public Authorities Law

Section 139 of State Finance Law

BID SECURITY FORM

BIDDER (Name and Address):

STC Construction, Inc.
63 Zoar Valley Road
Springville, NY 14141

SURETY (Name and Address of Principal Place of Business):

Fidelity and Deposit Company of Maryland
PO Box 968038
Schaumburg, IL 60196

OWNER:

Erie County Water Authority
295 Main Street, Room 350
Buffalo, New York 14203

BID

BID DUE DATE: 11/1/2016

PROJECT:

Contract No: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
Project No: 201500175

BOND

BOND NUMBER: N/A
DATE: (Not later than Bid due date): 11/1/2016
PENAL SUM: Five Percent of the Total Amount Bid - - - 5%
(Words) (Figures)

IN WITNESS WHEREOF. Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

STC Construction, Inc. (Seal)

Bidder's Name and Corporate Seal

By: Jason C. Rice, Vice-President
Signature and Title
Jason C. Rice, Vice-President

Attest: Tamara L. Collins
Signature and Title Tamara L. Collins

SURETY

Fidelity and Deposit Company of Maryland (Seal)

Surety's Name and Corporate Seal

By: Bradley J. Hall
Signature and Title Bradley J. Hall, Attorney-In-Fact
(Attach Power of Attorney)

Witness: Colleen A. Kendziora
Attest: Colleen A. Kendziora

1.01 Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.

2.01 Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.

3.01 This obligation shall be null and void if:

- A. OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents, or
- B. All Bids are rejected by OWNER, or
- C. OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5.01 hereof).

4.01 Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5.01 Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6.01 No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4.01 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7.01 Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8.01 Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9.01 Surety shall cause to be attached to this Bond a current and effective Power of Attorney, evidencing the authority of the officer, agent or representative, who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.

10.01 This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11.01 The term "Bid" as used herein includes a Bid, offer or proposal as applicable.

END OF BID BOND

ACKNOWLEDGMENT OF PRINCIPAL

STATE OF New York)
) SS.:
COUNTY OF Erie)

On the 1st day of November in the year 2016, before me, the undersigned, personally appeared Jason C. Rice, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Tamara L. Collins
Notary Public

ACKNOWLEDGMENT OF SURETY

TAMARA L. COLLINS
Notary Public, State of New York
0100259329
Qualified in Erie County
My Commission Expires April 8, 2020

STATE OF New York)
) SS.:
COUNTY OF Erie)

On the 1st day of November in the year 2016, before me, the undersigned, personally appeared Bradley J. Hall, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

COLLEEN A. KENDZIORA
NOTARY PUBLIC STATE OF NEW YORK
ERIE COUNTY
COMM. EXP. 03/23/20 AK

Colleen A. Kendziora
Notary Public

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by MICHAEL BOND, Vice President, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint Christopher D. ROSS, Victoria RIVERA, Bradley J. HALL, Colleen A. KENDZIORA, Timothy M. TOOLE, Lori A. FAY and Alissa J. WOLF, all of Buffalo, New York, EACH its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: any and all bonds and undertakings, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND, this 26th day of May, A.D. 2016.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: Eric D. Barnes
Eric D. Barnes
Secretary
Eric D. Barnes

Michael Bond
Michael Bond
Vice President
Michael Bond

State of Maryland
County of Baltimore

On this 26th day of May, A.D. 2016, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, MICHAEL BOND, Vice President, and ERIC D. BARNES, Secretary, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposed and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski
Maria D. Adamski
Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2019



FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

**Statement of Financial Condition
As Of December 31, 2015**

ASSETS

Bonds	\$ 142,878,497
Stocks	22,315,096
Cash and Short Term Investments.....	337,835
Rinsurance Recoverable	24,731,651
Other Accounts Receivable.....	19,935,844
TOTAL ADMITTED ASSETS	\$ 210,198,923

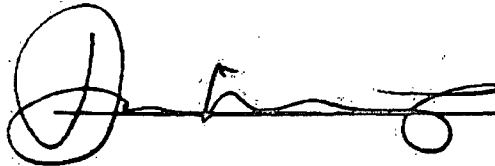
LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses.....	\$ 46,436
Ceded Reinsurance Premiums Payable	40,456,309
Securities Lending Collateral Liability	0
TOTAL LIABILITIES	\$ 40,502,745
Capital Stock, Paid Up	\$ 5,000,000
Surplus	164,696,178
Surplus as regards Policyholders.....	169,696,178
TOTAL	\$ 210,198,923

Securities carried at \$57,996,983 in the above statement are deposited with various states as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of market quotations for all bonds and stocks owned, the Company's total admitted assets at December 31, 2015 would be \$212,137,795 and surplus as regards policyholders \$171,635,049.

I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2015.



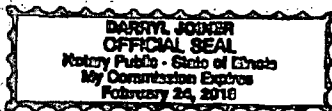
 Corporate Secretary

State of Illinois }
 City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2016.



 Notary Public



SECTION 2875 OF THE PUBLIC AUTHORITIES LAW

§2875. GROUND FOR CANCELLATION OF CONTRACT BY PUBLIC AUTHORITY.

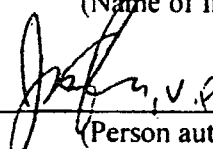
A clause shall be inserted in all specifications or contracts hereafter made or awarded by any public authority or by any official of any public authority created by the state or any political subdivision, for work or services performed or to be performed or goods sold or to be sold, to provide that upon the refusal of a person, when called before a grand jury, head of a state department, temporary state commission, or other state agency, the organized crime task force in the department of law, head of a city department, or other city agency, which is empowered to compel the attendance of witnesses and examine them under oath, to testify in an investigation concerning any transaction or contract had with the state, any political subdivision thereof or of a public authority, to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant question concerning such transaction or contract.

(a) Such person, and any firm, partnership or corporation of which he is a member, partner, director or officer shall be disqualified from thereafter selling to or submitting bids to or receiving awards from or entering into any contracts with any public authority or official thereof, for goods, work or services, for a period of five years after such refusal, and to provide also that;

(b) any and all contracts made with any public authority or official thereof, since the effective date of this law, 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 public authority without incurring any penalty or damages on account of such cancellation or termination, but any monies owing by the public authority for goods delivered or work done prior to the cancellation termination shall be paid.

This is to CERTIFY that neither the undersigned nor any member, partner, director, or officer of the firm has refused to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant question concerning a transaction or contract with the state, any political subdivision thereof, a public authority or with a public department, agency or official of the state or of any political subdivision thereof or of a public authority, when called before a grand jury, head of a state department, temporary state commission, or other state agency, the organized crime task force in the department of law, head of a city department, or other city agency, which is empowered to compel the attendance of witnesses and examine them under oath.

STC Construction, Inc.
(Name of Individual, Partnership or Corporation)

By 
(Person authorized to sign)

Jason C. Rice, Vice President

(SEAL)

SECTION 2876 OF THE PUBLIC AUTHORITIES LAW

§2876. DISQUALIFICATION TO CONTRACT WITH PUBLIC AUTHORITY

Any person who, when called before a grand jury, head of a state department, temporary state commission or other state agency, the organized crime task force in the department of law, head of a city department or other city agency, which is empowered to compel the attendance of witnesses and examine them under oath to testify in an investigation concerning any transaction or contract had with the state, any political subdivision thereof, a public authority or with a public department, agency or official of the state or of any political subdivision thereof or of a public authority, refuses to sign a waiver of immunity against subsequent criminal prosecution or to answer any relevant questions concerning such transaction or contract, and any firm, partnership or corporation of which he is a member, partner, director or officer shall be disqualified from thereafter selling to or submitting bids to or receiving awards from or entering into any contracts with any public authority or any official of any public authority created by the state or any political subdivision, for goods, work or services, for a period of five years after such refusal or until a disqualification shall be removed pursuant to the provisions of section twenty-six hundred three of this article.

It shall be the duty of the officer conducting the investigation before the grand jury, the head of a state department, the chairman of the temporary state commission or other state agency, the organized crime task force in the department of law, the head of a city department or other city agency before which the refusal occurs to send notice of such refusal, together with the names of any firm, partnership or corporation of which the person so refusing is known to be a member, partner, officer or director, to the commissioner of transportation of the state of New York, or the commissioner of general services as the case may be, and the appropriate departments, agencies and officials of the state, political subdivisions thereof or public authorities with whom the persons so refusing and any firm, partnership or corporation of which he is a member, partner, director or officer, is known to have a contract. However, when such refusal occurs before a body other than a grand jury, notice of refusal shall not be sent for a period of ten days after such refusal occurs. Prior to the expiration of this ten day period, any person, firm, partnership or corporation which has become liable to the cancellation or termination of a contract or disqualification to contract on account of such refusal may commence a special proceeding at a special term of the supreme court, held within the judicial district in which the refusal occurred, for an order determining whether the questions in response to which the refusal occurred were relevant and material to the inquiry. Upon the commencement of such proceeding, the sending of such notice of refusal to answer shall be subject to order of the court in which the proceeding was brought in a manner and on such terms as the court may deem just. If a proceeding is not brought within ten days, notice of refusal shall thereupon be sent as provided herein.

SECTION 2878 OF THE PUBLIC AUTHORITIES LAW

§2878. STATEMENT OF NON-COLLUSION IN BIDS OR PROPOSALS TO PUBLIC AUTHORITY.

(1) Every bid or proposal hereafter made to a public authority or to any official of any public authority created by the state or any political subdivision, where competitive bidding is required by statute, rule, regulation or local law, for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed by the bidder and affirmed by such bidder as true under the penalties of perjury:

NON-COLLUSIVE BIDDING CERTIFICATION

(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.

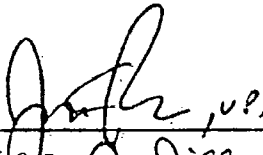
(b) A bid shall not be considered for award nor shall any award be made where (a) (1) (2) and (3) above have not been complied with; provided, however, that if in any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which 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 state, public department or agency to which the bid is made, or his designee, determines that such disclosure was not made for the purpose of restricting competition.

The fact that a bidder (a) has published price lists, rates, or tariffs covering items to be procured, (b) has informed prospective customers of proposed or pending publication of new or revised price lists for such items, or (c) has sold the same items to other customers at the same prices being bid, does not constitute, without more, a disclosure within the meaning of subparagraph one (a).

The undersigned CERTIFIES, under penalty of perjury, that he is authorized to make this bid and execute this statement of non-collusion; that each of the statements contained in (1), (2) and (3) of paragraph (a) are true; that he is familiar with the statements and restrictions contained in paragraph (b) and the paragraph regarding the publication of price lists, etc. and such statements and restrictions are true and have been complied with by the bidder.

STC Construction, Inc.

(Name of Individual, Partnership, or Corporation)

By  , v.p.
Jason C. Rice, Vice President

(SEAL)

FORMS A, B, and C

SECTION 139 OF STATE FINANCE LAW

Pursuant to State Finance Law §§139-j and 139-k, this Invitation to Bid includes and imposes certain restrictions on communications between a Governmental Entity and an Offerer/bidder during the procurement process. An Offerer/bidder is restricted from making contacts from the earliest notice of intent to solicit offers, through final award and approval of the Procurement Contract by the Governmental Entity. The designated contact is identified in the Notice to Bidders. Governmental Entity employees are also required to obtain certain information when contacted during the restricted period and make a determination of the responsibility of the Offerer/bidder pursuant to these two statutes. Certain findings of non-responsibility can result in rejection for contract award and in the event of two findings within a 4-year period, the Offerer/bidder is debarred from obtaining governmental Procurement Contracts. Further information about these requirements can be found in §§139-j and 139-k of the New York State Finance Law and the Erie County Water Authority's Procurement Disclosure Policy.

Form A - Offerer's Affirmation of Understanding of and Agreement pursuant to State Finance Law.

Form B - Offerer's Certification of Compliance with State Finance Law.

Form C - Offerer's Disclosure of Prior Non-Responsibility Determinations.

Contract Termination Provision.

FORM A

Offerer's Affirmation of Understanding of and Agreement Pursuant to State Finance Law §139-j(3) and §139-j(6)(b)

Instructions:

A Governmental Entity must obtain the required affirmation of understanding and agreement to comply with procedures on procurement lobbying restrictions regarding permissible contacts in the restricted period for a procurement contract in accordance with State Finance Law §139-j and §139-k. It is required that this affirmation be obtained as early as possible in the procurement process, but no later than when the Offerer submits its proposal.

Offerer affirms that it understands and agrees to comply with the procedures of the Government Entity relative to permissible contacts as required by State Finance Law §139-j(3) and §139-j(6)(b).

By: [Signature], v.e. Date: 11/11/16

Name: Jason C. Rice

Title: Vice President

Contractor Name: STC Construction, Inc.

Contractor Address: 123 Zoar Valley Road

P.O. Box 459

Springville, NY 14141-0459

FORM B

**Offerer's Certification of Compliance
With State Finance Law §139-k(5)**

Instructions:

A Governmental Entity must obtain the required Certification that the information is complete, true, and accurate regarding any prior findings of non-responsibility, such as non-responsibility pursuant to State Finance Law §139-j. The Offerer must agree to the Certification and provide it to the procuring Governmental Entity. It is required that the Certification be obtained as early as possible in the process, but no later than when an Offerer submits its proposal.

Offerer Certification:

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

By: Jason C. Rice, v.e. Date: 11/1/12

Name: Jason C. Rice

Title: Vice President

Contractor Name: STC Construction, Inc.

Contractor Address: 63 Zoar Valley Road

P.O. Box 459

Springville, New York 14141-0459

FORM C**Offerer's Disclosure of Prior
Non-Responsibility Determinations****Background:**

New York State Finance Law §139-k(2) obligates a Governmental Entity to obtain specific information regarding prior non-responsibility determinations with respect to State Finance Law §139-j. In accordance with State Finance Law §139-k, an Offerer must be asked to disclose whether there has been a finding of non-responsibility made within the previous four (4) years by any Governmental Entity due to: (a) a violation of State Finance Law §139-j; or (b) the intentional provision of false or incomplete information to a Government Entity.

The terms "Offerer" and "Governmental Entity" are defined in State Finance Law §139-k(1). State Finance Law §139-j sets forth detailed requirements about the restrictions on contacts during the procurement process. A violation of State Finance Law §139-j includes, but is not limited to, an impermissible contact during the restricted period (for example, contacting a person or entity other than the designated contact person, when such contact does not fall within one of the exemptions).

As part of its responsibility determination, State Finance Law §139-k(3) mandates consideration of whether an Offerer fails to timely disclose accurate or complete information regarding the above non-responsibility determination. In accordance with law, no Procurement Contract shall be awarded to any Offerer that fails to timely disclose accurate or complete information under this section, unless a finding is made that the award of the Procurement Contract to the Offerer is necessary to protect public property or public health safety, and the Offerer is the only source capable of supplying the required Article of Procurement within the necessary timeframe. See State Finance Law §139-j(10)(b) and §139-k(3).

Instructions:

A Governmental Entity must include a disclosure request regarding prior non-responsibility determinations in accordance with State Finance Law §139-k in its solicitation of proposals or bid documents or specifications or contract documents, as applicable, for procurement contracts. The attached form is to be completed and submitted by the individual or entity seeking to enter into a Procurement Contract. It shall be submitted to the Governmental Entity conducting the Governmental Procurement no later than when the Offerer submits its proposal.

FORM C (Continued)

Offerer's Disclosure of Prior Non-Responsibility Determinations

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

STC Construction, Inc.

Address: Le3 Zoar Valley Road, P.O. Box 459
Springville, New York 14141-0459

Name and Title of Person Submitting this Form:

Jason C. Rice, Vice President

Contract Procurement Number: NC-34

Date: 11/1/16

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

If yes, please answer the next questions:

2. Was the basis for the finding of non-responsibility due to a violation of State Finance Law §139-j (Please circle): No Yes

3. Was the basis for the finding of non-responsibility due to the intentional provision of false or incomplete information to a Governmental Entity? (Please circle) No Yes

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

Governmental Entity: _____

Date of Finding of Non-Responsibility: _____

Basis of Finding of Non-Responsibility: _____

(Add additional pages as necessary)

FORM C (Continued)

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

6. If yes, please provide details below.
Governmental Entity: _____

Date of Termination or Withholding of Contract: _____

Basis of Termination or Withholding:

(Add additional pages as necessary)

Offerer certifies that all information provided to the Governmental Entity with respect to State Finance Law §139-k is complete, true, and accurate.

By: Jason C. Rice, V.P. Date: 11/1/16
Signature

Name: Jason C. Rice

Title: Vice President

Contract Termination Provision

Instructions:

A Contract Termination Provision will be included in each Procurement Contract governed by State Finance Law §139-k. New York State Finance Law §139-k(5) provides that every procurement contract award subject to the provisions of State Finance Law §§139-k and 139-j shall contain a provision authorizing the Governmental Entity to terminate the contract in the event that the certification is found to be intentionally false or intentionally incomplete. This statutory contract language authorizes, but does not mandate, termination. "Government Entity" and "procurement contract" are defined in State Finance Law §139-k(l).

This required clause will be included in a covered procurement contract.

A sample of the Termination Provision is included below. If a contract is terminated in accordance with State Finance Law §139-k(5), the Governmental Entity is required to include a statement in the procurement record describing the basis for any action taken under the termination provision.

Sample Contract Termination Provision

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

END OF BID FORM SUPPLEMENTS

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

SECTION 00450

BIDDER'S QUALIFICATION STATEMENT

(Completion of this statement is required in advance of
consideration for award of Contract.)

SUBMITTED TO:

Erie County Water Authority
295 Main Street, Room 350
Buffalo, New York 14203

SUBMITTED FOR:

Erie County Water Authority
Contract No: NC-34
Raw Water Pump Station Improvements,
ECWA Project No. 201500175

SUBMITTED BY:

Name of Organization: STC Construction, Inc.
(Print or Type Name of Bidder)

Name of Individual: Jason C. Rice

Title: Vice President

Business Address: 63 Zoar Valley Road

Springville, New York 14141-0459

Telephone No.: 716-592-3400

Fax No.: 716-592-4367

Gentlemen:

The undersigned certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter.

(Note: Attach additional sheets as required.)

1.0 Bidder's General Business Information

1.1 Check if:

Corporation Partnership Joint Venture Sole Proprietorship

If Corporation:

A. Date and State of Incorporation:

8/11/96 - New York

B. List of Executive Officers:

Name	Title
mark A. Brammer	President
Jason C. Rice	Vice President

If Partnership:

A. Date and State of Organization:

B. Names of Current General Partners:

C. Type of Partnership

General Publicly Traded
 Limited Other (described): _____

If Joint Venture:

A. Date and State of Organization:

B. Name, Address and Form of Organization of Joint Venture Partners: (Indicate managing partner by an asterisk *):

If Sole Proprietorship:

A. Date and State of Organization:

B. Name and Address of Owner or Owners:

2.0 How many years has your organization been in business as a general contractor? 20

3.0 If your organizational structure has changed within the past five years, provide data as listed above in Item 1.0 for your previous organization.

4.0 We normally perform 80-85% percent of the work with our own forces. List work normally subcontracted. Electrical, Painting, Paving, Rebar, Fencing

5.0 Has any construction contract to which you have been a party been terminated by the owner; have you ever terminated work on a project prior to its completion for any reason; has any surety which issued a performance bond on your behalf ever completed the work in its own name or financed such completion on your behalf; has any surety expended any monies in connection with a contract for which they furnished a bond on your behalf? If the answer to any portion of this question is "yes", furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project. NO

- 6.0 Has any officer or partner of your organization ever been an officer or partner of another organization that had any construction contract terminated by the owner; terminated work on a project prior to its completion for any reason; had any surety which issued a performance bond complete the work in its own name or financed such completion; or had any surety expend any monies in connection with a contract for which they furnished a bond? If the answer to any portion of this question is "yes", furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project. **NO**
- 7.0 In the last five years, has your organization, or any predecessor organization, failed to substantially complete a project in a timely manner? If the answer to this question is "yes", furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project. **NO**
- 8.0 On Schedule A, attached, list name, location and description of project, owner, architect or engineer, contract price, percent complete and scheduled completion of the major construction projects your organization has in progress on this date. Provide name, address and telephone number of a reference for each project listed.
- 9.0 On Schedule B, attached, list name, location and description of project, owner, architect or engineer, contract price, date of completion and percent of work with your own forces of major projects of the same general nature as this project which your organization has completed in the past five years. Provide name, address and telephone number of a reference for each project listed.
- 10.0 On Schedule C, attached, list name and construction experience of the principal individuals of your organization directly involved in construction operations.
- 10.1 On Schedule D, attached, list OSHA Information requested.
- 11.0 List the states and categories of construction in which your organization is legally qualified to do business. **NY and PA**
- 12.0 Provide the following for your surety:

12.1 Surety Company: Fidelity and Deposit Co. of Maryland

12.2 Agent: Lawley Agency, LLC

A. Address: 361 Delaware Ave, Buffalo, NY 14202

B. Telephone No.: 716-849-8696

12.3 What is your approximate total bonding capacity?

- \$500,000 to \$2,000,000
- \$2,000,000 to \$5,000,000
- \$5,000,000 to \$10,000,000
- \$10,000,000 or more

13.0 Provide the following with respect to an accredited banking institution familiar with your organization.

13.1 Name of Bank: MAT Bank

13.2 Address: One Fountain Plaza, Buffalo, NY 14203-1495

13.3 Account Manager: Alexis Agnello

13.4 Telephone No.: 716-848-7479

14.0 Provide the name, address and telephone number of an individual who represents a major equipment/material supplier whom the Owner may contact for a financial reference:

mark koester koester associates, Inc., 3101 Seneca Turnpike, Canastota, NY 13032 585-697-3800

15.0 Attach a financial statement, prepared on an accrual basis, in a form which clearly indicates Bidder's assets, liabilities and net worth.

15.1 Date of financial statement: 12/31/15

15.2 Name of firm preparing statement: Clark & Nihill

16.0 Dated at Springville, NY this 1st day of November, 2016.

Bidder: STC Construction, Inc.
(Print or Type Name of Bidder)

By: [Signature], v.p.

Jason C. Rice

Title: Vice President

Attachments A, B, C, and D

(Seal, if corporation)

------(Affidavit for Individual)-----

_____ being duly sworn, deposes and says that:
a) the financial statement, taken from his/her books, is a true and accurate statement of his/her financial condition as of the date thereof; and b) all of the foregoing qualification information is true, complete, and accurate.

------(Affidavit for Partnership)-----

_____ being duly sworn, deposes and says that:
a) he/she is a member of the partnership of _____;
b) he/she is familiar with the books of said partnership showing its financial condition; c) the financial statement, taken from the books of said partnership, is a true and accurate statement of the financial condition of the partnership as of the date thereof; and d) all of the foregoing qualification information is true, complete, and accurate.

------(Affidavit for Corporation)-----

Jason C. Rice being duly sworn, deposes and says that:
a) he/she is Vice President of STC Construction, Inc.;
(Full name of Corporation)
b) he/she is familiar with the books of said corporation showing its financial condition; c) the financial statement, taken from the books of said corporation, is a true and accurate statement of the financial condition of said corporation as of the date thereof; and d) that all of the foregoing qualification information is true, complete, and accurate.

------(Acknowledgment)-----

Jason C. Rice being duly sworn, deposes and says that he/she is Vice President of STC Construction, Inc.;
(Name of Bidder)

that he/she is duly authorized to make the foregoing affidavit and that he/she makes it on behalf of

() himself/herself; () said partnership; (X) said corporation.

Sworn to before me this 1st day of November, 2016, in the County of Erie, State of New York.

Tamara L. Collins
(Notary Public)

My commission expires 4/9/2020

(Seal)

TAMARA L COLLINS
Notary Public, State of New York
01CO6259368
Qualified in Erie County
My Commission Expires April 9, 2020

END OF BIDDER QUALIFICATIONS STATEMENT

STC CONSTRUCTION, INC.

AND AFFILIATES

**FINANCIAL STATEMENTS
(REVIEWED)**

YEARS ENDED DECEMBER 31, 2015 AND 2014



CLARK & NEILL CPAs LLP
Certified Public Accountants

1325 Union Road, West Seneca, NY 14224
716-674-4459 / www.cnpa.com

Board of Directors
STC Construction, Inc.
and Affiliates

Accountant's Conclusion

Based on our reviews, we are not aware of any material modifications that should be made to the accompanying financial statements in order for them to be in conformity with accounting principles generally accepted in the United States of America.

Supplementary Information

The supplementary information included in Schedules I, II and III is presented for purposes of additional analysis and is not a required part of the basic financial statements. The information is the representation of management. We have reviewed the information and, based on our review, we are not aware of any material modifications that should be made to the information in order for it to be in accordance with accounting principles generally accepted in the United States of America. We have not audited the information and, accordingly, do not express an opinion on such information.

Clark & Hill CPA, LLP
Certified Public Accountants
May 25, 2016

LIABILITIES AND STOCKHOLDERS' EQUITY

	<u>2015</u>	<u>2014</u>
CURRENT LIABILITIES:		
Line of credit	\$ 154,661	\$ 24,951
Current portion, long-term debt	77,326	54,086
Shareholder loan payable	4,400	-
Accounts payable - trade	3,948,396	1,519,454
Accounts payable - affiliate	31,241	-
Accrued payroll and payroll taxes	149,342	177,345
Accrued expenses	48,898	5,356
Accrued profit sharing	144,378	160,875
Billings in excess of costs and estimated earnings	698,220	689,806
TOTAL CURRENT LIABILITIES	<u>5,256,862</u>	<u>2,631,873</u>
LONG -TERM DEBT	<u>144,467</u>	<u>126,919</u>
TOTAL LIABILITIES	<u>5,401,329</u>	<u>2,758,792</u>
STOCKHOLDERS' EQUITY:		
Common stock, no par value, 600 shares authorized, 220 shares issued and outstanding	68,188	68,188
Retained earnings	3,709,260	3,480,903
	3,777,448	3,549,091
Less: Treasury stock, 80 shares at cost	<u>1,410,000</u>	<u>1,410,000</u>
TOTAL STOCKHOLDERS' EQUITY	<u>2,367,448</u>	<u>2,139,091</u>
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	<u>\$ 7,768,777</u>	<u>\$ 4,897,883</u>

See accompanying notes and independent accountants' review report.

ATTACHMENT A

SCHEDULE A
PROJECTS IN PROGRESS

<u>Name, Location and Description of Project</u>	<u>Owner</u>	<u>Architect or Engineer</u>	<u>Contract Price</u>	<u>Percent Complete</u>	<u>Scheduled Completion</u>	<u>Reference/Contract Include Address and Phone</u>
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See attached



STC Construction, Inc.

Completed Projects/Work in Progress



UPDATED 5/16

Description of Project	Owner	Engineer	Date	Contract Value	Contact Name
WASTEWATER TREATMENT FACILITY PHASE I HEADWORKS IMPROVEMENTS	VILLAGE OF PERRY 46 N. MAIN STREET PERRY, NY 14530	CLARK PATTERSON LEE 205 ST. PAUL STREET, SUITE 500 ROCHESTER, NY 14604	2016	\$949,200 0% Complete	JASON A. FOOTE, P.E. 800-274-9000
SEWAGE TREATMENT PLANT IMPROVEMENTS	CHAUTAQUA UTILITY DISTRICT P.O. BOX M; RAMBLE AVENUE CHAUTAQUA, NY 14722	NUSSBAUMER & CLARKE, INC. 3556 LAKE SHORE ROAD, SUITE 500 BUFFALO, NY 14219-1494	2016	\$5,489,800 3% Complete	MARIE A. NOWAK, PE 716-827-8000
PINE HILL PUMP STATION IMPROVEMENTS	ERIE COUNTY WATER AUTHORITY 3030 UNION ROAD BUFFALO, NY 14227	ARCADIS CE, INC. 50 FOUNTAIN PLAZA, SUITE 600 BUFFALO, NY 14202	2015	\$2,352,000 1% Complete	RICHARD ROSENBERY, PE 716-684-1510
PROCESS AERATION BLOWER REPLACEMENT	VILLAGE OF FREDONIA WWTP 9-11 CHURCH STREET FREDONIA, NY 14063	O'BRIEN & GERE ENGINEERS, INC. 400 ANDREWS STREET, SUITE 710 ROCHESTER, NY 14604	2015	\$1,093,500 80% Complete	B. ANDREW FRASER, PE 585-295-7700
REPAIR CLARIFIER TANK NO. 2	CITY OF LOCKPORT ONE LOCKS PLAZA LOCKPORT, NY 14094	CITY OF LOCKPORT ENGINEERING ONE LOCKS PLAZA LOCKPORT, NY 14094	2015	\$128,969	ROLANDO MORENO, CE 716-439-6750
ELLCOTTVILLE WWTP IMPROVEMENTS	VILLAGE OF ELLICOTTVILLE 1 W. WASHINGTON ST., P.O. BOX 475 ELLCOTTVILLE, NY 14731	NUSSBAUMER & CLARKE, INC. 3556 LAKE SHORE ROAD, SUITE 500 BUFFALO, NY 14219-1494	2015	\$4,278,900 95% Complete	SETH KRULL, P.E. 716-827-8000
SUNSET BAY PUMP STATION	TOWN OF HANOVER 68 HANOVER STREET SILVER CREEK, NY 14138	GHD CONSULTING SERVICES, INC. 200 JOHN JAMES AUDUBON PKWY AMHERST, NY 14228	2015	\$272,706 3% Complete	GREGORY D. MCCORKHILL 716-748-6620
COAGULATION BASINS 1, 2 & 3 UPGRADES	NIAGARA COUNTY WATER DISTRICT 5450 ERNEST ROAD LOCKPORT, NY 14094	WENDEL COMPANIES 375 ESSJAY ROAD, SUITE 200 WILLIAMSVILLE, NY 14221	2015	\$1,108,980	MARIA SEEKINS 716-688-0766
STURGEON POINT FILTER REHABILITATION	ERIE COUNTY WATER AUTHORITY 285 MAIN STREET, ROOM 350 BUFFALO, NY 14203-2494	ERIE COUNTY WATER AUTHORITY 3030 UNION ROAD CHEEKTOWAGA, NY 14227	2015	\$1,326,680 38% Complete	DANIEL J. SEIDER, P.E. 716-684-1510



STC Construction, Inc.

Completed Projects/Work in Progress



UPDATED 5/16

Description of Project	Owner	Engineer	Date	Contract Value	Contact Name
ELMA PUMP STATION IMPROVEMENTS	COUNTY OF ERIE RATH BUILDING 95 FRANKLIN STREET BUFFALO, NY 14202	COUNTY OF ERIE RATH BUILDING 95 FRANKLIN STREET BUFFALO, NY 14202	2015	\$338,480 90% Complete	WILLIAM J. KRUG, P.E. 716-858-6000
WASTEWATER TREATMENT PLANT IMPROVEMENTS	TOWN OF HANOVER 68 HANOVER STREET SILVER CREEK, NY 14138	GHD CONSULTING SERVICES, INC. 200 JOHN JAMES AUDUBON PKWY AMHERST, NY 14228	2015	\$357,300 99% Complete	GREGORY D. MCCORKHILL 716-748-6620
SECONDARY CLARIFIER NO. 1 IMPROVEMENTS	TOWN OF NEWFANE 2737 MAIN STREET NEWFANE, NY 14108	WENDEL COMPANIES 375 ESSJAY ROAD, SUITE 200 WILLIAMSVILLE, NY 14221	2015	\$187,121	JAMIE L. JOHNSON, PE 716-888-0766
NYSDEC WESTERN REGION FLOOD CONTROL PUMP STATION UPGRADES	NYS DORMITORY AUTHORITY 515 BROADWAY ALBANY, NY 12207	NYS DORMITORY AUTHORITY 515 BROADWAY ALBANY, NY 12207	2015	\$6,091,000 70% Complete	RICK HANSEN 518-257-3000
MEYER ROAD AND THE PINES LIFT STATION IMPROVEMENTS	TOWN OF AMHERST 1100 NORTH FOREST ROAD WILLIAMSVILLE, NY 14221	WENDEL COMPANIES 140 JOHN JAMES AUDUBON PKWY SUITE 201 BUFFALO, NY 14228	2014	\$414,800	JEFF TELECKY 716-888-0766
IRVING WASTEWATER TREATMENT PLANT	SENECA NATION OF INDIANS HEALTH DEPARTMENT 987 RC HOAG DRIVE SALAMANCA, NY 14779	SENECA NATION OF INDIANS HEALTH DEPARTMENT 987 RC HOAG DRIVE SALAMANCA, NY 14779	2014	\$3,541,671	JOEL A. MERRILL, P.E. 716-945-5894 X5277
WATER PLANT CONSTRUCTION	VILLAGE OF BOLIVAR 252 MAIN STREET BOLIVAR, NY 14715	CLARK PATTERSON LEE 130 SOUTH UNION STREET SUITE FOUR OLEAN, NY 14760	2014	\$1,449,700	THOMAS G. SWIFT, P.E. 716-372-0514
WASTEWATER TREATMENT PLANT	VILLAGE OF FREDONIA 9-11 CHURCH STREET FREDONIA, NEW YORK 14083	WENDEL COMPANIES 140 JOHN JAMES AUDUBON PKWY BUFFALO, NY 14228	2014	\$34,925	BRIAN SIBIGA 716-888-0766



STC Construction, Inc.

Completed Projects/Work In Progress



UPDATED 5/16

Description of Project	Owner	Engineer	Date	Contract Value	Contact Name
WASTEWATER TREATMENT PLANT FACILITY IMPROVEMENTS	VILLAGE OF SILVER CREEK 172 CENTRAL AVENUE SILVER CREEK, NY 14138	WENDEL COMPANIES 140 JOHN JAMES AUDUBON PKWY BUFFALO, NY 14228	2014	\$2,824,566	BRIAN SIBIGA 716-888-0788
PHASE 2 WATER TREATMENT PLANT UPGRADES	CITY OF DUNKIRK 342 CENTRAL AVENUE DUNKIRK, NY 14048	HILL ENGINEERING 8 GIBSON STREET NORTH EAST, PA 16428	2014	\$1,625,500	AUGUST E. MAAS, P.E. 814-725-8659
COLONEL WARD LOW LIFT	CITY OF BUFFALO CITY HALL BUFFALO, NY 14202	JOHN W. DANFORTH CO. 300 COLVIN WOODS PARKWAY TONAWANDA, NY 14150	2013	\$45,828	MICHAEL SCHIFANO 716-832-1940
PRIMARY BYPASS MODIFICATIONS AT BIRD ISLAND	BUFFALO SEWER AUTHORITY 1038 CITY HALL 65 NIAGARA SQUARE BUFFALO, NY 14202-3378	ARCADIS 50 FOUNTAIN PLAZA, SUITE 600 BUFFALO, NY 14202	2013	\$761,684	JASON WILLIAMS, P.E. 716-667-0900
WASTEWATER TREATMENT PLANT EMERGENCY T&M CONTRACT	CITY OF LOCKPORT ONE LOCKS PLAZA LOCKPORT, NY 14094	CITY OF LOCKPORT ONE LOCKS PLAZA LOCKPORT, NY 14084	2013	\$33,967	ROLONDO MORENO 716-439-6750
COLD STORAGE BUILDING FOUNDATION	CATTARAUGUS COUNTY DPW 8810 ROUTE 242 LITTLE VALLEY, NY 14755	CATTARAUGUS COUNTY DPW 8810 ROUTE 242 LITTLE VALLEY, NY 14755	2013	\$250,212	NORM MARSH 716-938-9151
PUMP STATION 1 AND 2 REHABILITATION	PORTLAND, POMFRET, DUNKIRK SEWER DISTRICT P.O. BOX 167 MAYVILLE, NY 14757	MARK D. ALIANELLO, P.E. P.O. BOX 604 ELLCOTTVILLE, NY 14731	2013	\$124,780	JACOB ALIANELLO 716-699-4650
PECK HILL RD WATER TREATMENT PLANT	TOWN OF PERRYSBURG 40460 PECK HILL ROAD PERRYSBURG, NY 14129	MARK D. ALIANELLO, P.E. P.O. BOX 604 ELLCOTTVILLE, NY 14731	2013	\$636,362	JACOB ALIANELLO 716-699-4650



STC Construction, Inc.

Completed Projects/Work in Progress



UPDATED 5/16

Description of Project	Owner	Engineer	Date	Contract Value	Contact Name
BLDGS 3 AND 40 SLUDE COLLECTION MODIFICATIONS WATER POLLUTION CONTROL FACILITY	TOWN OF AMHERST 5583 MAIN STREET WILLIAMSVILLE, NY 14221	URS CORPORATION 77 GOODELL STREET BUFFALO, NY 14203	2012	\$2,874,800	RYAN DELAMERE 716-856-5636
CHAIN & FLIGHT EQUIPMENT REPLACEMENT	VILLAGE OF LITTLE VALLEY 103 ROCK CITY STREET LITTLE VALLEY, NY 14755	VILLAGE OF LITTLE VALLEY 103 ROCK CITY STREET LITTLE VALLEY, NY 14755	2012	\$49,000	NORM MARSH 716-938-9151
WWTP IMPROVEMENTS SOLIDS DEWATERING & FERRIC CHLORIDE UPGRADES	TOWN OF NEWFANE 2737 MAIN STREET NEWFANE, NY 14108	WENDEL COMPANIES 140 JOHN JAMES AUDUBON PKWY BUFFALO, NY 14228	2012	\$406,000	JAMIE L. JOHNSON, P.E. 716-688-0768
COAST GUARD PHASE 1A BULKHEAD REHABILITATION	THE CONIGLIO COMPANY 4400 COMMERCE AVENUE CLEVELAND, OHIO 44103	THE CONIGLIO COMPANY 4400 COMMERCE AVENUE CLEVELAND, OHIO 44103	2012	\$150,728	ROBYN L. SEDLAK 216-391-1800
HEADWORKS IMPROVEMENTS	VILLAGE OF ALBION 35-37 EAST BANK STREET ALBION, NY 14411	CHATFIELD ENGINEERS, P.C. 2800 DEWEY AVENUE ROCHESTER, NY 14816	2012	\$394,700	JOHN PAUL SCHEPP, P.E. 585-227-6040
NEW FLOOR SLAB REPLACEMENT	JAMESTOWN BPU 92 STEELE STREET JAMESTOWN, NY 14701	JAMESTOWN BPU 92 STEELE STREET JAMESTOWN, NY 14701	2012	\$53,185	STEVE KULIG 716-661-1670
WWTP IMPROVEMENTS	VILLAGE OF WILSON 375 LAKE STREET WILSON, NY 14172	NUSSBAUMER & CLARKE 3556 LAKE SHORE RD, SUITE 500 BUFFALO, NY 14219-1494	2012	\$1,160,519	RYAN K. SMITH, E.I.T. 716-827-8000
HIGH FLOW DIVERSION AND GATE INSPECTION	CITY OF LOCKPORT ONE LOCKS PLAZA LOCKPORT, NY 14084	WENDEL COMPANIES 140 JOHN JAMES AUDUBON PKWY BUFFALO, NY 14228	2012	\$221,000	BRIAN SIBIGA, PE 716-688-0768
TONAWANDA CREEK ROAD PUMP STATION AND SECONDARY CLARIFIER VALVE ACTUATOR UPGRADES	NIAGARA CO. SEWER DISTRICT 7346 LIBERTY DRIVE NIAGARA FALLS, NY 14304	CONESTOGA ROVERS 285 DELAWARE AVENUE, SUITE 500 BUFFALO, NY 14202	2012	\$369,800	DANIEL J. KOLKMAN 716-856-2142



STC Construction, Inc.

Completed Projects/Work In Progress



UPDATED 5/16

Description of Project	Owner	Engineer	Date	Contract Value	Contact Name
SCUM SYSTEM REPLACEMENT ACTUATOR REPLACEMENT POLYMER SYSTEM REPLACEMENT	TOWN OF AMHERST 1100 N. FOREST ROAD WILLIAMSVILLE, NY 14221	URS CORPORATION 77 GOODELL STREET BUFFALO, NEW YORK 14203	2012	\$1,333,000	JOHN GOEDDERTZ 716-856-5636
MASSACHUSETTS AVENUE PARK PHASE II JOB 1242	CITY OF BUFFALO DPW, PARKS & STREET 95 NIAGARA SQ., 604 CITY HALL BUFFALO, NY 14202-3306	WATTS ARCHITECTURE & ENGINEERING, PC 95 PERRY STREET, SUITE 300 BUFFALO, NY 14203-3030	2012	\$292,611	STEVEN STEPNIAK 716-851-5874
CONCRETE REHABILITATION	NIAGARA FALLS WATER BOARD 5815 BUFFALO AVENUE NIAGARA FALLS, NY 14304	CONESTOGA ROVERS 285 DELAWARE AVENUE, SUITE 500 BUFFALO, NY 14202	2012	\$223,680	DANIEL J. KOLKMAN 716-856-2142
STEAM MANHOLE REPAIRS AT ACADEMIC DRIVE	BUFFALO STATE 1300 ELMWOOD AVENUE BUFFALO, NY 14222-1085	DIDONATO ASSOCIATES, P.E., P.C. 689 MAIN STREET BUFFALO, NY 14203	2012	\$43,325	BRIAN WITTMER 716-878-3501
JOINT MUNICIPAL INDUSTRIAL POLLUTION CONTROL FACILITY	VILLAGE OF ALBION 35-37 EAST BANK STREET ALBION, NY 14411	CHATFIELD ENGINEERS, P.C. 2800 DEWEY AVENUE ROCHESTER, NY 14616	2012	\$574,863	JOHN PAUL SCHEPP, P.E. 585-227-6040
FILTER RENOVATIONS	CITY OF DUNKIRK 342 CENTRAL AVENUE DUNKIRK, NY 14048	HILL ENGINEERING, INC. 8 GIBSON STREET NORTH EAST, PA 16428	2012	\$583,000	AUGUST E. MAAS, P.E. 814-725-8659
CRESENT AVENUE PUMP STATION ERIE COUNTY SEWER DISTRICT NO. 3	ERIE COUNTY 95 FRANKLIN STREET BUFFALO, NEW YORK 14202	CONESTOGA ROVERS 285 DELAWARE AVENUE, SUITE 500 BUFFALO, NY 14202	2011	\$328,502	JUSTIN RUSSELL 716-856-2142
WATER POLLUTION CONTROL PLANT IMPROVEMENTS	VILLAGE OF BROCTON 34 W. MAIN STREET BROCTON, NY 14716	E & M ENGINEERS & SURVEYORS P.O. BOX 159 SPRINGVILLE, NY 14141	2011	\$4,100,000	GLENN COOLEY, PE 716-592-2851



STC Construction, Inc.

Completed Projects/Work in Progress



UPDATED 5/16

Description of Project	Owner	Engineer	Date	Contract Value	Contact Name
SCADA SYSTEM, FLOW METERS AND BACKUP POWER	SOUTH AND CENTER CHAUTAQUA LAKE SEWER DISTRICTS P.O. BOX 458 CELERON, NY 14720-0458	GHD CONSULTING ENGINEERS, LLC 415 NORTH FRENCH RD, SUITE 100 AMHERST, NY 14228	2011	\$535,980	BARRY BEEBE 716-691-8503
COLONEL WARD HIGH LIFT PUMP STATION (SUB TO IROQUOIS BAR CORP)	CITY OF BUFFALO DPW 602 CITY HALL BUFFALO, NEW YORK 14202	CONESTOGA ROVERS 285 DELAWARE AVENUE, SUITE 500 BUFFALO, NY 14202	2011	\$2,131,009	DANIEL J. KOLKMANN 716-656-2142
WWTP IMPROVEMENTS - INFLUENT BAR SCREEN INSTALLATION	VILLAGE OF SPRINGVILLE P.O. BOX 17 SPRINGVILLE, NY 14141-0017	GHD CONSULTING ENGINEERS, LLC 415 NORTH FRENCH RD, SUITE 100 AMHERST, NY 14228	2011	\$424,272	JOHN STORY 716-691-8503
NEWTOWN WWTP PHASE II	SENECA NATION CIA P.O. BOX 228 SALAMANCA, NY 14779-0231	C & S ENGINEERS, INC. 499 COL. EILEEN COLLINS BLVD. SYRACUSE, NY 13212	2010	\$3,544,728	BOB PALLADINE 315-455-2000
ZOTOS WIND POWER GENERATION FACILITY	ZOTO'S INTERNATIONAL, INC. P.O. BOX 71 GENEVA, NEW YORK 14456-1294	PLANT IQ 3887 ONTARIO DRIVE WHEATFIELD, NY 14120	2010	\$524,787	MARK MASSA 716-810-2859
COLONEL WARD PUMP STATION SOUTH BASIN IMPROVEMENTS	CITY OF BUFFALO DPW 602 CITY HALL BUFFALO, NEW YORK 14202	MALCOLM PIRNIE, INC. 50 FOUNTAIN PLAZA, SUITE 600 BUFFALO, NEW YORK 14202	2010	\$1,312,651	DOUG FULTZ 716-667-0900
SHADAGEE ROAD PUMP STATION	TOWN OF EDEN 2785 EAST CHURCH STREET EDEN, NEW YORK 14057	CONESTOGA ROVERS 285 DELAWARE AVENUE, SUITE 500 BUFFALO, NY 14202	2010	\$781,727	DANIEL J. KOLKMANN 716-656-2142
F & I UNDERGROUND UTILITIES (SUB TO MOLLENBERG-BETZ, INC.)	PRAXAIR 175 EAST PARK DRIVE TONAWANDA, NY 14150	CABRERA SERVICES, INC. 473 SILVER LANE EAST HARTFORD, CT 06118	2010	\$339,487	KEVIN WEISS 716-614-7473
INFLUENT SIPHON REPLACEMENT CONTRACT NO. 3	VILLAGE OF SPRINGVILLE P.O. BOX 17 SPRINGVILLE, NY 14141	STEARNS AND WHEELER 415 NORTH FRENCH RD, SUITE 100 AMHERST, NY 14228	2010	\$398,428	JOHN STORY 716-691-8503
COOLING TOWER REPAIR	JAMESTOWN BPU P.O. BOX 700 JAMESTOWN, NY 14702-0700	JAMESTOWN BPU P.O. BOX 700 JAMESTOWN, NY 14702-0700	2010	\$251,467	DAVID GUSTAFSON 716-661-1620

ATTACHMENT B

**SCHEDULE B
PROJECTS COMPLETED**

<u>Name, Location and Description of Project</u>	<u>Owner</u>	<u>Architect or Engineer</u>	<u>Date Completed</u>	<u>Contract Price</u>	<u>Percent with Own Forces</u>	<u>Reference/Contract Include Address and Phone</u>
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See Attached

ATTACHMENT C

SCHEDULE C
PERSONNEL

<u>Name</u>	<u>Position</u>	<u>Date Started With This Organization</u>	<u>Date Started In Construction</u>	<u>Prior Positions and Experience In Construction</u>
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See Attached

STC Construction, Inc.
Key Personnel

Mark Brammer - President and Partner

Mr. Brammer holds a B.S. degree from Michigan State University. He established STC Construction, Inc. with Carter Hollis in 1996 to further expand our specialized construction services. He manages the business, financial and employee relations aspects of the company and handles business development. His bonding, insurance, banking, accounting and human resource program management skills have solidified the company culture and provide a backbone upon which STC has based years of consistent progress within both the construction industry and the community. Mark played professional football for the Buffalo Bills for six seasons. His business intuition & human resource experience blends pragmatism with understanding. This insures both the continued financial stability and the quality of work life at STC Construction. Mark has served on the Board of Governors for the Construction Exchange of Buffalo & Western New York, Inc. and is the past President of National Contractors Insurance, Ltd as well as the past President of the American Subcontractors Association.

Jason Rice - Vice President, Partner, Project Manager

Mr. Rice holds a B.S. in Civil Engineering and a Master of Engineering in Construction Management from SUNY Buffalo. During the spring and summer of 2001 he worked for the West Valley Nuclear Services Company planning for the design and construction of the \$42 Million Design/Build project that our affiliate company built at the West Valley Demonstration Project. He joined our firm after graduation in May 2003. Jason was assisting with project planning and field change orders at the Remote Handled Waste Facility project at our West Valley job site. Currently he is managing several large projects.

Carter Hollis - Project Manager


Mr. Hollis holds degrees in Construction Engineering Technology from SUNY Alfred and a B.P.S. in Architecture from SUNY Buffalo. In 1996 Carter formed STC Construction, Inc. with Mark Brammer to better serve our growth. He has more than thirty years of bottom line construction accountability in bid and negotiated contracts. His management tools include extensive hard dollar estimating, scheduling, cost control analysis and value engineering experience. Mr. Hollis has assembled and directed large project teams of industry professionals, project managers, superintendents, schedulers, buyers and quality inspection for projects in excess of \$40 Million. His direct, comprehensive approach brings leadership to the most technologically and strategically challenging projects and success with very sophisticated and demanding clients. Carter has been on the Board of Directors of the Construction Financial Management Association (CFMA) and the Associated Builders & Contractors, Inc. (ABC).



Chuck Keipper - Project Manager


Mr. Keipper holds an A.A.S. Degree in Civil Engineering Technology from Erie Community College. He has more than thirty years of experience in all facets of the construction industry ranging from technical materials evaluations to hard dollar estimating and project management. He has extensive structural concrete experience with all types of foundation systems, earthwork, tunnel, and marine construction both in Industrial and Commercial applications. He has had full accountability for his projects with coordination of employees, multiple subcontractors and suppliers on multi-million dollar projects. Prior to joining our firm in 2000, he worked for Amherst Construction and Buffalo Industrial Diving Company. Chuck has more than twenty years experience in interfacing with owners and his direct style lends itself to complete owner involvement when desired. He managed the construction of the 43 Million Dollar Remote Handled Waste Facility for the West Valley Nuclear Services Company, completed in 2003.

Peter Ochal, Project Manager



Mr. Ochal holds a B.S. in Civil Engineering from Clarkson University. Mr. Ochal began his career during the summers of high school and college working in the field performing a variety of task from surveying, laying pipe, setting grade stakes and flagging traffic for Cold Springs Construction. After graduation from Clarkson he began as an estimator for Bell Construction out of Rochester, NY. He performed quantity take offs and ordered materials needed to sustain field operations on a number of large projects. Mr. Ochal joined our company in 1995 as an estimator for civil and mechanical projects. He gained experience by overseeing a large group of civil, mechanical and electrical tradesman on a multi-million dollar project at the West Valley Demonstration Project. His desire was to get back into field operations and over ten years ago he was made a field superintendent. Peter has a good understanding of contract specifications, budgets, and schedules with civil and mechanical applications and is computer literate. His completed projects span all facets of water and wastewater work.

Craig Lombardi – General Superintendent/Project Manager



Mr. Lombardi has more than twenty years of carpenter and carpenter foreman experience on various types of commercial and industrial projects. He joined our company in 1995 and was promoted to a superintendent in 1998. He has been directing day to day construction activities on various size projects successfully since then. This wealth of experience gives Mr. Lombardi a sound knowledge of all aspects of field work and in particular civil construction. He is conversant with interpretation of contract specifications, drawings and the sequencing of site activities. He has worked on projects for owners such as General Motors, Somerset Power Plant, Thermal Dynamics, Inc., West Valley Nuclear Services Company, and the Hanford DOE site in Washington State. He has taken many of the OSHA safety training courses, performs safety tool box talks, and has served as alternate site safety representative at our West Valley job site for the last three years. Craig has also successfully completed commercial building projects for us in Bethel, Maine; Sayreville, New Jersey; Fountain Hills, Arizona; Kennewick, Washington; Endicott, New York; and Marion, North Carolina.

Michael Allen, Superintendent

Michael Allen joined STC Construction, Inc. in June of 2008, bringing with him more than 30 years of construction experience. At that time, Mr. Allen began leading on-site construction activities at the Sturgeon Point Water Treatment Plant where we were engaged in a \$21MM modernization and rehabilitation project for the Erie County Water Authority. Prior to joining STC Construction, Mr. Allen served as general superintendent for seven years (from 2001 through 2008) at STS Construction of WNY, Inc., located in Buffalo, NY. There, he oversaw approximately \$7MM worth of work per year including supervision of up to 60 craft workers engaged in site-work and concrete foundations, concrete superstructures, concrete flatwork and post tension concrete. From 1994 through 2000, Mr. Allen served Montco Construction of Gowanda, NY as General Superintendent. Before joining Montco Construction, Mr. Allen served a number of other construction firms in capacities of carpenter, lead carpenter and carpenter foreman.

Michael J. Murphy, CSP, Safety Director

Mr. Murphy holds a B.S. degree in General Studies, with a minor in safety studies and concentrations in the natural sciences from SUNY College at Buffalo. He has forty years of full-time safety management experience. Mr. Murphy directed the safety program at Roswell Park Cancer Institute in Buffalo, New York for twenty-two years and later served as director of facilities and safety for Christ the King Seminary in East Aurora for more than five years. He has consulted for a number of government, industrial, laboratory and health care organizations, as well as for construction and environmental remediation firms and projects. After joining our firm in July of 2003, Mr. Murphy managed safety for the completion phase of our \$43,000,000 project to construct the Remote Handled Waste Facility for the West Valley Nuclear Services Company. He is authorized by OSHA to conduct 10 and 30 hour OSHA outreach/awareness safety training courses. Mr. Murphy has earned accreditation as a certified safety professional (CSP) and as a certified hazardous materials manager (CHMM).

ATTACHMENT D

**SCHEDULE D
OSHA INFORMATION**

List all Occupational Safety and Health Administration Citations for the last three years, including date, subject matter, and penalty.

NONE

NA

Attach copies of all determined Citations and Notification of Penalty, Form OSHA 2.

Describe all pending cases, giving pertinent information such as apparent violations, location of project, type of project, and present status. N/A

NA

List any additional information on the back or attach a separate sheet if necessary.

EXPERIENCE IN THE INSTALLATION OF
TAPPING SADDLES & VALVES
ON
PRESTRESSED CONCRETE CYLINDER PIPE

When this Contract includes the Installation of Tapping Saddles and Valves on Prestressed Concrete Cylinder Pipe, the Bidder is required to complete one of the following to the satisfaction of the ENGINEER:

A. I have had experience* in the above as follows:

1. _____
2. _____
3. _____

B. The above noted work will be done by a subcontractor

MARWAL CONSTRUCTION / SERGI CONSTRUCTION

Who has the following experience*:

1. ERIE COUNTY WATER AUTHORITY
2. NIAGARA COUNTY WATER AUTHORITY
3. _____

1. I will have a representative of a manufacturer of prestressed concrete cylinder pipe

HANSON PIPE & PRECAST do the above noted work.

(Insert manufacturer's name)

333 WEST FIRST ST, SUITE 700
DAYTON, OH 45401

* List size and type (SP-5 or SP-12) of main tapped along with location, year and who the work was done for.

CONTRACTING REQUIREMENTS

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

SECTION 00500

AGREEMENT

THIS AGREEMENT is dated as of the 20th day of Dec. in the year 2016, by and between the ERIE COUNTY WATER AUTHORITY (hereinafter called OWNER) and STC Construction, Inc. (hereinafter called CONTRACTOR).

WITNESSETH: OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

1.01 CONTRACTOR shall at its own cost and expense furnish all labor, services, tools, materials, equipment and incidentals necessary to complete all Work as specified or indicated in the Contract Documents to perform all specified work required for Contract NC-34, Sturgeon Point Raw Water Pump Station Improvements, in the Town of Evans. The work includes traveling water screens, sluice gates, pump discharge valves, building addition and improvements, electrical improvements, and all related work as shown on the drawings and described in the specifications. The Work is generally described in Section 011000 of the General Requirements.

ARTICLE 2 - ENGINEER

2.01 The Project has been designed by Nussbaumer & Clarke, Inc., 3556 Lake Shore Road, Suite 500, Buffalo, NY 14219 who is hereinafter called the ENGINEER. Nussbaumer & Clarke, Inc. will assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3 - CONTRACT TIMES

3.01 Time of the Essence

- A. All time limits for Milestones, if any, Substantial Completion, Final Completion and readiness for final payment as stated in the Contract Documents are of the essence.

3.02 Milestone Dates

- A. Milestone M1: The replacement of the 42" Delivered Water Transmission Main shall be completed within 45 days of the Notice to Proceed.

3.02 Days to Achieve Substantial Completion and Final Payment

- A. The Work shall be substantially completed by January 31, 2018 as provided in paragraph 2.03 of the General Conditions, and completed and ready for final payment by February 28, 2018 in accordance with paragraph 14.07 of the General Conditions.

ARTICLE 4 - LIQUIDATED AND SPECIAL DAMAGES

4.01 Liquidated Damages

- A. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and OWNER will suffer financial loss, apart from the costs described in paragraph 4.02.A, if the Work is not substantially completed within the time specified in Article 3 for Substantial Completion, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. OWNER and CONTRACTOR also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not substantially completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER:

1. \$1,000.00 for each day that expires after the date specified in Article 3 for Milestone MI (adjusted for any changes thereof made in accordance with Article 12 of the General Conditions) until Milestone MI is reached.
2. \$500.00 for each day that expires after the date specified in Article 3 for Substantial Completion (adjusted for any changes thereof made in accordance with Article 12 of the General Conditions) until the work is Substantially Complete.

4.02 Special Damages:

- A. In addition to the amount provided for liquidated damages, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and

inspection forces employed for the Work for each day that expires after the days specified in Article 3 for Substantial Completion (adjusted for any changes thereof made in accordance with Article 12 of the General Conditions) until the Work is substantially complete.

- B. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and inspection forces employed for the Work for each day that expires after the time specified in Article 3 for Work to be completed and ready for final payment (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is completed and ready for final payment.

4.03 OWNER may deduct liquidated damages and special damages as determined by the provisions of this Article 4 from progress payments due CONTRACTOR under this Agreement.

ARTICLE 5 - CONTRACT PRICE

5.01 OWNER shall pay CONTRACTOR, in current funds, for completion of the Work in accordance with the Contract Documents the prices stated in CONTRACTOR'S Bid, which Bid is attached hereto and identified as Exhibit 1 of this Agreement. As provided in paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by ENGINEER as provided in paragraph 9.08 of the General Conditions. Unit prices have been computed as provided in paragraph 11.03 of the General Conditions.

ARTICLE 6 - PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

- A. CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed as provided in the General Conditions.

6.02 Progress Payments; Retainage

- A. OWNER shall make monthly progress payments on account of the Contract Price on the basis of CONTRACTOR'S Applications for Payment as recommended by ENGINEER. CONTRACTOR'S Applications for Payment will be due on the last day of the month. All progress payments will be on the basis of the progress of the Work measured by the schedule of values provided for in paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work, based on the number of units completed and accepted) or, in the event there is no schedule of values, as provided in the General Requirements. A progress payment will not be made

whenever the value of the Work completed since the last previous progress payment is less than ten thousand dollars (\$10,000).

1. Prior to Substantial Completion
 - a. Progress payments will be made in the amount of 95 percent of the Work completed, (with the balance being retainage), less the aggregate of payments previously made and less such amounts as ENGINEER shall determine, or OWNER may withhold, in accordance with paragraph 14.02 of the General Conditions; and
 - b. 95 percent of the cost of materials and equipment not incorporated in the Work but suitably stored (with the balance being retainage).
2. Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to 100 percent of the Work completed, less such amounts as ENGINEER shall determine in accordance with paragraph 14.02.B.5 of the General Conditions and less 200 percent of ENGINEER'S estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 Final Payment:

- A. Upon final completion and acceptance of the Work in accordance with paragraph 14.07 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said paragraph 14.07.

ARTICLE 7 - INTEREST

- 7.01 All moneys not paid when due hereunder shall bear interest at the maximum rate allowed by law at the place of the Project.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 As part of the inducement for OWNER to enter into this Agreement CONTRACTOR makes the following representations:
- A. CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. CONTRACTOR has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance for the Work.
 - C. CONTRACTOR is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

- D. CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition identified at the Site, if any, which have been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.
- E. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may effect cost, progress or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto.
- F. CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies or data are necessary for the performance of the Work at the Contract Price, within the Contract Times and in accordance with the other terms and conditions of the Contract Documents.
- G. CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- I. CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.
- J. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

ARTICLE 9 - CONTRACT DOCUMENTS

9.01 The Contract Documents consist of the following:

- A. This Agreement (9 pages).
- B. Performance Bond (2 pages).

- C. Payment Bond (2 pages).
 - D. General Conditions (42 pages).
 - E. Supplementary Conditions (9 pages).
 - F. Specifications, as listed in the table of contents of the Project Manual.
 - G. Appendix A - Women and Minority Business Enterprise Policy.
 - H. Appendix B - Insurance Requirements.
 - I. Appendix C - Prevailing Wage Rate Schedule.
 - J. Appendix D – Raw Water Pump Station Crane Inspection Report.
 - K. Appendix E – Existing Sluice Gates Shop Drawings.
 - L. Appendix F – Aurora Environmental Report.
 - M. Appendix G – Shop Drawings for 42” Transmission Main.
 - N. The Drawings comprising a set entitled: Contract No: 34, Sturgeon Point Raw Water Pump Station Improvements; and including Sheets G-001 through E-602 as shown in the Sheet List Table.
 - O. Addenda consisting of Numbers 1 to 2, inclusive.
 - P. Exhibits to the Agreement enumerated as follows:
 - 1. Exhibit 1, Bid Form (9 pages).
 - Q. The following, which may be delivered or issued on or after the Effective Date of the Agreement, and are not attached hereto:
 - 1. Notice to Proceed
 - 2. Written Amendments
 - 3. Work Change Directives
 - 4. Change Order(s)
- 9.02 The documents listed in paragraph 9.01 above are attached to this Agreement (except as expressly noted otherwise above). Documents not attached are incorporated by reference. There are no Contract Documents other than those listed in this Article 9.
- 9.03 The Contract Documents may only be amended, modified or supplemented as provided in paragraph 3.04 of the General Conditions.

ARTICLE 10 - MISCELLANEOUS

10.01 Terms

- A. Terms used in this Agreement will have the meanings indicated in the General Conditions.

10.02 Assignment of Contract

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

- A. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

10.04 Severability

- A. Any provision or part of the Contract Document, held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Waiver

- A. The waiver by the OWNER of any breach or violation of any term, covenant, or condition of this Agreement or of any Law or Regulation shall not be deemed to be a waiver of any other term, covenant, condition, or Law or Regulation or of any subsequent breach or violation of the same or of any other term, covenant, condition, or Law or Regulation. The subsequent payment of any monies or fee by the OWNER which may become due hereunder shall not be deemed to be a waiver of any preceding breach or violation by CONTRACTOR of any term, covenant, condition of this Agreement or of any applicable Law or Regulation.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first written above.

This Agreement will be effective on Dec 21, 2016.

OWNER: Erie County Water Authority

CONTRACTOR: STC Construction, Inc.

By: Earl L Jann

By: [Signature], v.p.

Title: Chairman

Title: JASON C. RICE, VICE PRESIDENT

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest [Signature]

Attest [Signature]

Address for giving notices

Address for giving notices
PO BOX 459
SPRINGVILLE, NY 14141

(If OWNER is a corporation, partnership, or limited liability company, attach evidence of authority to sign) (If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Agreement.)

License No. _____
(where applicable)

Agent for service of process: _____

(If CONTRACTOR is a corporation, partnership, or limited liability company, attach evidence of authority to sign.)

Designated Representative:

Name: Earl L. Jordan

Title: Vice President

Address: 295 Main St. Rm 350

Buffalo, NY 14203

Phone No.: 716-849-8484

Fax No.: 716-849-8463

Designated Representative:

Name: JASON C. RICE

Title: VICE PRESIDENT

Address: 63 ZOAR VALLEY ROAD

SPRINGVILLE, NY 14141

Phone No.: 716-592-3400

Fax No.: 716-592-4367

END OF AGREEMENT

Performance Bond

Bond No.: 9219189
Executed in Five Counterparts

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

STC Construction, Inc.
63 Zoar Valley Road
Springville, NY 14141

SURETY (Name and Address of Principal Place of Business):

Fidelity and Deposit Company of Maryland
1299 Zurich Way
Schaumburg, IL 60196

OWNER (Name and Address):

Erie County Water Authority
295 Main Street, Room 350
Buffalo New York 14203

CONTRACT

Date: 12/01/2016

Amount: Three Million Five Hundred Twelve Thousand Five Hundred Six Dollars & 00/100 --- \$3,512,506.00

Description: **ERIE COUNTY WATER AUTHORITY**

CONTRACT NO: NC-34

STURGEON POINT

RAW WATER PUMP STATION IMPROVEMENTS

PROJECT No. 201500175

BOND

Date (Not earlier than Contract Date): 12/12/2016

Amount: Three Million Five Hundred Twelve Thousand Five Hundred Six Dollars & 00/100 --- \$3,512,506.00

Modifications to this Bond Form: None

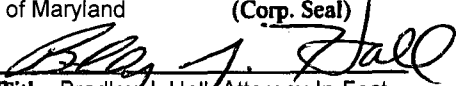
Surety and CONTRACTOR, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

CONTRACTOR AS PRINCIPAL

Company: STC Construction, Inc. (Corp. Seal)

Signature: 
Name and Title: Mark D. Brammer, President

SURETY Fidelity and Deposit Company
Company: of Maryland (Corp. Seal)

Signature: 
Name and Title: Bradley J. Hall, Attorney-In-Fact
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company: _____ (Corp. Seal)

Signature: _____
Name and Title: _____

SURETY

Company: _____ (Corp. Seal)

Signature: _____
Name and Title: _____

EJCDC No. 1910-28-A (1996 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER for the performance of the Contract, which is incorporated herein by reference.

2. If the CONTRACTOR performs the Contract, the Surety and the CONTRACTOR have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

3. If there is no OWNER Default, the Surety's obligation under this Bond shall arise after:

3.1. The OWNER has notified the CONTRACTOR and the Surety at the addresses described in paragraph 10 below, that the OWNER is considering declaring a CONTRACTOR Default and has requested and attempted to arrange a conference with the CONTRACTOR and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Contract. If the OWNER, the CONTRACTOR and the Surety agree, the CONTRACTOR shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the OWNER'S right, if any, subsequently to declare a CONTRACTOR Default; and

3.2. The OWNER has declared a CONTRACTOR Default and formally terminated the CONTRACTOR'S right to complete the Contract. Such CONTRACTOR Default shall not be declared earlier than twenty days after the CONTRACTOR and the Surety have received notice as provided in paragraph 3.1; and

3.3. The OWNER has agreed to pay the Balance of the Contract Price to:

3.3.1. The Surety in accordance with the terms of the Contract; or

3.3.2. Another contractor selected pursuant to paragraph 4.3 to perform the Contract.

4. When the OWNER has satisfied the conditions of paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Contract; or

4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER'S concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the OWNER the amount of damages as described in paragraph 6 in excess of the Balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR Default; or

4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances;

4.4.1. After investigation, determine the amount for which it may be liable to the OWNER and, as soon as practicable after the amount is determined, tender payment therefor to the OWNER; or

4.4.2. Deny liability in whole or in part and notify the OWNER citing reasons therefor.

5. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the OWNER to the Surety demanding that the Surety perform its obligations under this Bond, and the OWNER shall be entitled to enforce any remedy available to the OWNER. If the Surety proceeds as provided in paragraph 4.4, and the OWNER refuses the payment tendered or the Surety has denied liability, in whole or in part, without

further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.

6. After the OWNER has terminated the CONTRACTOR'S right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the OWNER shall not be greater than those of the CONTRACTOR under the Contract, and the responsibilities of the OWNER to the Surety shall not be greater than those of the OWNER under the Contract. To a limit of the amount of this Bond, but subject to commitment by the OWNER of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:

6.1. The responsibilities of the CONTRACTOR for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional and delay costs resulting from the CONTRACTOR'S Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the CONTRACTOR.

7. The Surety shall not be liable to the OWNER or others for obligations of the CONTRACTOR that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the OWNER or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after CONTRACTOR Default or within two years after the CONTRACTOR ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here-from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by the OWNER to the CONTRACTOR under the Contract after all proper adjustments have been made, including allowance to the CONTRACTOR of any amounts received or to be received by the OWNER in settlement of insurance or other Claims for damages to which the CONTRACTOR is entitled, reduced by all valid and proper payments made to or on behalf of the CONTRACTOR under the Contract.

12.2. Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

12.3. CONTRACTOR Default: Failure of the CONTRACTOR, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the Contract or to perform and complete or comply with the other terms thereof.

(FOR INFORMATION ONLY - Name, Address and Telephone)
AGENT or BROKER: OWNER'S REPRESENTATIVE (Engineer):

Lawley Agency, LLC
361 Delaware Ave., Buffalo, NY 14202
(716) 849-1577

ACKNOWLEDGMENT OF PRINCIPAL

STATE OF New York)
) SS.:
COUNTY OF Erie)

On the ~~13th~~ day of December in the year 2016, before me, the undersigned, personally appeared Mark D. Brammer, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

Tamara L. Collins

Notary Public

ACKNOWLEDGMENT OF SURETY

STATE OF New York)
) SS.:
COUNTY OF Erie)

TAMARA L COLLINS
Notary Public, State of New York
01CO6259368
Qualified in Erie County
My Commission Expires April 9, 2020

On the 12th day of December in the year 2016, before me, the undersigned, personally appeared Bradley J. Hall, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same in his/her capacity, and that by his/her signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

[Signature]
Notary Public

ALISSA J WOLF
Notary Public, State of New York
No. 01WO6284714
Qualified in Erie County
Commission Expires June 24, 2017

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **MICHAEL BOND, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Christopher D. ROSS, Victoria RIVERA, Bradley J. HALL, Colleen A. KENDZIORA, Timothy M. TOOLE, Lori A. FAY and Alissa J. WOLF, all of Buffalo, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 26th day of May, A.D. 2016.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Eric D. Barnes*
Eric D. Barnes
Secretary
Eric D. Barnes

Michael Bond
Michael Bond
Vice President
Michael Bond

State of Maryland
County of Baltimore

On this 26th day of May, A.D. 2016, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **MICHAEL BOND, Vice President, and ERIC D. BARNES, Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposed and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski



Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2019

EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this 15th day of December 2016.



Gerald F. Haley

Gerald F. Haley, Vice President

FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

Statement of Financial Condition

As Of December 31, 2015

ASSETS

Bonds	\$ 142,878,497
Stocks	22,315,096
Cash and Short Term Investments.....	337,835
Reinsurance Recoverable	24,731,651
Other Accounts Receivable.....	19,935,844
TOTAL ADMITTED ASSETS	\$ 210,198,923

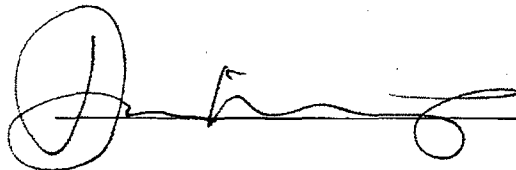
LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses.....	\$ 46,436
Ceded Reinsurance Premiums Payable	40,456,309
Securities Lending Collateral Liability	0
TOTAL LIABILITIES	\$ 40,502,745
Capital Stock, Paid Up	\$ 5,000,000
Surplus	164,696,178
Surplus as regards Policyholders.....	169,696,178
TOTAL	\$ 210,198,923

Securities carried at \$57,996,983 in the above statement are deposited with various states as required by law.

Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of market quotations for all bonds and stocks owned, the Company's total admitted assets at December 31, 2015 would be \$212,137,795 and surplus as regards policyholders \$171,635,049.

I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2015.

 _____
Corporate Secretary

State of Illinois }
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2016.

 _____
Notary Public



Payment Bond

Bond No.: 9219189
Executed in Five Counterparts

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

STC Construction, Inc.
63 Zoar Valley Road
Springville, NY 14141

SURETY (Name and Address of Principal Place

of Business): Fidelity And Deposit Company of Maryland
1299 Zurich Way
Schaumburg, IL 60196

OWNER (Name and Address):

Erie County Water Authority
295 Main Street, Room 350
Buffalo New York 14203

CONTRACT

Date: 12/01/2016
Amount: Three Million Five Hundred Twelve Thousand Five Hundred Six Dollars & 00/100 --- \$3,512,506.00
Description: **ERIE COUNTY WATER AUTHORITY**
CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT No. 201500175

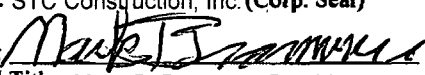
BOND

Date (Not earlier than Contract Date): 12/12/2016
Amount: Three Million Five Hundred Twelve Thousand Five Hundred Six Dollars & 00/100 --- \$3,512,506.00
Modifications to this Bond Form: None

Surety and CONTRACTOR, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

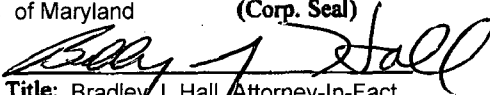
CONTRACTOR AS PRINCIPAL

Company: STC Construction, Inc. (Corp. Seal)

Signature: 
Name and Title: Mark D. Brammer, President

SURETY Fidelity and Deposit Company

Company: of Maryland (Corp. Seal)

Signature: 
Name and Title: Bradley J. Hall, Attorney-In-Fact
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company: _____ (Corp. Seal)

Signature: _____
Name and Title: _____

SURETY

Company: _____ (Corp. Seal)

Signature: _____
Name and Title: _____

EJCDC No. 1910-28-B (1996 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, the American Institute of Architects, the American Subcontractors Association, and the Associated Specialty Contractors.

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **MICHAEL BOND, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Christopher D. ROSS, Victoria RIVERA, Bradley J. HALL, Colleen A. KENDZIORA, Timothy M. TOOLE, Lori A. FAY and Alissa J. WOLF, all of Buffalo, New York, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 26th day of May, A.D. 2016.

ATTEST:

**ZURICH AMERICAN INSURANCE COMPANY
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Eric D. Barnes*
Secretary
Eric D. Barnes

Michael Bond
Vice President
Michael Bond

State of Maryland
County of Baltimore

On this 26th day of May, A.D. 2016, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **MICHAEL BOND, Vice President, and ERIC D. BARNES, Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposed and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

Maria D. Adamski



Maria D. Adamski, Notary Public
My Commission Expires: July 8, 2019

EXTRACT FROM BY-LAWS OF THE COMPANIES

"Article V, Section 8, Attorneys-in-Fact. The Chief Executive Officer, the President, or any Executive Vice President or Vice President may, by written instrument under the attested corporate seal, appoint attorneys-in-fact with authority to execute bonds, policies, recognizances, stipulations, undertakings, or other like instruments on behalf of the Company, and may authorize any officer or any such attorney-in-fact to affix the corporate seal thereto; and may with or without cause modify or revoke any such appointment or authority at any time."

CERTIFICATE

I, the undersigned, Vice President of the ZURICH AMERICAN INSURANCE COMPANY, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing Power of Attorney is still in full force and effect on the date of this certificate; and I do further certify that Article V, Section 8, of the By-Laws of the Companies is still in force.

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the ZURICH AMERICAN INSURANCE COMPANY at a meeting duly called and held on the 15th day of December 1998.

RESOLVED: "That the signature of the President or a Vice President and the attesting signature of a Secretary or an Assistant Secretary and the Seal of the Company may be affixed by facsimile on any Power of Attorney...Any such Power or any certificate thereof bearing such facsimile signature and seal shall be valid and binding on the Company."

This Power of Attorney and Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at a meeting duly called and held on the 5th day of May, 1994, and the following resolution of the Board of Directors of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at a meeting duly called and held on the 10th day of May, 1990.

RESOLVED: "That the facsimile or mechanically reproduced seal of the company and facsimile or mechanically reproduced signature of any Vice-President, Secretary, or Assistant Secretary of the Company, whether made heretofore or hereafter, wherever appearing upon a certified copy of any power of attorney issued by the Company, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seals of the said Companies, this 15th day of December, 2016.



Gerald F. Haley

Gerald F. Haley, Vice President

FIDELITY AND DEPOSIT COMPANY

OF MARYLAND

600 Red Brook Blvd., Suite 600, Owings Mills, MD 21117

Statement of Financial Condition

As Of December 31, 2015

ASSETS

Bonds	\$ 142,878,497
Stocks	22,315,096
Cash and Short Term Investments	337,835
Reinsurance Recoverable	24,731,651
Other Accounts Receivable	19,935,844
TOTAL ADMITTED ASSETS	\$ 210,198,923

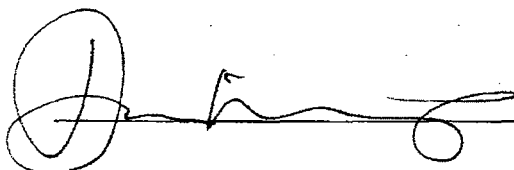
LIABILITIES, SURPLUS AND OTHER FUNDS

Reserve for Taxes and Expenses	\$ 46,436
Ceded Reinsurance Premiums Payable	40,456,309
Securities Lending Collateral Liability	0
TOTAL LIABILITIES	\$ 40,502,745
Capital Stock, Paid Up	\$ 5,000,000
Surplus	164,696,178
Surplus as regards Policyholders	169,696,178
TOTAL	\$ 210,198,923

Securities carried at \$57,996,983 in the above statement are deposited with various states as required by law.

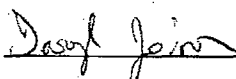
Securities carried on the basis prescribed by the National Association of Insurance Commissioners. On the basis of market quotations for all bonds and stocks owned, the Company's total admitted assets at December 31, 2015 would be \$212,137,795 and surplus as regards policyholders \$171,635,049.

I, DENNIS F. KERRIGAN, Corporate Secretary of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND, do hereby certify that the foregoing statement is a correct exhibit of the assets and liabilities of the said Company on the 31st day of December, 2015.


Corporate Secretary

State of Illinois }
City of Schaumburg } SS:

Subscribed and sworn to, before me, a Notary Public of the State of Illinois, in the City of Schaumburg, this 15th day of March, 2016.


Notary Public



ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT
RAW WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

SECTION 00700

GENERAL CONDITIONS

Adapted with permission from Standard General Conditions of the
Construction Contract, EJCDC No. 1910-8 (1996 Edition).

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between OWNER and CONTRACTOR covering the Work.

3. *Application for Payment*--The form acceptable to ENGINEER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

7. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.

8. *Bonds*--Performance and payment bonds and other instruments of security.

9. *Change Order*--A document recommended by ENGINEER which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract

Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER'S written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.

13. *Contract Price*--The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by ENGINEER'S written recommendation of final payment.

15. *CONTRACTOR*--The individual or entity with whom OWNER has entered into the Agreement.

16. *Cost of the Work*--See paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by ENGINEER which graphically shows the scope, extent, and character of the Work to be performed by CONTRACTOR. Shop Drawings and other CONTRACTOR submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *ENGINEER*--The individual or entity named as such in the Agreement.

20. *ENGINEER'S Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

21. *Field Order*--A written order issued by ENGINEER which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

22. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

23. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

24. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

25. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

27. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

28. *Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.

29. *Notice to Proceed*--A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform the Work under the Contract Documents.

30. *OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.

31. *Partial Utilization*--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

32. *PCBs*--Polychlorinated biphenyls.

33. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

34. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

35. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

36. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

37. *Resident Project Representative*--The authorized representative of ENGINEER who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

40. *Site*--Lands or areas indicated in the Contract Documents as being furnished by OWNER upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by OWNER which are designated for the use of CONTRACTOR.

41. *Specifications*--That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

42. *Subcontractor*--An individual or entity having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the Site.

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

44. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

45. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

46. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

47. *Unit Price Work*--Work to be paid for on the basis of unit prices.

48. *Work*--The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

49. *Work Change Directive*--A written statement to CONTRACTOR issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

50. *Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

1.02 Terminology

A. Intent of Certain Terms or Adjectives

1. Whenever in the Contract Documents the terms “as ordered,” “as directed,” “as required,” “as allowed,” “as approved,” or terms of like effect or import are used to authorize an exercise of professional judgment by the ENGINEER, or the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the Work, it is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.10 or any other provision of the Contract Documents.

B. Day

1. The word “day” shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

C. Defective

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER’S recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.04 or 14.05).

D. Furnish, Install, Perform, Provide

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified

location) ready for use or installation and in usable or operable condition.

2. The word *Install*, when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, “provide” is implied.

E. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 Delivery of Bonds

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.

2.02 Copies of Documents

A. OWNER shall furnish to CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *CONTRACTOR'S Review of Contract Documents:* Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless CONTRACTOR knew or reasonably should have known thereof.

B. *Preliminary Schedules:* Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:

1. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and
3. a preliminary schedule of values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

C. *Evidence of Insurance:* Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are

required to purchase and maintain in accordance with Article 5.

2.06 *Preconstruction Conference*

A. Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER, as provided below, the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER.

1. The progress schedule will be acceptable to ENGINEER if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on ENGINEER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR'S full responsibility therefor.

2. CONTRACTOR'S schedule of Shop Drawing and Sample submittals will be acceptable to ENGINEER if it provides a workable arrangement for reviewing and processing the required submittals.

3. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT,
AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.

C. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in Article 9.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws, and Regulations*

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER'S Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as required by paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the

following ways: (i) a Field Order; (ii) ENGINEER'S approval of a Shop Drawing or Sample; or (iii) ENGINEER'S written interpretation or clarification.

3.05 *Reuse of Documents*

A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER'S Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaption by ENGINEER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER'S furnishing the Site, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

B. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER, or any of ENGINEER'S Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR'S purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *ENGINEER'S Review:* After receipt of written notice as required by paragraph 4.03.A, ENGINEER will promptly review the pertinent condition, determine the necessity of OWNER'S obtaining additional exploration or tests with respect thereto, and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER'S findings and conclusions.

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in CONTRACTOR'S cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 and 11.03.

2. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and

contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR'S making such final commitment; or

c. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.03.A.

3. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER'S Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities, including OWNER, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, CONTRACTOR shall be responsible for the safety and protection of the underground facility.

2. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown with reasonable accuracy in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, OWNER or CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

4.05 *Reference Points*

A. OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER'S judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of

such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data", CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER or any of ENGINEER'S Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR'S purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.

D. If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such

condition and in any area affected thereby (except in an emergency as required by paragraph 6.16); and (iii) notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. CONTRACTOR shall not be required to resume Work in connection with such condition or in any affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, either party may make a Claim therefor as provided in paragraph 10.05.

F. If, after receipt of such written notice, CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER'S Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.G shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR'S obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.

B. All Bonds shall be in the form prescribed by the Contract Documents, except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

C. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.01.B, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.

5.02. *Licensed Sureties and Insurers*

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.

5.04 *CONTRACTOR'S Liability Insurance*

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR'S performance of the Work and CONTRACTOR'S other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR'S employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR'S employees;
4. claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:

1. with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER'S Consultants, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering CONTRACTOR'S indemnity obligations under paragraphs 6.07, 6.11, and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR pursuant to paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing, or replacing defective Work in accordance with paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

5.05 *OWNER'S Liability Insurance*

A. In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.04, OWNER, at OWNER=s option, may purchase and maintain at OWNER'S expense OWNER'S own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance (See Supplementary Conditions)*

5.07 (Not Used)

5.08 (Not Used)

5.09 (Not Used)

5.10 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the

means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of OWNER or ENGINEER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR'S representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

6.02 *Labor; Working Hours*

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER=s written consent (which will not be unreasonably withheld) given after prior written notice to ENGINEER.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the General Requirements, CONTRACTOR shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly

run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to ENGINEER for review under the circumstances described below.

1. *"Or-Equal" Items:* If, in ENGINEER'S sole discretion, an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER'S sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute

items. For the purposes of this paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. In the exercise of reasonable judgment ENGINEER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole; and CONTRACTOR;

b. Certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items*

a. If, in ENGINEER'S sole discretion, an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR.

c. The procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.

d. CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR'S achievement of Substantial Completion on time, whether or not use of the proposed substitute item

in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER'S sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.05.A.2.

C. Engineer's Evaluation: ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.05.A and 6.05.B. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until ENGINEER'S review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." ENGINEER will advise CONTRACTOR in writing of any negative determination.

D. Special Guarantee: OWNER may require CONTRACTOR to furnish at CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute.

E. ENGINEER'S Cost Reimbursement: ENGINEER will record time required by ENGINEER and

ENGINEER'S Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER'S Consultants for evaluating each such proposed substitute.

F. CONTRACTOR'S Expense: CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR'S expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to OWNER in advance for acceptance by OWNER by a specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER'S acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

C. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or

entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR'S own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.

E. CONTRACTOR shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with ENGINEER through CONTRACTOR.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER'S Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

6.07 *Patent Fees and Royalties*

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER'S Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 *Laws and Regulations*

A. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR'S compliance with any Laws or Regulations.

B. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be CONTRACTOR'S primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR'S obligations under paragraph 3.03.

6.10 Taxes

A. CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas

1. CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER'S Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against OWNER,

ENGINEER, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR'S performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work CONTRACTOR shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work, CONTRACTOR shall clean the Site and make it ready for utilization by OWNER. At the completion of the Work CONTRACTOR shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 Record Documents

A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents, together with all approved Samples and a counterpart of all approved Shop Drawings, will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.

6.13 Safety and Protection

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

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to in paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER'S Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR'S duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be

made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR is obligated to act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the services, materials, and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.17.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, any related Work performed prior to ENGINEER'S review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

D. *Submittal Procedures*

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR'S obligations under the Contract Documents with respect to CONTRACTOR'S review and approval of that submittal.

3. At the time of each submittal, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

E. *ENGINEER'S Review*

1. ENGINEER will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER. ENGINEER'S review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a

functioning whole as indicated by the Contract Documents.

2. ENGINEER'S review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. ENGINEER'S review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER'S attention to each such variation at the time of each submittal as required by paragraph 6.17.D.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.

F. *Resubmittal Procedures:*

1. CONTRACTOR shall make corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

6.18 *Continuing the Work*

A. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.04 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.19 *CONTRACTOR'S General Warranty and Guarantee*

A. CONTRACTOR warrants and guarantees to OWNER, ENGINEER, and ENGINEER'S Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR'S

warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity for whom CONTRACTOR is responsible; or
2. normal wear and tear under normal usage.

B. CONTRACTOR'S obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR'S obligation to perform the Work in accordance with the Contract Documents:

1. observations by ENGINEER;
2. recommendation by ENGINEER or payment by OWNER of any progress or final payment;
3. the issuance of a certificate of Substantial Completion by ENGINEER or any payment related thereto by OWNER;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any acceptance by OWNER or any failure to do so;
6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;
7. any inspection, test, or approval by others; or
8. any correction of defective Work by OWNER.

6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER'S Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:

1. is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of real or personal property (other than the Work itself), including the loss of use resulting therefrom; and

2. is caused in whole or in part by any act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws or Regulations.

B. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not be limited in any way by the amount or types of insurance provided by CONTRACTOR under Article 5 of the General Conditions.

D. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the sole negligence or willful misconduct of OWNER, ENGINEER or ENGINEER'S Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

ARTICLE 7 - OTHER WORK

7.01 Related Work at Site

A. OWNER may perform other work related to the Project at the Site by OWNER'S employees, or let other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to CONTRACTOR prior to starting any such other work; and

2. if OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in paragraph 10.05.

B. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the other work with OWNER'S employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

C. If the proper execution or results of any part of CONTRACTOR'S Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR'S Work. CONTRACTOR'S failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR'S Work except for latent defects and deficiencies in such other work.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.02 *Furnish Data*

A. OWNER shall promptly furnish the data required of OWNER under the Contract Documents.

8.03 *Pay Promptly When Due*

A. OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.

8.04 *Lands and Easements; Reports and Tests*

A. OWNER'S duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.01 and 4.05. Paragraph 4.02 refers to OWNER'S identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by ENGINEER in preparing the Contract Documents.

8.05 *Insurance*

A. OWNER'S responsibilities, if any, in respect of purchasing and maintaining liability and property insurance are set forth in Article 5.

8.06 *Change Orders*

A. OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.

8.07. *Inspections, Tests, and Approvals*

A. OWNER'S responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.03.B.

8.08 *Limitations on OWNER'S Responsibilities*

A. The OWNER shall not supervise, direct, or have control or authority over, nor be responsible for, CONTRACTOR'S means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any

failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. OWNER will not be responsible for CONTRACTOR'S failure to perform the Work in accordance with the Contract Documents.

8.09 *Undisclosed Hazardous Environmental Condition*

A. OWNER'S responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in paragraph 4.06.

8.10 *Evidence of Financial Arrangements*

A. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER'S obligations under the Contract Documents, OWNER'S responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *OWNER'S Representative*

A. ENGINEER will be OWNER'S representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER'S representative during construction are set forth in the Contract Documents and will not be changed without written consent of OWNER and ENGINEER.

9.02 *Visits to Site*

A. ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR'S executed Work. Based on information obtained during such visits and observations, ENGINEER, for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER'S efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress

of the Work and will endeavor to guard OWNER against defective Work.

B. ENGINEER'S visits and observations are subject to all the limitations on ENGINEER'S authority and responsibility set forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER'S visits or observations of CONTRACTOR'S Work. ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR'S means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not ENGINEER'S Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Clarifications and Interpretations*

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.

9.05 *Authorized Variations in Work*

A. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be

accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR, who shall perform the Work involved promptly. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made therefor as provided in paragraph 10.05.

9.06 *Rejecting Defective Work*

A. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, or that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the Work as provided in paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.07 *Shop Drawings, Change Orders and Payments*

A. In connection with ENGINEER'S authority as to Shop Drawings and Samples, see paragraph 6.17.

B. In connection with ENGINEER'S authority as to Change Orders, see Articles 10, 11, and 12.

C. In connection with ENGINEER'S authority as to Applications for Payment, see Article 14.

9.08 *Determinations for Unit Price Work*

A. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR the ENGINEER'S preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER'S written decision thereon will be final and binding (except as modified by ENGINEER to reflect changed factual conditions or more accurate data) upon OWNER and CONTRACTOR, subject to the provisions of paragraph 10.05.

9.09 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the

interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 *Limitations on ENGINEER'S Authority and Responsibilities*

A. Neither ENGINEER'S authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by ENGINEER shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR'S means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. ENGINEER will not be responsible for CONTRACTOR'S failure to perform the Work in accordance with the Contract Documents.

C. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. ENGINEER'S review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules,

guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this paragraph 9.10 shall also apply to ENGINEER'S Consultants, Resident Project Representative, and assistants.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in paragraph 3.04, except in the case of an emergency as provided in paragraph 6.16 or in the case of uncovering Work as provided in paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

1. changes in the Work which are: (i) ordered by OWNER pursuant to paragraph 10.01.A, (ii) required because of acceptance of defective Work under para-

graph 13.08.A or OWNER'S correction of defective Work under paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR'S responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

10.05 *Claims and Disputes*

A. *Notice:* Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to ENGINEER and the other party to the Contract promptly (but in no event later than 20 days) after the start of the event giving rise thereto. Notice of the amount or extent of the Claim, dispute, or other matter with supporting data shall be delivered to the ENGINEER and the other party to the Contract within 45 days after the start of such event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to ENGINEER and the claimant

within 30 days after receipt of the claimant's last submittal (unless ENGINEER allows additional time).

B. *ENGINEER'S Decision*: ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER'S written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER'S decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER'S written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included*: The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the

costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

3. Payments made by CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER, who will then determine, with the advice of ENGINEER, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR'S

Cost of the Work and fee as provided in this paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of CONTRACTOR'S employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of CONTRACTOR.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with

paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR'S fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage, and similar petty cash items in connection with the Work.

i. When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.

j. When all the Work is performed on the basis of cost-plus, the costs of premiums for all Bonds and insurance CONTRACTOR is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR'S principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the CONTRACTOR'S fee.

2. Expenses of CONTRACTOR'S principal and branch offices other than CONTRACTOR'S office at the Site.

3. Any part of CONTRACTOR'S capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraphs 11.01.A and 11.01.B.

C. *CONTRACTOR'S Fee:* When all the Work is performed on the basis of cost-plus, CONTRACTOR'S fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, CONTRACTOR'S fee shall be determined as set forth in paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to paragraphs 11.01.A and 11.01.B, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

11.02 *Cash Allowances*

A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. CONTRACTOR'S costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER subject to the provisions of paragraph 9.08.

B. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

C. For provisions for an adjustment of a unit price for an increase or decrease in the quantity of Unit Price Work, if any, see General Requirements Section 01270, Measurement and Payment.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in paragraph 11.01) plus a CONTRACTOR'S fee for overhead and profit (determined as provided in paragraph 12.01.C).

C. *CONTRACTOR'S Fee*: The CONTRACTOR'S fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under paragraphs 11.01.A.1 and 11.01.A.2, the CONTRACTOR'S fee shall be 15 percent;

b. for costs incurred under paragraph 11.01.A.3, the CONTRACTOR'S fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR'S fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in

CONTRACTOR'S fee shall be computed on the basis of the net change in accordance with paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. Any adjustment of the Contract Times (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article 12.

12.03 *Delays Beyond CONTRACTOR'S Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

12.04 *Delays Within CONTRACTOR'S Control*

A. The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.05 *Delays Beyond OWNER'S and CONTRACTOR'S Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR'S sole and exclusive remedy for such delay.

12.06 *Delay Damages*

A. In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR; or

2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

B. Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which OWNER or ENGINEER has actual knowledge will be given to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. OWNER, ENGINEER, ENGINEER's Consultants, other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR'S Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with

inspection and testing personnel to facilitate required inspections or tests.

B. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B shall be paid as provided in said paragraph 13.04.B; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection or approval.

D. CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER'S and ENGINEER'S acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR'S purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to OWNER and ENGINEER.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

F. Uncovering Work as provided in paragraph 13.03.E shall be at CONTRACTOR'S expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR'S intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by

ENGINEER, be uncovered for ENGINEER'S observation and replaced at CONTRACTOR'S expense.

B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER'S request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

13.05 *OWNER May Stop the Work*

A. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by ENGINEER, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees

and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR'S use by OWNER or permitted by Laws and Regulations as contemplated in paragraph 6.11.A is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER'S written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

D. CONTRACTOR'S obligations under this paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER'S recommendation of final payment, ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to OWNER'S evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by CONTRACTOR pursuant to this sentence. If any such acceptance occurs prior to ENGINEER'S recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and OWNER shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

13.09 *OWNER May Correct Defective Work*

A. If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.06.A, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work and suspend CONTRACTOR'S services related thereto, take possession of CONTRACTOR'S tools, appliances, construction equipment and machinery at the Site, and

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incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER'S representatives, agents and employees, OWNER'S other contractors, and ENGINEER and ENGINEER'S Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.

C. All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by OWNER in exercising the rights and remedies under this paragraph 13.09 will be charged against CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, OWNER may make a Claim therefor as provided in paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of CONTRACTOR'S defective Work.

D. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER'S rights and remedies under this paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The schedule of values established as provided in paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

1. At least 10 days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the

Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER'S interest therein, all of which must be satisfactory to OWNER.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied on account to discharge CONTRACTOR'S legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. ENGINEER will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER or return the Application to CONTRACTOR indicating in writing ENGINEER'S reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

2. ENGINEER'S recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER'S observations on the Site of the executed Work as an experienced and qualified design professional and on ENGINEER'S review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER'S knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the

Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.08, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to CONTRACTOR'S being entitled to such payment appear to have been fulfilled in so far as it is ENGINEER'S responsibility to observe the Work.

3. By recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

4. Neither ENGINEER'S review of CONTRACTOR'S Work for the purposes of recommending payments nor ENGINEER'S recommendation of any payment, including final payment, will impose responsibility on ENGINEER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR'S failure to comply with Laws and Regulations applicable to CONTRACTOR'S performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.

5. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER'S opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.02.B.2. ENGINEER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in ENGINEER'S opinion to protect OWNER from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Written Amendment or Change Orders;

c. OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.09; or

d. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A.

C. *Payment Becomes Due*

1. Sixty days after presentation of the Application for Payment to OWNER with ENGINEER'S recommendation, the amount recommended will (subject to the provisions of paragraph 14.02.D) become due, and when due will be paid by OWNER to CONTRACTOR.

D. *Reduction in Payment*

1. OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

a. claims have been made against OWNER on account of CONTRACTOR'S performance or furnishing of the Work;

b. liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens;

c. there are other items entitling OWNER to a set-off against the amount recommended; or

d. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.B.5.a through 14.02.B.5.c or paragraph 15.02.A.

2. If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld. OWNER shall promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and

CONTRACTOR, when CONTRACTOR corrects to OWNER'S satisfaction the reasons for such action.

3. If it is subsequently determined that OWNER'S refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by paragraph 14.02.C.1.

14.03 *CONTRACTOR'S Warranty of Title*

A. CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER'S objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR

with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER'S issuing the definitive certificate of Substantial Completion, ENGINEER'S aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Use by OWNER at OWNER'S option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR'S performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of

the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of the Supplementary Conditions regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment*

1. After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in paragraph 6.12), and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in paragraph 14.07.A.2 and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER'S property might in any way be responsible have been

paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

B. Review of Application and Acceptance

1. If, on the basis of ENGINEER'S observation of the Work during construction and final inspection, and ENGINEER'S review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR'S other obligations under the Contract Documents have been fulfilled, ENGINEER will, within 10 days after receipt of the final Application for Payment, indicate in writing ENGINEER'S recommendation of payment and present the Application for Payment to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.09. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Sixty days after the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.

D. Final Completion Delayed

1. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR'S final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment

shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.08 *(Not Used)*

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR'S continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *OWNER May Suspend Work*

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim therefor as provided in paragraph 10.05.

15.02 *OWNER May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR'S persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);

2. CONTRACTOR'S disregard of Laws or Regulations of any public body having jurisdiction;

3. CONTRACTOR'S disregard of the authority of ENGINEER; or

4. CONTRACTOR'S violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR'S tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and, when so approved by ENGINEER, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

C. Where CONTRACTOR'S services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.03 *OWNER May Terminate For Convenience*

A. Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. for all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. for reasonable expenses directly attributable to termination.

B. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *CONTRACTOR May Stop Work or Terminate*

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 60 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided in paragraph 15.03. In lieu of terminating the Contract and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 60 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may, seven days after written notice to OWNER and ENGINEER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.04 are not intended to preclude CONTRACTOR from making a Claim under paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly

attributable to CONTRACTOR'S stopping the Work as permitted by this paragraph.

applicable jurisdiction, such day will be omitted from the computation.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Agreement.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. The Article and paragraph headings are inserted for convenience only and do not constitute part of these General Conditions.

END OF GENERAL CONDITIONS

ERIE COUNTY WATER AUTHORITY
BUFFALO, NEW YORK

CONTRACT NO: NC-34
STURGEON POINT RAW
WATER PUMP STATION IMPROVEMENTS
PROJECT NO: 201500175

SECTION 00800

SUPPLEMENTARY CONDITIONS

SCOPE

These Supplementary Conditions amend or supplement the General Conditions. All provisions of the General Conditions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

SC-1.01.A.7. Modify paragraph 1.01.A.7. by changing the word "Advertisement" in the first sentence to "Notice".

SC-1.01.A.43 Add the following to Paragraph 1.01.A.43:

"Substantial Completion is defined as the time at which all work is complete and all equipment has successfully completed the Performance Tests as specified in Section 019100, Commissioning."

SC-4.02 Add new paragraph immediately after paragraph 4.02.B which is to read as follows:

SC-4.02.C In the preparation of the Drawings and Specifications, ENGINEER has relied upon:

The following records of explorations and tests of subsurface conditions at the Site:

- a. Geotechnical Evaluation Report for Proposed Raw Water Pump Station Improvements dated June 15, 2016, prepared by Empire Geo Services, Inc.
- b. Geotechnical Evaluation Report for Proposed Residuals Pump Station Improvements dated May 12, 2014, prepared by Empire Geo Services, Inc.
- c. Soil boring logs, Sturgeon Point Project, Filtration Plant, Buck, Siefert and Jost, April, 1958.
- d. Soil boring logs, Sturgeon Point Project, Intake and Intake Tunnel, Buck, Siefert and Jost, May, 1958.

The following drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the Site:

- a. Sturgeon Point Project Filtration Plant, Buck, Seifert and Jost, April, 1958.
- b. Sturgeon Point Project Intake and Intake Tunnel, buck, Siefert and Jost, May, 1958.
- c. Sturgeon Point Project Additions, Malcolm Pirnie, Inc., September, 1966.
- d. Contract No. 14 Sturgeon Point Projects, Malcolm Pirnie, April, 1971.
- e. Contract No. 16A and 16B Sturgeon Point Filtration Plant Expansion, Malcolm Pirnie, April, 1972.
- f. Contract No. MP-66A Sturgeon Point Storage Tanks and 42-inch Pipeline, Malcolm Pirnie, March, 1997.
- g. Contract NC-23 Sturgeon Point Water Treatment Plant Raw Water Pump Station Modifications, Nussbaumer & Clarke, Inc., August, 2002
- h. Contract R-12B Sturgeon Point Treatment Plant, Zebra Mussel Control System, R&D Engineers, 1991.
- i. Contract GHD-6C Sturgeon Point Treatment Plant Residuals System Improvements, GHD Engineers, 2015.
- j. Erie County Water Authority Sturgeon Point Water Treatment Plant Electrical Service Operating Diagrams, 2015.

The following records of testing for hazardous material conditions at the Site:

- a. Pre-renovation Asbestos Inspection dated October 7, 2015, prepared by Aurora Environmental, LLC.

Copies of the reports and drawings listed are available for review at the office of Nussbaumer & Clarke, Inc. at 3556 Lake Shore Road, Suite 500, Buffalo, NY 14219, upon 48 hours notice.

SC-4.06.A Add a new paragraph immediately after paragraph 4.06.A which is to read as follows:

SC-4.06.A.1 In the preparation of the Drawings and Specifications, ENGINEER did not utilize any report or drawing related to a Hazardous Environmental Condition identified at the Site except as identified in SC-4.02.

SC-5.01.A Modify the first part of the second sentence of paragraph 5.01.A of the General Conditions to read:

The payment Bond shall remain in effect for one year and the performance Bond shall remain in effect for two years after....

SC-5.04 through 5.10. Delete paragraph 5.04 through 5.10, inclusive, in their entirety.

SC-5.03 Add a new paragraph immediately after Paragraph 5.03, which is to read as follows:

“SC-5.04 *Insurance Requirements*

A. CONTRACTOR shall procure and maintain insurance in accordance with Insurance Requirements, as set forth in the attached Appendix B and hereby made a part of these General Conditions.”

SC-6.02.B Add new paragraphs immediately after paragraph 6.02.B which are to read as follows:

“SC-6.02.B.1 Except where otherwise prohibited by Laws or Regulations, regular working hours are defined as up to 8 hours per day, beginning no earlier than 7:00 am and ending no later than 6:00 pm.

SC-6.02.B.2 Maintenance and cleanup activities may be performed during hours other than regular working hours provided that such activities do not require the startup or operation of construction equipment.

SC-6.02.B.3 If it shall become absolutely necessary to perform Work at night or on Saturdays, Sundays or legal holidays, written notice shall be submitted to OWNER and ENGINEER at least two days in advance of the need for such Work. OWNER will only consider the performance of such Work as can be performed satisfactorily under the conditions. Sufficient lighting and all other necessary facilities for carrying out and observing the Work shall be provided and maintained where such Work is being performed at night.”

SC-6.06.G Modify paragraph 6.06.G. by changing paragraph reference 5.06 to SC-5.04.

SC-6.06.H Add the following new paragraph immediately following paragraph 6.06.G, which is to read as follows:

“SC-6.06.H The CONTRACTOR shall perform with the CONTRACTOR’S own organization, contract work amounting to not less than fifty percent of the original total contract price. The term “the CONTRACTOR’S own organization” shall be construed to include only workmen employed and paid directly by the CONTRACTOR, and equipment owned or rented by the CONTRACTOR, with or without operators.”

SC-6.09.B. Add a new paragraph immediately after paragraph 6.09.B which is to read as follows:

“SC-6.09.C Refer to Article SC-18 for Laws and Regulations which, by terms of said Laws and Regulations are to be included in the Contract Documents. The failure to include in Article SC-18 any Law or Regulation applicable to the performance of the Work does not diminish

CONTRACTOR'S responsibility to comply with all Laws and Regulations applicable to the performance of the work.”

SC-6.10. Add a new paragraph immediately after paragraph 6.10.A, which is to read as follows:

“SC-6.10.B OWNER is exempt from payment of sales and compensating use taxes of the State of New York and of cities and counties on all materials to be incorporated into the Work.

1. OWNER will furnish the required certificates of tax exemption to CONTRACTOR for use in the purchase of supplies and materials to be incorporated into the Work.
2. OWNER'S exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by CONTRACTOR, or to supplies or materials not incorporated into the Work.”

SC-6.15.A. Add a new paragraph immediately after paragraph 6.15.A, which is to read as follows:

“SC-6.15.B CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with all Laws and regulations. CONTRACTOR shall provide a centralized location for the maintenance of the material safety data sheets or other hazard communication information required to be made available by any employer on the Site. Location of the material safety data sheets or other hazard communication information shall be readily accessible to the employees of any employer on the Site.”

SC-7.01 Add a new paragraph immediately after Paragraph 7.01 which is to read as follows:

“SC-7.02 *Separate Contractor Claims*

- A. Should CONTRACTOR cause damage to the work or property of any other contractor at the Site, or should any claim arising out of CONTRACTOR'S performance of the Work be made by any other contractor against CONTRACTOR, OWNER, or ENGINEER, CONTRACTOR shall promptly settle with such other contractor by agreement, or otherwise resolve the dispute by arbitration or at law.
- B. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, and the officer, directors, partners, employees, agents, and other consultants or subcontractors of each and any of them from and against all claims, costs, losses and damages (including but not limited to, all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs)

arising directly, indirectly, or consequentially out of or relating to any claim or action, legal or equitable, brought by any other contractor against OWNER, ENGINEER, to the extent based upon CONTRACTOR'S performance of the Work.

- C. Should another contractor cause damage to the Work or property of CONTRACTOR at the Site or should the performance of work by any other contractor give rise to any other claim, CONTRACTOR shall not institute any action, legal or equitable, against OWNER, ENGINEER, or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from OWNER, ENGINEER, on account of any such damage or claim.
- D. If CONTRACTOR is delayed at any time in performing or furnishing Work by any act or neglect of another contractor and OWNER and CONTRACTOR are unable to agree as to the extent of any adjustment in Contract Times attributable thereto, CONTRACTOR may make a claim for an extension of time in accordance with paragraph 10.05. Notwithstanding any other provision of the Contract Documents, an extension of the Contract Times shall be CONTRACTOR'S sole and exclusive remedy with respect to OWNER, ENGINEER, for any delay, disruption, interference or hindrance caused by any other contractor."

SC-9.03

Add a new paragraph immediately after paragraph 9.03.A which is to read as follows:

"SC-9.03.B. Resident Project Representative (RPR) will be OWNER'S agent at the Site, will act as directed by and under the supervision of OWNER, and will confer with OWNER AND ENGINEER regarding RPR's actions. RPR's dealings in matters pertaining to the on-site Work shall in general be with OWNER and CONTRACTOR keeping ENGINEER advised as necessary. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of CONTRACTOR."

SC-13.07

Modify paragraphs 13.07.A. and C. by changing the words "one year" in the first line to "two years".

SC-14.02,A.

Add a new paragraph immediately after paragraph 14.02.A.3. which is to read as follows:

"4. Each Application for Payment shall be accompanied by a copy of the certified payroll record."

SC-14.07,A. Add a new paragraph immediately after paragraph 14.07.A.3. which is to read as follows:

“4. The Final Application for Payment shall be accompanied by a copy of the certified payroll record.”

SC-14.07.A.2 Modify paragraph 14.07.A.2 by changing the words “subparagraph 5.04.B.7” to “SC-5.04”.

SC-17.06 Add new paragraphs immediately after paragraph 17.06,A. which are to read as follows:

“ARTICLE SC-18 - STATUTORY REQUIREMENTS

SC-18.01 This Article contains portions of certain Laws or Regulations which, by provision of Law or Regulations, are required to be included in the Contract Documents. The material included in this Article may not be complete or current. CONTRACTOR’S obligation to comply with all Laws and Regulations applicable to the Work is set forth in paragraph 6.09 of the General Conditions.

SC-18.02 Non-Discrimination in Employment:

A. During the performance of this contract, CONTRACTOR agrees as follows:

1. CONTRACTOR will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and will take affirmative action to insure that they are afforded equal employment opportunities without discrimination because of race, creed, color or national origin. Such action shall be taken with reference but not limited to: recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on-the-job training.
2. CONTRACTOR will send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the State Commission for Human Rights, advising such labor union or representative of the CONTRACTOR’S agreement under clauses 1. through 8. hereinafter called “non-discrimination clauses”. If the CONTRACTOR was directed to do so by the OWNER as part of the Bid or negotiation of this contract, CONTRACTOR shall request labor union or representative to furnish him with a written statement that such labor union or representative will not discriminate because of race, creed, color or national origin and that such labor union or representative either will affirmatively cooperate within the limits of its legal and contractual authority, in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment, employment, and the terms and conditions of employment under this contract shall be in accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request, that it furnish such a statement, CONTRACTOR shall promptly notify the State Commission for Human Rights of such failure or refusal.

3. CONTRACTOR will post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Commission for Human Rights setting forth the substance of the provisions of clauses 1. through 2. and such provisions of the State's Laws against discrimination as the State Commission for Human Rights shall determine.
4. CONTRACTOR will state, in all solicitations or advertisements for employees placed by or on behalf of CONTRACTOR, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color or national origin.
5. CONTRACTOR will comply with the provisions of the Executive Law, Human Rights Law, Article 15, will furnish all information and reports deemed necessary by the State Commission for Human Rights under these non-discrimination clauses and such sections of the Executive Law, and will permit access to his books, records and accounts by the State Commission for Human Rights, the Attorney General, District Commissioner of Housing and Community Renewal and the Industrial Commission for purposes of investigation to ascertain compliance with these non-discrimination clauses of the Executive Law, Human Rights Law, Article 15.
6. This contract may be forthwith canceled, terminated or suspended, in whole or in part, by the OWNER upon the basis of a finding made by the State Commission for Human Rights that CONTRACTOR has not complied with these non-discrimination clauses, and CONTRACTOR may be declared ineligible for future contracts made by or on behalf of the State or a public authority or agency of the State or housing authority, or an urban renewal agency, or contracts requiring the approval of the Commissioner of Housing and Community Renewal, until he has satisfied the State Commission for Human Rights after conciliation efforts by the Commission have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Commission, notice thereof has been given to CONTRACTOR and an opportunity has been afforded him to be heard publicly before three members of the Commission. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided by law.
7. If this contract is canceled or terminated under clause 6., in addition to other rights of the OWNER provided in this contract upon its breach by CONTRACTOR, CONTRACTOR will hold the OWNER harmless against any additional expenses or costs incurred by the OWNER in completing the Work or in purchasing the services, materials, equipment or supplies contemplated by this contract, and the OWNER may withhold payments from CONTRACTOR in an amount sufficient for this purpose and recourse may be had against the surety on the Performance Bond if necessary.
8. CONTRACTOR will include the provisions of clauses 1. through 2. in every subcontract or purchase order altered only to reflect the proper identity of the parties in such a manner that such provisions will be binding upon each Subcontractor or vendor as to operations to be performed within the State of New York. CONTRACTOR will take such actions in enforcing such provisions of such subcontract or purchase order as the OWNER may direct, including sanctions or remedies for non-compliance. If CONTRACTOR becomes involved in or is threatened with litigation with a Subcontractor or vendor as a result of such

direction by the OWNER, the CONTRACTOR shall promptly so notify the Attorney General, requesting him to intervene and to protect the interest of the State of New York.

SC-18.03 Affirmative Action Requirements:

- A. During the performance of this Contract, the CONTRACTOR agrees that it will abide by and will require its subcontractors to abide by the AUTHORITY'S Affirmative Action Requirements and Women and Minority Business Enterprise Policy, as set forth in the attached Appendix A and hereby made a part of these General Conditions.

SC-18.04 Prevailing Rate Schedule:

- A. The labor on this contract shall be performed in accordance with the requirements of Article 8 (Sections 220-223) of the New York State Labor Law. The supplements to be provided and wages to be paid to workers, laborers and mechanics employed on this contract, determined pursuant to Section 220 of the Labor Law, are set forth in Appendix C, Prevailing Rate Schedule, attached to and hereby made a part of these General Conditions.
- B. CONTRACTOR shall note that the wage rates and supplemental benefits shown in the attached schedules are subject to change. The wage rates and supplemental benefits to be paid and provided shall be those prevailing at the time the contract is being performed.

SC-18.05 Payments to Subcontractors:

- A. In accordance with N.Y. State General Municipal Law, Section 106-b, CONTRACTOR shall:
 1. Within fifteen calendar days of the receipt of any payment from the OWNER, the CONTRACTOR shall pay each of his Subcontractors and materialmen the proceeds from the payment representing the value of the work performed and/or materials furnished by the Subcontractor and/or materialman and reflecting the percentage of the Subcontractor's work completed or the materialman's material supplied in the requisition approved by the OWNER and based upon the actual value of the subcontract or purchase order less an amount necessary to satisfy any claims, liens or judgments 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 Subcontractor is unable or unwilling to provide a Performance bond and a Labor and Material bond both in the full amount of the subcontract at the request of the CONTRACTOR. However, the CONTRACTOR shall retain nothing from those payments representing proceeds owed the Subcontractor and/or materialman from OWNER'S payments to the CONTRACTOR for the remaining amounts of the contract balance after the work or portions thereof are substantially complete. Within fifteen calendar days of the receipt of payment from the

CONTRACTOR, the Subcontractor and/or materialman shall pay each of his 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 OWNER to pay or to see to 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 OWNER.

END OF SUPPLEMENTARY CONDITIONS

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DIVISION 1
GENERAL REQUIREMENTS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. Contract description.
 2. Work by Owner or other Work at the Site.
 3. Owner-furnished products.
 4. Contractor's use of Site and premises.
 5. Future work.
 6. Owner occupancy.
 7. Permits.
 8. Specification conventions.

1.02 GENERAL CONTRACT DESCRIPTION

- A. Contractor shall ensure that all work depicted on the contract drawings and described within specifications is completed and included in submitted bid price.
- B. Work of the Project to be completed by the Contractor shall include all improvements to the existing Sturgeon Point Treatment Plant Raw Water Pump Station in the Town of Evans located at 722 Sturgeon Point Road, Derby, New York 14047 as shown on all Sheets identified with the numbers G-XXX, C-XXX, S-XXX, A-XXX, D-XXX, M-XXX, and E-XXX, and generally described as follows:
1. Construction of an addition to the Raw Water Pump Station.
 2. Replacement of Raw Water screens.
 3. Demolition of the spray water pumps.
 4. Replacement of the discharge butterfly valves and check valves on the Raw Water Pumps.
 5. Refurbish the 48" Raw Water discharge header.
 6. Replacement of the bridge crane in the Pump Room.
 7. Replacement of the indoor lighting.
 8. Improvements to the ventilation.
 9. Replacement of doors, windows, louvers, and floor grating.
 10. Replacement of the Pump Station roof.
 11. Replacement of the sluice gates.
 12. Installation of baffles in the Raw Water Pump Station wet well.
 13. Installation of piping improvements for frazil ice control.
 14. Replacement of the 42-inch Delivered Water Transmission Main including installation of Owner furnished materials.
 15. Replacement of the motor controllers for the five Raw Water Pumps with variable frequency drives.
 16. Replacement of 480V circuit breakers.
 17. Replacement of the 208 volt motor control center.
 18. Sump pump system for water infiltration in electrical conduits.
 19. Demolition of abandoned 5KV switchgear.

SECTION 011000 - SUMMARY

20. Replacement of 2" and 4" potable and process water piping including installation of Owner furnished materials.
 21. Repairs to existing concrete and masonry surfaces.
 22. Removal, storage, handling, and disposal of hazardous waste materials identified per Appendix F.
 23. Associated electrical, instrumentation, controls, and SCADA.
 24. Performance tests.
 25. Contingency Allowances.
- C. The project includes Milestone M1 which consists of completing all work associated with the new 42-inch Delivered Water Transmission Main, including:
1. Test Pits.
 2. Excavation.
 3. Installation of Owner furnished materials.
 4. Backfill.
 5. Select Fill.
 6. Testing and Disinfection.
 7. Interconnections.
 8. Restoration may be completed as part of Substantial Completion.
 9. Record Documents.

1.03 WORK BY OWNER OR OTHERS

- A. Coordinate work with other contractors including but not limited to the following:
1. Owner's electrical contractor: shut-downs and other ongoing work.
 2. Contractor for Owner Contract OBG-12A, Sturgeon Point and Van de Water Improvements Project: staging areas and parking, access roads.
 3. Contractor for Owner Contract OBG-12B, Sturgeon Point Outfall Rehabilitation: staging areas and parking, access roads.
 4. Owner to replace 230V heaters with 120V on Pump Motors No. 2 and 3.

1.04 OWNER-FURNISHED PRODUCTS

- A. Owner's Responsibilities:
1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples to Contractor.
 2. Arrange and pay for delivery to Site.
 3. Inspect products jointly with Contractor.
 4. Replace damaged, defective, or deficient items.
 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
1. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
 2. Inspect for completeness or damage jointly with Owner.
 3. Handle, store, install, and finish products.
 4. Repair or replace items damaged after receipt.

SECTION 011000 - SUMMARY

- C. The following items will be furnished by the Owner for installation by the Contractor regarding the 42-inch diameter Delivered Water Transmission Main.
1. Ductile iron pipe – 220 LF.
 2. 42-inch joint restraints – 28 each.
 3. 45 degree mechanical joint bends – 7 each.
 4. Solid sleeve adapters – 7 each.
 5. Polywrap – 240 LF.
 6. Filler rod for PCCP adapters – 12 LF.
 7. PCCP joint diapers – 2 each.
 8. 42" x 6" PCCP tapping saddle – 1 each.
 9. PCCP bell by ductile iron pipe adapter – 1 each.
 10. PCCP spigot by ductile iron pipe adapter – 1 each.
 11. Fire hydrant – 1 each.
 12. 6-inch gate valve – 1 each.
 13. 6-inch tapping valve – 1 each.
 14. 6-inch ductile iron pipe – 20 LF.
 15. 6-inch joint restraints – 10 each.
 16. Nuts, bolts, and washers for the 42" and 6" pipe fittings.
- D. The following items will be furnished by the Owner for installation by the Contractor regarding the backflow prevention for the Raw Water Pump Station.
1. 4-inch RPZ backflow preventer – 2 each.
 2. 2-inch RPZ backflow preventer – 3 each.

1.05 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Time Restrictions for Performing Work: Monday through Friday, 7:00 am – 6:00 pm excluding Owner holidays unless prior authorization received from Owner for different days and times.
- B. Utility Outages and Shutdown:
1. Coordinate and schedule utility outages with Owner.
 2. Outages: Allowed only at previously agreed upon times
 3. At least one week before scheduled outage, submit Outage Request Plan to Engineer itemizing the dates, times, and duration of each requested outage.
- C. Sound Level Restrictions: Sound pressure level measured at boundary of Site shall not exceed 40 dBA. Contractor is to be aware that residents live nearby to project site and care shall be taken to limit noises to reasonable times.
- D. Construction Plan: Before start of construction provide construction plan regarding access to Work, use of Site, and utility outages for review by Engineer and acceptance by Owner. After acceptance of plan, construction operations shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.06 OWNER OCCUPANCY

- A. Owner will occupy Site during entire period of construction. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

SECTION 011000 - SUMMARY

- B. Schedule the Work to accommodate Owner occupancy and continued operation of the pumping station.

1.07 PERMITS

- A. Furnish all necessary permits for construction of Work including the following:
 - 1. None required.
- B. All permit costs shall be included in Bid.

1.08 SPECIFICATION CONVENTIONS

- A. These Specifications are written in imperative mood and streamlined form. This imperative language is directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 012700 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description
- B. Engineer's Estimate of Quantities
- C. Contingency Allowance
- D. Adjustment of Unit Prices for Increase or Decrease of Estimated Quantities
- E. Related Provisions
- F. Bid Items
- G. Schedule of Allowances

1.02 DESCRIPTION

- A. The items listed below in Articles 1.07, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant, services, Engineer's and/or Contractor's field offices, layout surveys, job signs, sanitary requirements, permits, testing, safety devices, approval and record drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, bonds, insurance, test pits and all other requirements of the General Conditions, Supplementary Conditions, and the General Requirements. Compensation for all such services, things and materials shall be included in the prices stipulated for the lump sum and work unit price pay items listed herein.
- B. The lump sum and unit bid prices will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- C. The Contractor shall furnish all labor, materials, tools, equipment, services, and all appurtenances necessary to perform all work required, at the unit or lump sum prices for the items listed in the Bidder's Proposal. Each bid item shall include all costs to perform all work to complete each item. Work shall include, but is not necessarily limited to earth excavation, disposal of excess excavated material, handling of all water, dewatering, earth backfill, select backfill, concrete, installation of electrical equipment, conduits, cables, terminations, splices, pull boxes, fittings, hangers, wall penetrations, junction boxes, instrumentation and control, grounding, all final restoration, and testing.
- D. Where fixed minimum unit prices are called for under an item heading, the bidder shall include a price not less than the stated minimum. Bidders' Proposals received which include a unit price less than the stated minimum shall be adjusted to meet the minimum unit price.

SECTION 012700 - MEASUREMENT AND PAYMENT

1.03 ENGINEER'S ESTIMATE OF QUANTITIES

- A. Engineer's estimated quantities for unit price pay items, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. Owner does not expressly or by implication agree that the nature of the materials encountered or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as Owner may deem necessary. Except as provided in Article 1.05, Contractor or Owner will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions caused by changes or alterations in the Work ordered by Owner.

1.04 CONTINGENCY ALLOWANCE

- A. Work that will be done and paid for under an allowance will be authorized in Owner's written instruction to Contractor.
- B. Do not provide work under an allowance without prior written authorization of Owner.
- C. Contingency allowances are stipulated amounts available as reserved for sole use by Owner to cover unanticipated costs.
- D. When authorization of Work under contingency allowance is contemplated by Owner for a defined scope, submit Change Order proposal to Engineer. Prepare Change Order proposal in accordance with the General Conditions as may be modified by the Supplementary Conditions, except that payments within limit of contingency allowance shall exclude cost of bond and insurance premiums.

1.05 ADJUSTMENT OF UNIT PRICES FOR INCREASE OR DECREASE OF ESTIMATED QUANTITIES

- A. For bid items paid for on a unit price basis, increases or decreases in the quantity of an item of Work will be determined by comparing the total payable quantity of Work with Engineer's estimated quantity as shown in the Bid Form. Increase or decreases will only be considered if the Schedule of Values as required in Section 012900 has been prepared, submitted, and approved.
- B. If the total payable quantity of any unit price item of Work, which has an as-bid computed total value of five percent or more of the sum of the as-bid computed total values of all items bid, varies from Engineer's estimate of quantity therefore by more than 50 percent, the unit price of that item will be a subject of review by Engineer. If warranted, an equitable adjustment will be made by means of a Change Order to credit Owner with any reduction in cost or to compensate Contractor for any increase in cost resulting from the change in quantity. This review of the adjustment will be made at a time Engineer deems reasonable and proper.
- C. Payment for any unit price item of Work which has an as-bid computed total value of less than five percent of the sum of the as-bid computed total values of all items bid, will be made at the unit price bid regardless of an increase or decrease in quantity.

SECTION 012700 - MEASUREMENT AND PAYMENT

1.06 RELATED PROVISIONS

- A. Payments to Contractor: Refer to General Conditions and Agreement.
- B. Changes in Contract Price: General Conditions.
- C. Summary: Section 011000.
- D. Schedule of Values: Section 012900.

1.07 BID ITEMS

A. ITEM 1 – RAW WATER PUMP STATION IMPROVEMENTS

- 1. Work Included:
 - a. The work shall consist of furnishing all labor, materials, equipment, and incidentals to construct the improvements at the Sturgeon Point Raw Water Pump Station, as shown, specified, and directed.
 - b. The work shall include all work as described in Section 011000.
- 2. Measurement and Payment:
 - a. Measurement and payment will be made for the work completed, tested, ready to use, and approved by the Engineer.
 - b. Payment will be made in accordance with the lump sum price stated in the itemized breakdown specified in Section 012900 – Schedule of Values, and shall constitute full payment for all work performed, tested, and approved by the Engineer for payment.
 - c. The percentage of completion for each item of the lump sum amount shall be as determined by the Engineer.

B. ITEM 2 – MISCELLANEOUS CONTINGENCY ALLOWANCE

- 1. Measurement: Allowance includes a stipulated amount available as reserve for sole use by Owner to cover unanticipated costs.
- 2. Include an allowance of \$250,000 for Bid Item 2.
- 3. Payment for Work authorized under Item 2 will be full compensation for providing all Work authorized under the contingency allowance, complete as specified or directed by Engineer. Work authorized under contingency allowance may be included in subsequent Application(s) for Payment, as applicable, following authorization and performance of contingency allowance Work.

C. ITEM 3 – DOOR ACCESS CONTINGENCY ALLOWANCE

- 1. Measurement: Allowance includes a stipulated amount available as reserve for sole use by Owner to cover unanticipated costs.
- 2. Include an allowance of \$50,000 for Bid Item 3.

SECTION 012700 - MEASUREMENT AND PAYMENT

3. Payment for Work authorized under Item 3 will be full compensation for providing all Work authorized under the contingency allowance, complete as specified or directed by Engineer. Work authorized under contingency allowance may be included in subsequent Application(s) for Payment, as applicable, following authorization and performance of contingency allowance Work.

D. ITEM 4 – SCADA CONTINGENCY ALLOWANCE

1. Measurement: Allowance includes a stipulated amount available as reserve for sole use by Owner to cover unanticipated costs.
2. Include an allowance of \$50,000 for Bid Item 4.
3. Payment for Work authorized under Item 4 will be full compensation for providing all Work authorized under the contingency allowance, complete as specified or directed by Engineer. Work authorized under contingency allowance may be included in subsequent Application(s) for Payment, as applicable, following authorization and performance of contingency allowance Work.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.01 SCHEDULE OF ALLOWANCES

- A. Include a stipulated contingency allowance of \$250,000.00 for Bid Item 2 – Miscellaneous Contingency Allowance for use in accordance with the Owner's instruction to perform miscellaneous work such as, but not limited to:
 1. Unanticipated work.
 2. Site Security Services.
 3. Repairs to the 48-inch Raw Water Discharge Header.
 4. Hazardous material handling and disposal beyond that shown or specified.
 5. Rock removal.
 6. Additional watermain materials for the 42-inch Delivered Water Transmission Main.
 7. Mitigation of water infiltration into the electrical duct banks.
 8. Repairs to existing concrete surfaces beyond the limits stipulated.
 9. Repairs to existing masonry surfaces beyond the limits stipulated.
- B. Include a stipulated contingency allowance of \$50,000.00 for Bid Item 3 – Door Access Contingency Allowance for use in accordance with the Owner's instruction for door access control work to be performed by Stanley Security Services.
- C. Include a stipulated contingency allowance of \$50,000.00 for Bid Item 4 – SCADA Contingency Allowance for use in accordance with the Owner's instruction for SCADA system work to be performed by Kaman-Zeller-ACS.

END OF SECTION

SECTION 012900 - SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description
- B. Preparation
- C. Submittal

1.02 DESCRIPTION

- A. The Schedule of Values is an itemized list that establishes the value or cost of each part of the Work. It shall be used as the basis for preparing progress payments and may be used as a basis for negotiations concerning additional work or credits which may arise during the construction. Quantities and unit prices may be included in the schedule when approved by or required by the Engineer.

1.03 PREPARATION

- A. Schedule shall show breakdown of labor, materials, equipment, reports and other costs used in preparation of the Bid.
- B. Costs shall be in sufficient detail to indicate separate amounts for each Section of the Specification and each site.
- C. Include an item for bond, insurance, temporary facilities and job mobilization/demobilization. This item will be included for payment in accordance with Section 012700.
- D. Schedule of Values shall be prepared on 8½-inch by 11-inch white paper and provided electronically in Excel format.
- E. Use Table of Contents of the Specifications as basis for Schedule format and identify each item with number and title in the Table of Contents. List sub-items of major products or systems as appropriate or when requested by Engineer.
- F. When requested by Engineer, support values with data that will substantiate their correctness.
- G. The sum of the individual values shown on the Schedule of Values must equal the total Contract Price.
- H. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

SECTION 012900 - SCHEDULE OF VALUES

- I. Schedule shall show the purchase and delivery costs for materials and equipment that the Contractor anticipates he shall request payment for prior to their installation.
- J. Included in the detailed breakdown shall be a line item for "record documents". This amount is for preparing and supplying required information and documentation.

1.04 SUBMITTAL

- A. Submit two copies of 8 ½-inch by 11-inch paper and an electronic file in Excel format of Schedule to Engineer for approval at least 20 days prior to submitting first application for a progress payment but no later than 10 days after date of execution of agreement. After review by Engineer, revise and resubmit Schedule as required until it is approved.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Coordination and Project conditions.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Closeout meeting.

1.02 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.
- C. The Contractor shall furnish to the Engineer an emergency phone number list for 24 hour contact during the construction period. Include numbers for office phones, pagers, and cellular phones, as applicable. The list should include, but not be limited to:
 - Contractor's office representative,
 - Contractor's field superintendent,
 - Contractor's foreman,
 - Owner's main office,
 - Owner's 24 hour emergency number,
 - Project Engineer
 - Project Inspector,
 - Utility companies such as gas, water, telephone, cable, TV, etc.
 - Highway Departments,
 - Other involved agencies.
 1. Contractor shall add names and numbers given to him by Engineer and resubmit to Engineer as requested.
 2. Emergency phone list must be submitted and considered acceptable to Engineer prior to the start of construction.
 3. Phone list must be neatly typed and work processed and submitted on 8 ½ x 11 inch paper.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

- D. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practical; place runs parallel with lines of building. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 - 1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to function as intended. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are important.
- E. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy and for portions of Work designated for Owner's occupancy.
- H. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

1.03 PRECONSTRUCTION MEETING

- A. Engineer will schedule and preside over meeting after Notice of Award.
- B. Attendance Required: Engineer, Owner, Resident Project Representative, appropriate governmental agency representatives, Construction Manager, major Subcontractors, Contractor and Contractor's on-site supervisor.
- C. Minimum Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Review of Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule.
 - 5. Designation of personnel representing parties in Contract, and Engineer.
 - 6. Communication procedures.
 - 7. Procedures and processing of requests for interpretations, field decisions, and field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
 - 9. Critical Work sequencing.
 - 10. Scheduling activities of testing agency.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

- D. Site Mobilization Issues:
1. Use of premises by Owner and Contractor.
 2. Owner's requirements.
 3. Construction facilities and controls provided by Owner.
 4. Temporary utilities provided by Owner.
 5. Survey and building layout.
 6. Security and housekeeping procedures.
 7. Schedules.
 8. Procedures for testing.
 9. Procedures for maintaining record documents.
 10. Requirements for startup of equipment.
 11. Inspection and acceptance of equipment put into service during construction period.
- E. Engineer will record minutes and distribute copies to participants within three business days after meeting, with one copy each to those in attendance.

1.04 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum bi-weekly intervals.
- B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.
- C. Attendance Required: Job superintendent, major Subcontractors, Contractor and suppliers, and Engineer, Owner, as appropriate to agenda topics for each meeting.
- D. Minimum Agenda:
1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems impeding planned progress.
 5. Review of submittal schedule and status of submittals.
 6. Review of off-Site fabrication and delivery schedules.
 7. Maintenance of Progress Schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on Progress Schedule and coordination.
 13. Other business relating to Work.
- E. Engineer will record minutes and distribute copies to participants within three business days after meeting, with one copy each to those affected by decisions made.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

1.05 CLOSEOUT MEETING

- A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.
- B. Attendance Required: Contractor Construction Manager, Engineer, Owner, and others appropriate to agenda.
- C. Notify Engineer four days in advance of proposed meeting date.
- D. Minimum Agenda:
 - 1. Start-up of facilities and systems.
 - 2. Operations and maintenance manuals.
 - 3. Testing, adjusting, and balancing.
 - 4. System demonstration and observation.
 - 5. Operation and maintenance instructions for Owner's personnel.
 - 6. Contractor's inspection of Work.
 - 7. Preparation of a final "punch list."
 - 8. Procedure to request Engineer inspection to determine date of Substantial Completion.
 - 9. Completion time for correcting deficiencies.
 - 10. Inspections by authorities having jurisdiction.
 - 11. Partial release of retainage.
 - 12. Final cleaning.
 - 13. Preparation for final inspection.
 - 14. Closeout Submittals:
 - a. Project record documents.
 - b. Operating and maintenance documents.
 - c. Operating and maintenance materials.
 - d. Affidavits.
 - 15. Final Application for Payment.
 - 16. Contractor's demobilization of Site.
 - 17. Maintenance.
 - 18. Equipment Warranty.
- E. Engineer will record minutes and distribute to participants within three days after meeting, with one copy each to those affected by decisions made.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.01 ALTERATION PROCEDURES

- A. Entire facility will be occupied for normal operations during progress of construction. Cooperate with Owner in scheduling operations to minimize conflict and to permit continuous usage.
 - 1. Perform Work not to interfere with operations of occupied areas.
 - 2. Keep utility and service outages to a minimum and perform only after written approval of Owner.
 - 3. Clean Owner-occupied areas daily. Clean spillage, overspray, and heavy collection of dust in Owner-occupied areas immediately.
- B. Materials: As specified in product Sections; match existing products with new and salvaged products for patching and extending Work.
- C. Employ skilled and experienced installer to perform alteration and renovation Work.
- D. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion. Comply with Section 017000 - Execution and Closeout Requirements
- E. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- F. Remove debris and abandoned items from area and from concealed spaces.
- G. Prepare surface and remove surface finishes to permit installation of new Work and finishes.
- H. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.
- I. Remove, cut, and patch Work to minimize damage and to permit restoring products and finishes to original or specified condition.
- J. Refinish existing visible surfaces to remain in renovated rooms and spaces, to specified or renewed condition for each material, with neat transition to adjacent finishes.
- K. Where new Work abuts or aligns with existing Work, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- L. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect/Engineer for review.

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

- M. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.
- N. Finish surfaces as specified in individual product Sections.

END OF SECTION

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description
- B. Submittals
- C. Use of Owner's Facilities
- D. Shutdowns, Tie-ins and Coordination with Owner's Operations
- E. Work Sequence

1.02 DESCRIPTION

- A. Contractor shall carry out all operations to avoid interference with the operations of the existing facilities. The Raw Water Pump Station must maintain operation 24 hours a day 7 days a week except as allowed herein.
- B. Contractor shall cooperate fully with the Owner when the Contractor's operations or unforeseen conditions beyond the Owner's control negatively effect the operation of the Raw Water Pump Station. The Contractor shall cooperate fully with the Owner including the stopping of work to avoid loss of pumping and/or detrimental water quality issues, at no additional cost to the Owner.
- C. The Owner may restrict the Contractor's operations with respect to shutdowns, tie-ins, and starting and placing equipment in operation as specified.

1.03 SUBMITTALS

- A. For work which may affect the Owner's operations and for proposed connections including shutdowns of, and tie-ins to process, mechanical or electrical systems, submit to the Engineer for approval the following:
 - 1. Detailed schedules and descriptions of construction procedures.
 - 2. Inventory of labor, materials, equipment and supplies needed to perform the work.
 - 3. Detailed description of all preparatory work.
 - 4. Submittals required for equipment and material described under other Sections.
 - 5. The plan shall clearly demonstrate the Contractor's ability to meet the time limitations specified.
 - 6. Communications plan to coordinate work with Engineer and Owner.
 - 7. Detailed plan to respond to any emergency or unforeseen circumstance that could result from Contractor's activities.
- B. All information submitted shall be in conformance with Section 013300 - Submittal Procedures.

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

- C. All information shall be submitted not less than 21 days prior to commencing the work. Contractor shall provide Owner written notice at least 2 weeks before shutdowns or tie-ins are required.
- D. No work which may affect the Owner's operations will be permitted until the required submittals are approved by the Engineer.

1.04 USE OF OWNER'S FACILITIES

- A. Contractor may use existing facilities, grounds or equipment in the new Work for construction purposes only if the Owner's written permission is obtained.
- B. Restore existing facilities, grounds and equipment used for temporary purposes to original condition in a manner satisfactory to Owner.
- C. Contractor shall assume full responsibility for any damage that may result to existing or new facilities, grounds or equipment used for construction purposes and shall repair or replace any damaged facilities, grounds or equipment at Contractor's cost.
- D. The Contractor will be allowed to use existing or new bridge crane in the Raw Water Pump Station. Refer to Appendix D for an inspection report for the existing bridge crane.
- E. The Contractor will not be allowed to store equipment in the Raw Water Pump Station.
- F. The Owner will provide a 300 KW and a 500 KW portable generators for use by the Contractor. Fuel will be at the expense of the Contractor. The Contractor shall be responsible for all connections (material and labor).

1.05 SHUTDOWNS, TIE-INS AND COORDINATION WITH OWNER'S OPERATIONS

- A. All operation of existing valves and gates required for shutdowns and bypasses shall be done by the Owner. All operation of existing electrical equipment required for shutdowns shall be done by the Owner, unless otherwise directed by the Owner or Engineer or as noted in the Plans and Specifications.
- B. Insofar as possible, all equipment and material shall be tested and in operating condition and all preparatory work shall be completed to the greatest extent possible before shutdowns or tie-ins are commenced.
- C. Work that requires shutdowns and tie-ins to the existing electrical facilities shall be coordinated with the Owner and Engineer. The Contractor may be limited to a specific period of time for the shutdown, and/or non-standard working hours for shutdowns, so as not to interfere with the pump station operation. Shutdowns shall be limited to a maximum of four (4) hours.

Where work cannot be accomplished within four (4) hours, the Contractor shall be responsible for all costs, fees, labor, etc. to provide the Owner with temporary utility services, equipment, etc. to maintain normal operation at the facility. This may include but not be limited to temporary power via portable generators.

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

- D. All work shall be scheduled at the convenience of the Owner and under no circumstances shall it adversely affect the pump station operation. Work shall not interfere with the Owner in meeting pumping requirements as are imposed upon the existing system.
- E. Contractor shall coordinate the shutdowns, tie-ins and connection work with the Owner, Engineer, and other Work specified under this Contract.

1.06 WORK SEQUENCE

- A. Only one of the following will be allowed to be out of service at any one time to facilitate the work. All work associated with a shut-down shall be completed at that time. Only one shut-down of each will be allowed except as outlined below.
 - 1. 42" Delivered Water Transmission Main – 8 hours for the interconnections.
 - 2. Sluice gates – 7 days each.
 - 3. Spray water piping – 8 hours.
 - 4. Raw Water Screens – 14 days each.
 - 5. Raw Water Pumps and Motors – 7 days each.
 - 6. Raw Water Pump Station wet wells and 48" discharge headers – 7 days each.
- B. No shut-downs will be allowed between Memorial Day and Labor Day. No shut-downs for frazil ice control will be allowed when the systems are in use by the Owner for zebra mussel control.
- C. Provide temporary power for shut-downs of the Raw Water Pump Station MCC and electrical systems as needed, including but not limited to temporary panels, cabling, and lighting. Fuel will be at the expense of the Contractor.
- D. The work sequences shall be as follows.
 - 1. 42" Delivered Water Transmission Main.
 - a. Perform test pits.
 - b. Obtain the Owner furnished materials.
 - c. Verify that the Owner furnished materials are sufficient. Prepare and submit to the Engineer a detailed piping layout for the proposed work.
 - d. Install the new section of 42" main up to points of interconnection.
 - e. Contractor to provide 42" plugs for testing with sufficient outlets to obtain scouring velocity.
 - f. Install the fire hydrant.
 - g. Pressure test and disinfect.
 - h. Obtain approvals.
 - i. Shut down the existing 42" Main (by Owner).
 - j. Dewater the existing and new 48" transmission mains as required.
 - k. Perform both interconnections concurrently (8 hours maximum).
 - l. Return the 42" Main to service (by Owner).
 - m. Complete the work within 45 days of the Notice to Proceed.
 - 2. Spray water piping:
 - a. Shut down the existing spray water piping (by Owner).
 - b. Demolish the existing spray water pumps and piping.

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

- c. Install the new spray water piping.
 - d. Install the two (2) 4" RPZ backflow preventers furnished by the Owner.
 - e. Return the spray water piping to service (by Owner).
 - f. Perform a visual leakage inspection.
 - g. Complete the work prior to the Raw Water Screen replacement work.
3. Construct the Raw Water Pump Station building addition including replacement of the roof on the existing Pump Station. Provide temporary roof. Contractor to verify the size needed for the roof hatches needed for the replacement of the Raw Water Screens.
4. Sluice Gates:
- a. Work to be performed underwater as required.
 - b. Perform underwater inspections to confirm dimensions of the existing sluice gates within 30 days of the notice to Proceed.
 - c. Reduce the raw water flow to the extent possible (by Owner).
 - d. Demolish Sluice Gates Nos. 1 and 2 and install new Sluice Gates.
 - e. Re-establish raw water flow (by Owner).
 - f. Close Sluice Gate No. 1 (by Owner).
 - g. Demolish Sluice Gate No. 3 and install new Sluice gate.
 - h. Open Sluice Gate No. 1 (by Owner).
 - i. Close Sluice Gate No. 2 (by Owner).
 - j. Demolish Sluice Gate No. 4 and install new Sluice gate.
 - k. Operate Raw Water Pump Nos. 1 and 2 only (by Owner).
 - l. Demolish Sluice Gate No. 5 and install new Sluice gate.
 - m. Open Sluice Gate No. 2 and re-establish normal raw water pumping.
5. Raw Water Screen No. 1:
- a. Close sluice gates to isolate screen (by Owner).
 - b. Shut off spray water piping (by Owner).
 - c. Shut off and lock out electrical (by Owner).
 - d. Dewater the screen channel.
 - e. Demolish aluminum screen shroud.
 - f. Demolish Raw Water Screen No. 1.
 - g. Demolish screen wall guides and support columns.
 - h. Demolish floor grating and supports.
 - i. Demolish the two access ladders and install the new FRP ladders.
 - j. Install new screen wall guides and support columns.
 - k. Install frazil ice air bubbler diffuser and piping.
 - l. Install new Raw Water Screen No. 1.
 - m. Install new aluminum shroud.
 - n. Install new floor grating and supports.
 - o. Install new 4" spray water piping connection including new isolation gate valve, pressure reducing valve, pressure switch, and electric motor operated butterfly valve.
 - p. Install new screen control panel, ultrasonic level meter, wiring, and controls.
 - q. Open Sluice Gates Nos. 1 and 3 (by Owner).
 - r. Performance Tests.

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

6. Raw Water Screen No. 2:
 - a. Close sluice gates to isolate screens (by Owner).
 - b. Shut off spray water piping (by Owner).
 - c. Shut off and lock out electrical (by Owner).
 - d. Dewater the screen channel.
 - e. Demolish aluminum screen shroud.
 - f. Demolish Raw Water Screen No. 2.
 - g. Demolish screenings trough.
 - h. Demolish screen wall guides and support columns.
 - i. Demolish floor grating and supports.
 - j. Demolish the two access ladders and install the new FRP ladders.
 - k. Install new screen wall guides and support columns.
 - l. Install frazil ice air bubbler diffuser and piping.
 - m. Install new Raw Water Screen No. 2.
 - n. Install new screenings trough.
 - o. Install new aluminum shroud.
 - p. Install new floor grating and supports.
 - q. Install new 4" spray water piping connection including new isolation gate valve, pressure reducing valve, pressure switch, and electric motor operated butterfly valve.
 - r. Install new screen control panel, ultrasonic level probes, wiring, and controls.
 - s. Open Sluice Gates Nos. 2 and 4 (by Owner).
 - t. Performance Tests.

7. Process Water Piping:
 - a. Install the two (2) 2" RPZ backflow preventers furnished by the Owner.
 - b. Install the new 2" supply for seal water for the Raw Water Pumps.
 - c. Transfer the seal water connections for each Raw Water Pump one at a time.
 - d. Demolish the existing process water piping.

8. Raw Water Pump Nos 1 and 4:
 - a. Shut-down Raw Water Pump No. 1 (by Owner).
 - b. Contractor shall have a 30" blind flange, gasket, nuts, and bolts available on-site for immediate use if needed to return the 48" header to service.
 - c. Isolate the associated portion of the 48" Raw Water discharge header (by Owner).
 - d. Dewater the 48" discharge header.
 - e. Remove existing butterfly valve and check valve.
 - f. Inspect the associated portion of the 48' discharge header for condition and needed repairs. Submit a report to the Engineer for review. Repair work will be authorized under the Miscellaneous Contingency Allowance.
 - g. Install the new 30" butterfly valve.
 - h. Return the 48" discharge header to service (by Owner).
 - i. Install the new 30" check valve.
 - j. Install the new VFD.
 - k. Performance Tests.
 - l. Repeat above for Raw Water Pump No. 4.

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

9. Raw Water Pump Nos 2, 3, and 5:
 - a. Shut-down Raw Water Pump No. 2 (by Owner).
 - b. Contractor shall have a 30" blind flange, gasket, nuts and bolts available on-site for immediate use if needed to return the 48" header to service.
 - c. Isolate the associated portion of the 48" Raw Water discharge header (by Owner).
 - d. Remove existing butterfly valve and check valve.
 - e. Install the new 30" butterfly valve.
 - f. Return the 48" discharge header to service (by Owner).
 - g. Install the new 30" check valve.
 - h. Install the new VFD.
 - i. Performance Tests.
 - j. Repeat above for Raw Water Pump No. 3.
 - k. Repeat above for Raw Water Pump No. 5.
10. West wet well and 48" discharge header:
 - a. Complete the improvements to Raw Water Pumps 4 and 5 prior to commencing this work.
 - b. Close sluice gates to isolate the west wet well (by Owner).
 - c. Isolate the associated portion of the 48" discharge header (by Owner).
 - d. Only Screen No. 2, the east wet well, and Raw Water Pump Nos. 3, 4 and 5 are available to the Owner for operation.
 - e. Dewater the wet well
 - f. Dewater the 48" discharge header.
 - g. Construct baffles for Pump Nos. 1 and 2.
 - h. Demolish the access ladder and install the new FRP ladder.
 - i. Refurbish the exterior of the 48" discharge header – clean, sandblast, prime, paint, replace nuts and bolts.
 - j. Return the west wet well and 48" discharge header to service (by Owner).
11. East wet well and 48" discharge header:
 - a. Complete the improvements to the west wet well and to Raw Water Pumps 1 and 2 prior to commencing this work.
 - b. Close sluice gates to isolate the east wet well (by Owner).
 - c. Isolate the associated portion of the 48" discharge header (by Owner).
 - d. Only Screen No. 1, the west wet well, and Raw Water Pump Nos. 1 and 2 are available to the Owner for operation.
 - e. Dewater the wet well
 - f. Dewater the 48" discharge header.
 - g. Construct baffles for Pump Nos. 3, 4, and 5.
 - h. Demolish the access ladder and install the new FRP ladder.
 - i. Refurbish the exterior of the 48" discharge header – clean, prime, paint, replace nuts and bolts.
 - j. Install new floor grating and supports.
 - k. Return the east wet well and 48" discharge header to service (by Owner).
12. Raw Water Pump Motor Controllers (VFD's):
 - a. Shut-off and lockout power at the switchboard.
 - b. Remove existing motor controller.
 - c. Core drill floor/slab and install new conduits and wiring.
 - d. Install new VFD, energize power, commission, and test.

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

13. Remaining work items can be performed as the schedule permits.
 - a. Replace doors, overhead doors, windows, and louvers.
 - b. Replace lighting.
 - c. Ventilation improvements.
 - d. Replace bridge crane.
 - e. Provide new screenings basket.
 - f. Replace the 208 volt motor control center (complete prior to raw water screens).
 - g. Demolition of the abandoned 5KV switchgear.
 - h. Potable water piping modifications including installation of 2" backflow preventers furnished by the Owner.
 - i. Replace 480 V switch board breakers (complete within 100 days of Notice to Proceed).
 - j. Tank, sump pump, and drain line for the electrical manhole.
 - k. Remove existing sump pump and associated electrical in the electrical manhole (4 hour maximum shut-down).
 - l. Repairs to existing concrete surfaces.
 - m. Potable water piping.

14. Project closeout
 - a. Project closeout meeting.
 - b. Complete final punch list.
 - c. Provide Operation and Maintenance Manuals,
 - d. Provide training of Owner personnel.
 - e. Demobilization.
 - f. Final inspection.
 - g. Release of liens forms.
 - h. Provide application for final payment.
 - i. Project record documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 013110 - COORDINATION WITH OWNER'S OPERATIONS

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SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Quality assurance.
- C. Bar chart schedules.
- D. Review and evaluation.
- E. Updating schedules.
- F. Distribution.

1.02 SUBMITTALS

- A. Schedule Updates:
 - 1. Overall percent complete, projected and actual.
 - 2. Completion progress by listed activity and subactivity, to within five working days prior to submittal.
 - 3. Changes in Work scope and activities modified since submittal.
 - 4. Delays in submittals or resubmittals, deliveries, or Work.
 - 5. Adjusted or modified sequences of Work.
 - 6. Other identifiable changes.
 - 7. Revised projections of progress and completion.
- B. Narrative Progress Report:
 - 1. Submit with each bi-weekly submission of Progress Schedule.
 - 2. Summary of Work completed during the past period between reports.
 - 3. Work planned during the next period.
 - 4. Explanation of differences between summary of Work completed and Work planned in previously submitted report.
 - 5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
 - 6. Corrective action taken or proposed.
- C. Submit initial schedule no later than ten days after Notice to Proceed. Subsequent schedule updates shall be submitted with Monthly Payment Applications.

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

1.03 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request, and having use of computer facilities capable of delivering detailed graphic printout within 4 hours of request.

1.04 BAR CHART SCHEDULES

- A. Format: Bar chart Schedule, to include at least:
 - 1. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:
 - a. Subcontract Work.
 - b. Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
 - c. Move-in and other preliminary activities.
 - d. Equipment and equipment system test and startup activities.
 - e. Project closeout and cleanup.
 - f. Work sequences, constraints, and milestones.
 - 2. Listings identified by Specification Section number.
 - 3. Identification of the following:
 - a. Horizontal time frame by year, month, and week.
 - b. Duration, early start, and completion for each activity and subactivity.
 - c. Critical activities and Project float.
 - d. Subschedules to further define critical portions of Work.
 - 4. Provide schedule and all updates on 11" x 17" paper.
 - 5. Provide cash flow schedule.

1.05 REVIEW AND EVALUATION

- A. Participate in joint review and evaluation of schedules with Engineer at each submittal.
- B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
- C. After review, revise schedules incorporating results of review, and resubmit within 3 days.

1.06 UPDATING SCHEDULES

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update schedules to depict current status of Work.

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

- C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Upon approval of a Change Order, include the change in the next schedule submittal.
- E. Indicate changes required to maintain Date of completion of work in each Phase and Total Completion.
- F. Submit sorts as required to support recommended changes.
- G. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect.

1.07 DISTRIBUTION

- A. Following joint review, distribute copies of updated schedules to Contractor's Project site file, to Subcontractors, suppliers, Engineer, and Owner.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Definitions.
- B. Submittal procedures.
- C. Proposed product list.
- D. Product data.
- E. Use of electronic CAD files of Project Drawings.
- F. Shop Drawings.
- G. Samples.
- H. Other submittals.
- I. Test reports.
- J. Certificates.
- K. Manufacturer's instructions.
- L. Manufacturer's field reports.
- M. Erection Drawings.
- N. Construction photographs.
- O. Contractor review.
- P. Architect/Engineer review.
- Q. Shop drawing procedures.

1.02 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.
- B. Informational Submittals: Written and graphic information and physical Samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

SECTION 013300 - SUBMITTAL PROCEDURES

1.03 SUBMITTAL PROCEDURES

- A. Transmit each submittal with AIA G810 - Transmittal Letter CSI Form 12.1A - Submittal Engineer-accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- D. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite Project, submit electronic submittals via e-mail as PDF electronic files to Engineer. Coordinate submission of related items.
- F. For each submittal for review, allow 10 business days excluding delivery time to and from Contractor.
- G. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- H. Allow space on submittals for Contractor and Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized nor processed.
- L. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Architect/Engineer.

1.04 PROPOSED PRODUCT LIST

- A. Within 10 business days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.05 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.

SECTION 013300 - SUBMITTAL PROCEDURES

- B. Submit electronic submittals via email as PDF electronic files.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.06 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
 - 2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 - 4. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
 - 5. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
 - 6. Receiver shall not hold Engineer responsible for such viruses or their consequences, and shall hold Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.
 - 7. Contractor will sign waiver for use of electronic CAD files as included.

1.07 SHOP DRAWINGS

- A. Shop Drawings: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

SECTION 013300 - SUBMITTAL PROCEDURES

- C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
 - 1. Include signed and sealed calculations to support design.
 - 2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 - 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit electronic submittals via email as PDF electronic files.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.08 SAMPLES

- A. Samples: Action Submittal: Submit to Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
 - 1. Submit to /Engineer for aesthetic, color, and finish selection.
 - 2. Submit Samples of finishes, textures, and patterns for Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Specification Sections; Engineer will retain two Samples.
- F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.09 OTHER SUBMITTALS

- A. Closeout Submittals: Comply with Section 017000 - Execution and Closeout Requirements.
- B. Informational Submittal: Submit data for Architect/Engineer's knowledge as Contract administrator or for Owner.

SECTION 013300 - SUBMITTAL PROCEDURES

- C. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

1.10 TEST REPORTS

- A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 CERTIFICATES

- A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product but must be acceptable to Engineer.

1.12 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.13 MANUFACTURER'S FIELD REPORTS

- A. Informational Submittal: Submit reports for Engineer's knowledge as Contract administrator or for Owner.
- B. Submit report in duplicate within 3 days of observation to Engineer for information.
- C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.14 ERECTION DRAWINGS

- A. Informational Submittal: Submit Drawings for Engineer's knowledge as Contract administrator or for Owner.

SECTION 013300 - SUBMITTAL PROCEDURES

- B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

1.15 CONSTRUCTION PHOTOGRAPHS

- A. Provide photographs of Site and construction throughout progress of Work produced by photographer acceptable to Engineer.
- B. At bi-weekly progress meetings submit photographs.
- C. Photographs: digital copy with accompanying description.
- D. Take sufficient number of site photographs from different directions both interior and exterior (minimum of 5 per bi-weekly meeting) photographs of site indicating relative progress of the Work, two days maximum before submitting.
- E. Take photographs as evidence of existing Project conditions:
- F. Identify each print on front. Identify name of Project, Contract number phase orientation of view, date and time of view, name and address of photographer, and photographer's numbered identification of exposure.
- G. Digital Images: Deliver complete set of digital image electronic files on CD-ROM to Engineer for review with Project record documents. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as sensor, uncropped.
 - 1. Digital Images: Uncompressed TIFF format, produced by digital camera with minimum sensor size of 4.0 megapixels, and image resolution of not less than 1024 by 768 pixels.
 - 2. Date and Time: Include date and time in filename for each image.

1.16 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to Engineer.
- B. Contractor: Responsible for:
 - 1. Determination and verification of materials including manufacturer's catalog numbers.
 - 2. Determination and verification of field measurements and field construction criteria.
 - 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 - 4. Determination of accuracy and completeness of dimensions and quantities.
 - 5. Confirmation and coordination of dimensions and field conditions at Site.
 - 6. Construction means, techniques, sequences, and procedures.
 - 7. Safety precautions.

SECTION 013300 - SUBMITTAL PROCEDURES

- 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Engineer.

1.17 ARCHITECT/ENGINEER REVIEW

- A. Do not make "mass submittals" to Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 20 or more submittals or items in one week. If "mass submittals" are received, Engineer's review time stated above will be extended as necessary to perform proper review. Engineer will review "mass submittals" based on priority determined by Engineer after consultation with Owner and Contractor.
- B. Informational submittals and other similar data are for Engineer's information, do not require Engineer's responsive action, and will not be reviewed or returned with comment.
- C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.
- D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, Engineer's Supplemental Instruction Field Order, or Construction Work Change Directive.

1.18 SHOP DRAWING PROCEDURES

- A. Shop Drawing procedures shall conform to requirements described in this Section.
- B. Submittals of Shop Drawings shall be made to the Engineer at the address listed in the Advertisement for Bids.
- C. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section.
- D. Copies of submittals shall be sent to the Erie County Water Authority at the Service Center Address at 3030 Union Road, Buffalo, New York 14227 and Owner at the Time Contractor submits to Engineer.
- E. At the beginning of each letter of transmittal provide a reference heading indicating the following:
 - 1. Owner's Name _____
 - 2. Project Name _____
 - 3. Contract No. _____
 - 4. Transmittal No. _____
 - 5. Section No. _____

SECTION 013300 - SUBMITTAL PROCEDURES

- F. If a Shop Drawing deviates from the requirements of the Contract Documents, Contractor shall specifically note each variation in his letter of transmittal.
- G. All Shop Drawings submitted for review shall have a title block with complete identifying information satisfactory to Engineer.
- H. All Shop Drawings submitted shall bear the stamp of approval and signature of Contractor as evidence that they have been reviewed by Contractor. Submittals without this stamp of approval will not be reviewed by Engineer and will be returned to Contractor. Contractor's stamp shall contain the following minimum information:

Project Name: _____
Contractor's Name: _____
Date: _____
-----Reference-----
Item: _____
Specifications:
Section: _____
Page No.: _____
Para. No.: _____
Drawing No.: _____ of _____
Location: _____
Submittal No.: _____
Approved By: _____

- I. A number shall be assigned to each submittal by Contractor starting with No. 1 and thence numbered consecutively. Resubmittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.
- J. The CONTRACTOR shall initially submit to ENGINEER a minimum of 4 copies of all submittals that are on 8¹/₂-inch by 11-inch or smaller sheets, and one unfolded sepia and 2 prints made from that sepia for all submittals on sheets larger than 8¹/₂-inch by 11-inch. The OWNER and ENGINEER shall receive one copy only of each submittals which will be stamped "Preliminary - Not For Construction."
- K. After ENGINEER completes his review, Shop Drawings will be marked with one of the following notations:
 - 1. Approved.
 - 2. Approved as Corrected.
 - 3. Revise and Resubmit.
 - 4. Not Approved.
 - 5. Submitted for Information.
- L. If a submittal is acceptable, it will be marked "Approved" or "Approved as Corrected". Four prints or copies of the submittal will be returned to CONTRACTOR.
- M. Upon return of a submittal marked "Approved" or "Approved as Corrected", CONTRACTOR may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.

SECTION 013300 - SUBMITTAL PROCEDURES

- N. If a Shop Drawing marked "Approved as Corrected" has extensive corrections or corrections affecting other drawings or Work, ENGINEER may require that CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for record purposes. Such drawings will have the notation, "Approved as Corrected - Resubmit."
- O. If a submittal is unacceptable, 2 copies will be returned to CONTRACTOR with one of the following notations:
1. "Revise and Resubmit"
 2. "Not Approved"
- P. Upon return of a submittal marked "Revise and Resubmit", CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure. The "Not Approved" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, CONTRACTOR shall repeat the initial approval procedure utilizing acceptable material or equipment.
- Q. Any related Work performed or equipment installed without an "Approved" or "Approved as Corrected" Shop Drawing will be at the sole responsibility of the CONTRACTOR.
- R. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after data covering such is reviewed. Contractor shall assume the risk for all materials or equipment which are fabricated or delivered prior to the review of Shop Drawings. Materials or equipment will not be included in periodic progress payments until review thereof has been obtained in the specified manner.
- S. Engineer will review and process all submittals promptly, but a reasonable time should be allowed for this, for the Shop Drawings being revised and resubmitted, and for time required to return the reviewed Shop Drawings to Contractor.
- T. It is Contractor's responsibility to review submittals made by his suppliers and Subcontractors before transmitting them to Engineer to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for Engineer to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.
- U. Contractor shall furnish required submittals with complete information and accuracy in order to achieve required review of an item within three submittals. All costs to Engineer involved with subsequent submittals of Shop Drawings, Samples or other items requiring review, will be backcharged to Contractor, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due Contractor for Work completed. In the event that Contractor requests a substitution for a previously reviewed item, all of Engineer's costs in the reviewing of the substitution will be backcharged to Contractor unless the need for such substitution is beyond the control of Contractor.

SECTION 013300 - SUBMITTAL PROCEDURES

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 013310 - SUBSTITUTIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description
- B. Contractor's Options
- C. Substitutions

1.02 DESCRIPTION

- A. Requests for review of a substitution shall conform to these requirements and shall contain complete data substantiating compliance of proposed substitution with Contract Documents.

1.03 CONTRACTOR'S OPTIONS

- A. For materials or equipment (hereinafter products) specified only by reference standard, select product meeting that standard, by any manufacturer, fabricator, supplier or distributor (hereinafter manufacturer). To the maximum extent possible, provide products of the same generic kind from a single source.
- B. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named which complies with Specifications.
- C. For products specified by naming one or more products or manufacturers and stating "or equal", submit a request for a substitution for any product or manufacturer which is not specifically named.
- D. For products specified by naming only one product or manufacturer and followed by words indicating that no substitution is permitted, there is no option and no substitution will be allowed.
- E. Where more than one choice is available as a Contractor's option, select product which is compatible with other products already selected or specified.

1.04 SUBSTITUTIONS

- A. During a period of 30 days after date of commencement of Contract Time, Engineer will consider written requests from Contractor for substitution of products or manufacturers, and construction methods (if specified).
 - 1. After end of specified period, requests will be considered only in case of unavailability of product or other conditions beyond control of Contractor.

SECTION 013310 - SUBSTITUTIONS

- B. Owner will withhold monies due to Contractor to cover additional Engineer's costs associated with requests for substitution.
- C. Submit 5 copies of request for substitution. Submit separate request for each substitution. Include in request the following:
 - 1. For products or manufacturers:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature with product description, performance and test data, and reference standards.
 - c. Samples, if appropriate.
 - d. Name and address of similar projects on which product was used, and date of installation.
 - 2. For construction methods (if specified):
 - a. Detailed description of proposed method.
 - b. Drawings illustrating method.
 - 3. Such other data as the Engineer may require to establish that the proposed substitution is equal to the product, manufacturer or method specified.
- D. In making request for substitution, Contractor represents that:
 - 1. Contractor has investigated proposed substitution, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified.
 - 2. Contractor will provide the same or better guarantees or warranties for proposed substitution as for product, manufacturer or method specified.
 - 3. Contractor waives all claims for additional costs or extension of time related to proposed substitution that subsequently may become apparent.
- E. A proposed substitution will not be accepted if:
 - 1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.
 - 2. It will delay completion of the Work, or the work of other contractors.
 - 3. It is indicated or implied on a Shop Drawing and is not accompanied by a formal request for substitution from Contractor.
- F. If the Engineer determines that a proposed substitute is not equal to that specified, Contractor shall furnish the product, manufacturer or method specified at no additional cost to Owner.
- G. Approval of a substitution will not relieve Contractor from the requirement for submittals as set forth in the Contract Documents.

SECTION 013310 - SUBSTITUTIONS

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 013310 - SUBSTITUTIONS

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SECTION 013543 - ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. CONTRACTOR shall comply with all Federal, State, and local Laws and Regulations related to environmental protection and environmental safety including, but not limited, to the following:
1. Title 29 Code of Federal Regulations Parts 1910, Occupational Safety and Health.
 2. Title 40 Code of Federal Regulations, Environmental Protections.
 3. Title 49 Code of Federal Regulations, Transportation.
 4. State Occupational Safety and Health Administration (OSHA).
- B. In order to ensure the OWNER that CONTRACTOR is complying with the intent of the regulations stated in Paragraph 1.1.A, above, as they relate to the on-site use of hazardous materials, hazardous wastes and other substances similarly defined in those regulations, CONTRACTOR shall develop and maintain a CONTRACTOR'S Hazardous Materials Management Program that includes as a minimum, but is not limited to the requirements specified herein. The interests of the OWNER are that accidental spills, Site contamination, and injury of personnel on the Site are avoided. OWNER will not enforce suspected violations of the rules and regulations referenced in Paragraph 1.1.A, above, however the OWNER will notify CONTRACTOR of suspected violations. If in the opinion of the OWNER, CONTRACTOR fails to address the suspected violations in a timely and appropriate manner, OWNER will notify Federal, State, or local regulatory agencies, report the suspected violations to them, and request that they inspect CONTRACTOR'S operations. Any fines that may be levied against OWNER for violations committed on the Site by CONTRACTOR as well as any costs to OWNER associated with cleanup of materials shall be reimbursed immediately by CONTRACTOR. All documents required by the program shall be made available to the OWNER'S Environmental Representative immediately, upon request.
- C. Any hazardous waste, as defined in any of the above listed regulations, generated by CONTRACTOR shall be the responsibility of CONTRACTOR. If CONTRACTOR is going to generate, or has generated, a substance that qualifies as a hazardous waste, CONTRACTOR shall obtain an EPA identification number, listing CONTRACTOR'S name and construction Site address as the generator of the hazardous waste. CONTRACTOR shall be responsible for the identification, analysis, profiling, transport and disposal of hazardous wastes generated. The identification number can be obtained from the New York State Department of Environmental Conservation. This number shall be provided to the ENGINEER within 5 days after the Notice to Proceed, or before any hazardous materials are brought onto the Site.

1.02 HAZARDOUS MATERIALS MANAGEMENT PROGRAM REQUIREMENTS

- A. Within the regulations listed in Paragraph 1.1.A, above, terms such as hazardous material, hazardous wastes, and similar terms have varying definitions. To dispel confusion regarding what materials fall under the Program Requirements and for the purposes of this Article, Hazardous Material is defined as "any material, whether solid, semi-solid, liquid, or gas, which, if not stored or used properly, may cause harm or injury to persons through inhalation, ingestion, absorption or injection, or which may negatively impact the

SECTION 013543 - ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

environment through the use or discharge of the material on the ground, in the water (including groundwater), or to the air."

- B. All chemicals brought onto the Site must be approved by OWNER. Prior to bringing any chemical onto the Site, CONTRACTOR shall request approval from OWNER'S Environmental Representative for each chemical CONTRACTOR proposes to bring onto the Site. At the time of request, OWNER'S Environmental Representative may request and receive from CONTRACTOR, specific information associated with each chemical. The specific information may include, but is not limited to, MSDS, manufacture, vendor, container size(s), number of containers, minimum and maximum volume of material intended to be stored on-site, as well a description to the process or procedures in which any requested chemical is to be used. OWNER, within 5 days from receipt of the specific chemical information, will inform CONTRACTOR as to whether the chemical has been approved for use on-site.
- C. CONTRACTOR shall, in accordance with applicable Laws and Regulations, develop a Hazardous Materials Communication Plan. At a minimum, CONTRACTOR shall maintain on-site two notebooks containing (1), a chemical inventory, and (2), current (dated within the past two years) Material Safety Data Sheets for all materials being used on-site, whether or not they are defined as a Hazardous Material in Paragraph 1.2.A, above. One notebook shall be kept in CONTRACTOR'S on-site office and the other shall be kept in a location specified by the OWNER'S Environmental Representative. These notebooks must be kept up-to-date as materials are brought onto and removed from the Site. Copies of MSDS sheets for chemicals removed from the Site shall be provided to the OWNER'S Environmental Representative.
- D. CONTRACTOR shall develop an emergency/spill response plan, for each hazardous material or class/group of materials. As a minimum, the response plan must address the following:
 - 1. Provide a description of equipment on-site available to contain or respond to an emergency/spill of the material.
 - 2. Notification procedures.
 - 3. Response coordination procedures between CONTRACTOR, OWNER, and ENGINEER.
 - 4. Provide a Site Plan showing the location of stored hazardous materials and location of spill containment/response equipment.
 - 5. Provide a description of the hazardous material handling and spill response training provided to CONTRACTOR'S employees.
- E. CONTRACTOR shall, in accordance with applicable Laws and Regulations, properly and safely store all hazardous materials, which shall include as a minimum, the following:
 - 1. Have a designated storage site for hazardous materials that includes secondary containment. The Site must include barriers to prevent vehicles from colliding with the storage containers and offer protection from environmental factors such as weather.
 - 2. Provide signage in accordance with applicable Laws and Regulations, clearly identifying the hazardous materials storage site.
 - 3. All hazardous materials containers must bear the applicable Hazard Diamonds.

SECTION 013543 - ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

- F. CONTRACTOR shall properly label all containers of consumable materials, whether or not they are classified as Hazardous Materials under this Section. The name of CONTRACTOR or subcontractor shall be stenciled on any container containing a hazardous material and on any container over five-gallon capacity containing a non-hazardous material. Any container must have a label clearly identifying the contents. If any such unlabeled containers are discovered on the Site, the OWNER'S Environmental Representative will notify CONTRACTOR, and CONTRACTOR will within one hour properly label the container or remove it from the Site. Any containers that are filled from larger containers must also be properly labeled.
- G. OWNER encourages storage of hazardous materials off-site until the materials are needed on-site.
- H. CONTRACTOR shall provide all documentation required herein available upon request of OWNER'S Environmental Representative immediately upon request of OWNER'S Environmental Representative. CONTRACTOR'S Safety Representative will meet at least monthly with OWNER'S Environmental Representative to review CONTRACTOR'S Hazardous Materials Management Program documents, procedures, and inspect the storage site and the Site to ensure the requirements specified herein are being complied with. CONTRACTOR shall also provide OWNER'S Environmental Representative and the ENGINEER with copies of all permits obtained from environmental regulatory agencies.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Quality control.
- B. Tolerances.
- C. References.
- D. Labeling.
- E. Mockup requirements.
- F. Testing and inspection services.
- G. Manufacturers' field services.

1.02 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Products, materials, and equipment may be subject to inspection by Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

SECTION 014000 - QUALITY REQUIREMENTS

1.04 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current as of date for receiving Bids except where specific date is established by code.
- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.05 LABELING

- A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
 - 1. Model number.
 - 2. Serial number.
 - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.06 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.
- B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mockups shall be comparison standard for remaining Work.
- D. Where mockup has been accepted by Engineer and is specified in product Specification Sections to be removed, remove mockup and clear area when directed to do so by Engineer.

SECTION 014000 - QUALITY REQUIREMENTS

1.07 TESTING AND INSPECTION SERVICES

- A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection.
- B. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Engineer.
 - 1. Laboratory: Authorized to operate at Project location in State of New York.
 - 2. Laboratory Staff: Maintain full-time Professional Engineer or specialist on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Engineer or Owner at no additional cost to the Owner.
- D. Reports shall be submitted by independent firm to Engineer, Contractor, and authorities having jurisdiction, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
 - 1. Submit final report indicating correction of Work previously reported as noncompliant.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
 - 1. Notify Engineer and independent firm 48 hours before expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.
- F. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.
- G. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Engineer. Payment for retesting or re-inspection will be the responsibility of the Contractor, no claim for additional costs from the Contractor will be accepted.
- H. Agency Responsibilities:
 - 1. Test Samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at Site. Cooperate with Engineer and Contractor in performance of services.
 - 3. Perform indicated sampling and testing of products according to specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Engineer and Contractor of observed irregularities or nonconformance of Work or products.

SECTION 014000 - QUALITY REQUIREMENTS

6. Perform additional tests required by Engineer.
 7. Attend preconstruction meetings and progress meetings.
- I. Agency Reports: After each test, promptly submit one copy of report to Engineer, Contractor, and authorities having jurisdiction. When requested by Engineer, provide interpretation of test results. Include the following:
1. Date issued.
 2. Project title and number.
 3. Name of inspector.
 4. Date and time of sampling or inspection.
 5. Identification of product and Specification Section.
 6. Location in Project.
 7. Type of inspection or test.
 8. Date of test.
 9. Results of tests.
 10. Conformance with Contract Documents.
- J. Limits on Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

1.08 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, assist with startup of equipment, testing, adjusting, and balancing of equipment and commissioning as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer is subject to approval of Engineer.
- C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Refer to Section 013300 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. References
- B. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Temporary lighting.
 - 3. Temporary water service.
 - 4. Temporary sanitary facilities.
- C. Construction Facilities:
 - 1. Field offices and sheds.
 - 2. Vehicular access.
 - 3. Progress cleaning and waste removal.
 - 4. Fire-prevention facilities.
- D. Temporary Controls:
 - 1. Enclosures and fencing.
 - 2. Security.
 - 3. Water control.
 - 4. Dust control.
 - 5. Erosion and sediment control.
 - 6. Noise control.
- E. Removal of utilities, facilities, and controls.

1.02 REFERENCES

- A. ASTM International:
 - 1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

2. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.03 TEMPORARY GENERAL CONSTRUCTION ELECTRICITY

- A. Use Owner's existing power service, unless otherwise noted.
- B. Complement existing power service capacity and characteristics as required for construction operations.
- C. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment.
- D. Provide main service disconnect and overcurrent protection at convenient location feeder switch at source distribution equipment, and/or meter as field required.
- E. Permanent convenience receptacles may be used during construction.
- F. Provide distribution equipment, wiring, and outlets for single-phase branch circuits for power and lighting.
 1. Provide 20-ampere duplex outlets, single-phase circuits for power tools as needed in active work area.
 2. Provide 20-ampere, single-phase branch circuits for lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain building incandescent lighting for construction operations to achieve minimum lighting level of 2 watts/sq ft.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, lamps, and the like, for specified lighting levels.
- C. Maintain lighting and provide routine repairs.
- D. Permanent building lighting shall not be used during rough construction.

1.05 TEMPORARY WATER SERVICE

- A. Use Owner's existing water service, unless otherwise noted. Connect using a backflow preventer.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

1.06 TEMPORARY SANITARY FACILITIES

- A. Use Owner's existing facilities, unless otherwise noted.

1.07 FIELD OFFICES AND SHEDS

- A. A staging area for the Contractor is shown on the drawings and is for Contractor field offices, storage and employee parking.
- B. Provide Engineer's Field Office: General Contractor shall provide a desk, chair, table filing cabinet and combination printer/scanner in the Conference Room in the Sturgeon Point Filter Building for use by the Engineer. Provide cellular telephone and service for the Engineer's construction inspector for the duration of the project.
- C. Project meetings will be held in the Conference Room in the Sturgeon Point Filter Building.
- D. Locate field offices and sheds a minimum distance as delineated on Contract Drawings from existing and new structures.
- E. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 016000 - Product Requirements.
- F. Preparation: Fill and grade Sites for temporary structures sloped for drainage away from buildings.
- G. Installation:
 - 1. Install field office spaces ready for occupancy 10 days after date established by Notice to Proceed.
 - 2. Employee Residential Occupancy: Not allowed on Owner's property.
- H. Maintenance and Cleaning:
 - 1. Weekly janitorial services for field offices; periodic cleaning and maintenance for sheds and storage areas.
 - 2. Maintain walks free of mud, water, snow, and the like.
- I. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.08 VEHICULAR ACCESS

- A. Provide unimpeded access for emergency vehicles. Maintain 15 foot-wide driveways with turning space between and around combustible materials.
- B. Provide and maintain access to fire hydrants and control valves free of obstructions.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Use designated existing on-Site roads for construction traffic.

1.09 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from Site weekly and dispose of off-Site.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 FIRE-PREVENTION FACILITIES

- A. Prohibit smoking within buildings. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.
- B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

1.11 ENCLOSURES AND FENCING

- A. Construction: Commercial-grade chain-link fence.
- B. Provide 8-foot-high fence around construction Site as necessary when existing fence is temporarily removed for construction activities; equip with vehicular and pedestrian gates with locks.
- C. Exterior Enclosures:
 - 1. Provide temporary insulated weathertight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual Specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

1.12 SECURITY

A. Security Program:

1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
2. Initiate program in coordination with Owner's existing security system at Project mobilization.
3. Maintain program throughout construction period until Owner's acceptance precludes need for Contractor's security.

B. Entry Control:

1. Restrict entrance of persons and vehicles to Project Site and existing facilities.
2. Allow entrance only to authorized persons with proper identification.
3. Maintain log of workers and visitors and make available to Owner on request.
4. Owner will control entrance of persons and vehicles related to Owner's operations.
5. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.

C. Personnel Identification:

1. Provide identification badge for each person authorized to enter premises.
2. Badge to Include: Personal photograph, name, and employer.
3. Maintain list of accredited persons and submit copy to Owner on request.
4. Require return of badges at expiration of employment on the Work.

D. Vehicle Identification:

1. All Contractor vehicles, including employee vehicles, shall display a vehicle identification tag clearly visibly located on the dashboard. The vehicle tag shall be issued by the Contractor and shall include the following information: site name, Contractor name, contract number, vehicle license plate number, state of issue, name and employer of vehicle owner and vehicle owner contact telephone number.

E. Security Service:

1. Facility to be fenced off and locked when no workers or operator is on-site.
2. Coordinate with Owner and operator for securing site when operator is not present.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

F. Restrictions:

1. Do not allow cameras on Site or photographs taken except by written approval of Owner.

G. Contingency Allowance:

1. The contingency allowance included in the Contract includes costs for the services of a security firm to provide a security guard house and guard at the plant site during normal business hours to monitor vehicles and personnel entering and exiting the site that are involved with the Contractor's Work. This allowance would be utilized only if the Owner elects to provide these site security services.
2. This is for security related to site access only. If the Owner does not elect to provide this site access security service, it in no way releases the Contractor from the responsibilities of Article 1.12 of this Section. The costs for all other site security outlined in Article 1.12 shall be the responsibility of the Contractor and is not part of the contingency allowance for site access security services.

1.13 WATER CONTROL

- A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.
- B. Protect Site from puddles or running water. Provide water barriers as required to protect Site from soil erosion.

1.14 DUST CONTROL

- A. Execute Work by methods that minimize raising dust from construction operations.
- B. Provide positive means to prevent airborne dust from dispersing into atmosphere and into Owner-occupied areas.

1.15 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize surface area of bare soil exposed at one time.
- C. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts and clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation. Promptly apply corrective measures.

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

- F. Comply with sediment and erosion control plan indicated on Drawings.

1.16 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.17 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials before Final Application for Payment inspection.
- B. Remove underground installations to minimum depth of 2 feet. Grade Site as indicated on Drawings.
- C. Clean and repair damage caused by installation or use of temporary Work.
- D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

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SECTION 015519 – TEMPORARY PARKING AND STAGING AREAS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Scope of Work.
- B. Description of Work.
- C. Permits and Regulations

1.02 SCOPE OF WORK

- A. During construction activities, the Contractor shall park within designated areas as determined by the Owner.
- B. Contractor shall stage equipment, materials, and field offices in staging areas designated prior to construction.
- C. The staging area is shown on the drawings and is for use by the Contractor.

1.03 DESCRIPTION OF WORK

- A. Temporary Parking Areas:
 - 1. At the site, temporary stone with geotextile fabric may be placed in grass area(s) for additional parking areas and/or turn around areas as approved by the Owner.
 - 2. Contractor shall leave sufficient space for plant operator and other staff to park and access the site as necessary.
- B. Staging Areas:
 - 1. Contractor shall stage equipment, materials, and field offices in designated staging areas, as directed by the Owner.
- C. Restoration
 - 1. At the end of the project the Contractor shall remove all temporary parking and staging areas and restore to acceptable standards per contract documents or as directed by the Owner.

1.04 PERMITS AND REGULATIONS

- A. The Contractor shall comply with all municipal, County, State and Federal regulations relating to safety, noise and air pollution and shall apply for, obtain and pay all costs in connection with permits as may be required.

PART 2 - PRODUCTS - NOT APPLICABLE

PART 3 – EXECUTION – NOT APPLICABLE

END OF SECTION

SECTION 015519 – TEMPORARY PARKING AND STAGING AREAS

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SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description
- B. Barricades and Warning Signals
- C. Tree and Plant Protection
- D. Protection of Existing Structures
- E. Protection of Floors, Roofs, and Ceilings
- F. Protection of Installed Products and Landscaping

1.02 DESCRIPTION

- A. Contractor shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.
- B. In order to prevent damage, injury or loss, Contractor's actions shall include, but not be limited to, the following:
 - 1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
 - 2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, environmental contamination, or otherwise.
 - 3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
 - 4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
 - 5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.
- C. Contractor shall not, except after written consent from proper parties, enter or occupy privately-owned land with men, tools, materials or equipment, except on easements provided herein.
- D. Contractor shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the Contractor, it shall be restored by the Contractor, at his expense, to a condition equal to that existing before the damage was done.

SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

1.03 BARRICADES AND WARNING SIGNALS

- A. Where Work is performed on or adjacent to any roadway, right-of-way, or public place, Contractor shall provide barricades, fences, lights, warning signs, danger signals, watchmen, and shall take other precautionary measures for the protection of persons or property and of the Work. Barricades shall be painted to be visible at night. From sunset to sunrise, Contractor shall furnish and maintain at least one light at each barricade. Sufficient barricades shall be erected to keep vehicles from being driven on or into Work under construction. Contractor shall furnish watchmen in sufficient numbers to protect the Work. Contractor's responsibility for the maintenance of barricades, signs, lights, and for providing watchmen shall continue until the Project is accepted by Owner.

1.04 TREE AND PLANT PROTECTION

- A. Contractor shall protect existing trees, shrubs and plants on or adjacent to the site that are shown or designated to remain in place against unnecessary cutting, breaking or skinning of trunk, branches, bark or roots.
- B. Materials or equipment shall not be stored or parked within the drip line.
- C. Temporary fences or barricades shall be installed to protect trees and plants in areas subject to traffic.
- D. Fires shall not be permitted under or adjacent to trees and plants.
- E. Within the limits of the work, water trees and plants that are to remain, in order to maintain their health during construction operations.
- F. Cover all exposed roots with burlap that shall be kept continuously wet. Cover all exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, run-off or noxious materials in solution.
- G. If branches or trunks are damaged, prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by the Engineer.
- H. All damaged trees and plants that die or suffer permanent injury shall be removed when ordered by the Engineer and replaced by a specimen of equal or better quality.
- I. Coordinate work in this section with requirements of Division 2 Technical Specifications.

1.05 PROTECTION OF EXISTING STRUCTURES

- A. Underground Structures:
 - 1. Underground structures are defined to include, but not be limited to, all sewer, water, gas, and other piping, and manholes, chambers, electrical conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.

SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

2. All underground structures known to Engineer except water, sewer, electric, and telephone service connections are shown. This information is shown for the assistance of Contractor in accordance with the best information available, but is not guaranteed to be correct or complete.
3. Contractor shall explore ahead of his trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If Contractor damages an underground structure, he shall restore it to original condition at his expense.
4. Necessary changes in the location of the Work may be made by Engineer, to avoid unanticipated underground structures.
5. If permanent relocation of an underground structure or other subsurface facility is required and is not otherwise provided for in the Contract Documents, Engineer will direct Contractor in writing to perform the Work, which shall be paid for under the provisions of the General Conditions.

B. Surface Structures:

1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

C. Protection of Underground and Surface Structures:

1. Contractor shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, Contractor shall satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.
2. Contractor shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits of the Work. Contractor shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. Contractor shall repair immediately all damage caused by his work, to the satisfaction of the owner of the damaged structure.

- D. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at Contractor's expense.

1.06 PROTECTION OF FLOORS, ROOFS, AND CEILINGS

- A. Contractor shall protect floors, roofs and ceilings during the entire construction period.

SECTION 015620 - PROTECTION OF THE WORK AND PROPERTY

- B. Proper protective covering shall be used when moving heavy equipment, handling materials or other loads, when painting, handling mortar and grout and when cleaning walls and ceilings.
- C. Use metal pans to collect all oil and cuttings from pipe, conduit, or rod threading machines and under all metal cutting machines.
- D. Roofs and ceilings shall not be loaded without written permission of the Engineer.

1.07 PROTECTION OF INSTALLED PRODUCTS AND LANDSCAPING

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.
- B. Control traffic to prevent damage to equipment, materials and surfaces.
- C. Provide coverings to protect equipment and materials from damage.
 - 1. Cover projections, wall corners, and jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Installation data.

1.02 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- E. Furnish interchangeable components from same manufacturer for components being replaced.

1.03 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products according to manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.04 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.

SECTION 016000 - PRODUCT REQUIREMENTS

- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection unless otherwise approved by Owner.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.05 PRODUCT OPTIONS

- A. Refer to Section 013310 – Substitution Procedures.

1.06 INSTALLATION DATA

- A. Installation data is defined as written instruction; drawings; illustrative, wiring and schematic diagrams; diagrams identifying external connections, terminal block numbers and internal wiring; and all other such information pertaining to the location of materials and equipment that is not furnished with Shop Drawings. Included are all printed manufacturers installation instructions, including those that may be attached to equipment and for which review by the Engineer is not required.
- B. Contractor shall submit two copies of all such data to the Engineer for each piece of equipment which he furnished and for all other construction products for which such information is available from the manufacturer. Data shall be acceptably identified and accompanied with a letter of transmittal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Field engineering.
- B. Closeout procedures.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Testing, adjusting, and balancing.
- F. Project record documents.
- G. Operation and maintenance data.
- H. Manual for equipment and systems.
- I. Spare parts and maintenance products.
- J. Product warranties and product bonds.
- K. Maintenance service.
- L. Examination.
- M. Preparation.
- N. Execution.
- O. Cutting and patching.
- P. Protecting installed construction.
- Q. Final cleaning.

1.02 FIELD ENGINEERING

- A. Employ land surveyor registered in State of New York and acceptable to Engineer.
- B. Locate and protect survey control and reference points. Promptly notify Engineer of discrepancies discovered.
- C. Control datum for survey is per NAD83 and NGVD29 and New York State Plane Coordinates as indicated on Drawings.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- D. Prior to beginning Work, verify and establish floor elevations of existing facilities to ensure that new Work will meet existing elevations in smooth and level alignment except where specifically detailed or indicated otherwise.
- E. Verify setbacks and easements; confirm Drawing dimensions and elevations.
- F. Provide field engineering services. Establish elevations, lines, and levels using recognized engineering survey practices.
- G. Submit copy of Site drawings signed by land surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.
- H. Maintain complete and accurate log of control and survey Work as Work progresses.
- I. On completion of foundation walls and major Site improvements, prepare certified survey illustrating dimensions, locations, angles, and elevations of construction and Site Work.
- J. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.
- K. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.
- L. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect/Engineer.
- M. Final Property Survey: Prior to Substantial Completion, prepare final property survey illustrating locations, dimensions, angles, and elevations of buildings and Site Work that have resulted from construction indicating their relationship to permanent bench marks and property lines.
 - 1. Show significant features (real property) for Project.
 - 2. Include certification on survey, signed by surveyor, that principal metes, bounds, lines, levels, and elevations of Project are accurately shown.

1.03 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.
 - 2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
 - 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.

4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
6. Make final change-over of locks eliminating construction master-key system and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
8. Perform final cleaning according to this Section.

B. Substantial Completion Inspection:

1. When Contractor considers Work to be substantially complete, submit to Engineer Owner:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).
2. Within seven days after receipt of request for Substantial Completion, Engineer will make inspection to determine whether Work or designated portion is substantially complete.
3. Should Engineer determine that Work is not substantially complete:
 - a. Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Engineer.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.
4. When Engineer's finds that Work is substantially complete, Engineer will:
 - a. Prepare Certificate of Substantial Completion on EJCDC C-625 - Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- b. Complete Work listed for completion or correction within time period stipulated.
 6. Owner will occupy all of building as specified in Section 011000 - Summary.
- C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
1. When Contractor considers Work to be complete, submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
 2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 - e. Contractor's affidavit of payment of debts and claims on AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
 - f. Contractor affidavit of release of liens on AIA G706A - Contractor's Affidavit of Release of Liens.
 - g. Consent of surety to final payment on AIA G707 - Consent of Surety to Final Payment Form.
 3. Perform final cleaning for Contractor-soiled areas according to this Section.
- D. Final Completion Inspection:
1. Within seven days after receipt of request for final inspection, Engineer will make inspection to determine whether Work or designated portion is complete.
 2. Should Engineer consider Work to be incomplete or defective:
 - a. Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Engineer that Work is complete.
 - c. Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Engineer's inspection.

1.04 STARTING OF SYSTEMS

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

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- B. Notify Engineer and Owner seven days prior to startup of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.
- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.
- H. Submit a written report according to Section 013300 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.05 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate Project equipment and instruct Owner's personnel by manufacturer's representative who is knowledgeable about the Project.
- C. Video Recordings: Provide high-quality color video recordings of demonstration and instructional sessions. Engage commercial videographer to record sessions. Include classroom instructions, demonstrations, board diagrams, and other visual aids. Include menu navigation.
- D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location. Provide instructions at several times if needed to accommodate shift schedules.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- H. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

1.06 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
 - 1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
 - 2. Include locations of concealed elements of the Work.
 - 3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
 - 4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
 - 5. Identify and locate existing buried or concealed items encountered during Project.
 - 6. Measured depths of foundations in relation to finish main floor datum.
 - 7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 9. Field changes of dimension and detail.
 - 10. Details not on original Drawings.
- G. Submit marked-up paper copy documents to Engineer before Substantial Completion.
- H. Submit final PDF electronic files of documents to Engineer with claim for final Application for Payment.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

1.07 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by process flow and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - g. Safety precautions to be taken when operating and maintaining or working near equipment.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop Drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties.

1.08 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- B. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes before Substantial Completion. Draft copy be reviewed and returned after Substantial Completion, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit three sets of revised final volumes within ten days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- F. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom-manufactured products.
- G. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- H. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- I. Additional Requirements: As specified in individual product Specification Sections.
- J. Include listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.09 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes before Substantial Completion. Draft copy will be reviewed and returned after Substantial Completion, with Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit three sets of revised final volumes within ten days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.
- F. Each Item of Equipment and Each System: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- G. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.
- H. Include color-coded wiring diagrams as installed.
- I. Operating Procedures: Include startup, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.
- J. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- K. Include servicing and lubrication schedule and list of lubricants required.
- L. Include manufacturer's printed operation and maintenance instructions.
- M. Include sequence of operation by controls manufacturer.
- N. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- O. Include control diagrams by controls manufacturer as installed.
- P. Include Contractor's coordination drawings with color-coded piping diagrams as installed.
- Q. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- R. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- S. Include test and balancing reports as specified in Section 014000 - Quality Requirements.
- T. Additional Requirements: As specified in individual product Specification Sections.
- U. Include listing in table of contents for design data with tabbed dividers and space for insertion of data.

1.10 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.
- B. Deliver to place in location as directed by Owner; obtain receipt prior to final payment.

1.11 PRODUCT WARRANTIES AND PRODUCT BONDS

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

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include table of contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.12 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in Specification Sections during warranty period.
- B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.
- D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Specification Sections.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

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

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.03 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
 - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 - 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect/Engineer for final decision.
- E. Allow for expansion of materials and building movement.
- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
 - 1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 - 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
 - 1. Refer questionable mounting heights choices to Architect/Engineer for final decision.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- H. Adjust operating products and equipment to ensure smooth and unhindered operation.
- I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.04 CUTTING AND PATCHING

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight-exposed elements.
 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed Work.
 3. Remove and replace defective and nonconforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products according to requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- J. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

3.05 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

3.06 FINAL CLEANING

- A. Execute final cleaning prior to final Project assessment.
 - 1. Employ experienced personnel or professional cleaning firm.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces.
- C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean Site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

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SECTION 019100 - COMMISSIONING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall initially start-up and place all equipment installed into satisfactory operation, according to manufacturer's written instructions and as required by manufacturer's field representatives. Provide all material, labor, tools, and expendables as required.
- B. In addition to the testing required by this Section, Contractor shall perform all other tests required in detailed equipment specifications and testing specifications.
- C. At least 14 days prior to his proposed testing, the Contractor shall submit in writing to the Engineer a complete outline of his proposed procedure for testing. No testing shall begin until approval is given. Such approval shall be for the general schedules of testing and in no way relieves the Contractor of his responsibility for conducting the test expeditiously and with an adequate number of personnel to handle all emergencies.
- D. Only one Raw Water Screen or Raw Water Pump shall be out of service at any one time. All associated work (i.e., supports, painting, electrical equipment, etc.) and all phases of the Performance Testing shall be completed and approved before the next Screen or Pump is taken out of service.
- E. Related work specified elsewhere:
 - 1. Section 011000, Summary
 - 2. Section 013110, Coordination with Owner's Operations.

1.02 PHASE 1 PERFORMANCE TESTS

- A. After each Raw Water Screen or Raw Water Pump variable frequency drive, discharge valves, associated equipment, systems and appurtenances has been installed; the complete unit will be subject to Phase 1 Performance Tests under actual operating conditions. The results of the tests will be used to determine compliance with the specifications as to the operating characteristics, proper handling and installation.
- B. The Contractor shall notify the Engineer and Owner one week prior to the start of field testing.
- C. The tests shall be made by the Contractor under the direct supervision of a qualified representative of the manufacturer(s), and in the presence of, and as directed by the Engineer.
- D. The Contractor shall provide a checklist to record the results of the Performance Test. The tests shall demonstrate that under all conditions of operation, each unit:
 - 1. has not been damaged by transportation or installation;
 - 2. has been properly installed;

SECTION 019100 - COMMISSIONING

3. has no mechanical defects;
 4. has no electrical defects;
 5. is in proper alignment;
 6. has been properly connected;
 7. has functional instrumentation and control equipment;
 8. is free of overheating of any parts;
 9. is free of all objectionable vibration;
 10. is free of overloading of any parts;
 11. is free of all unusual/objectionable noise.
- E. Any defects in the equipment or installation or failure to meet the requirements of the Specifications shall be promptly corrected by replacement or as otherwise directed by the Engineer. The decision of the Engineer as to whether or not the Contractor has fulfilled his obligations under the Contract shall be final and conclusive. If the Contractor fails or refuses to make the required corrections, or if the improved equipment, when tested, shall again fail to meet the requirements of the Specifications, the Owner shall have the option of rejecting the equipment or of accepting the same at such reduced prices as may be agreed upon by the parties hereto.
- F. The Contractor shall, in the event of rejection of his equipment and upon release of any claim or interest of the Owner therein, repay all monies paid to him on account and shall remove the equipment or reimburse the Owner for all costs in connection with such removal and the Contractor agrees that the unsatisfactory equipment furnished by him shall remain in place and may be used by the Owner to the extent necessary, without rental or other charge, until other new equipment is obtained and replaces the rejected equipment.

1.03 PHASE 2 PERFORMANCE TESTS

- A. Each complete Raw Water Screen and Raw Water Pump variable frequency drive and discharge valves shall be subjected to Phase 2 Performance Tests.
- B. During the Performance Tests, the Contractor's personnel shall demonstrate, to the satisfaction of the Engineer, with Owner's personnel present, that all equipment is coordinated and operating properly; that all controls, safety features, and alarms operate satisfactorily in coordination with the equipment installed; and that the installed equipment complies in all respects mechanically and electrically with applicable Drawings and Specifications.
- C. The Performance Tests shall be concluded with a twenty-four-hour operational test of each unit completed based on the normal operation of the unit by the Owner.
- D. Performance Tests for each unit shall be considered concluded at the end of the twenty-four hour period designated for the tests, if the Owner is satisfied with the test results. In the event that the test results are unsatisfactory in the opinion of the Owner, the Owner reserves the right to have the Contractor rerun a portion or the entire test until, in the Owner's opinion, satisfactory results are obtained.
- E. After the Contractor receives from the Engineer written acceptance of the Final Performance Tests for each unit, the Contractor's responsibilities relative to operation of

SECTION 019100 - COMMISSIONING

that unit shall be concluded, and the Owner will assume the responsibility, in accordance with the Phase 3 Performance Tests.

- F. All operating costs, until satisfactory completion of the Phase 2 Performance Tests is achieved, shall be paid for by the Contractor and shall be included as a part of the lump sum and unit prices bid for work items set forth in the Proposal. Operating costs shall be understood to include, but not be limited to, the costs of lubricants, parts, and labor. The Contractor shall also be responsible for maintenance during the testing procedure. If the Contractor does not have sufficient personnel to handle an emergency and the Owner must make repairs with his own forces from damage caused by the Contractor's actions, the Contractor shall reimburse the Owner for this work. The calculation of Owner's costs and extent of damages to be reimbursed by Contractor will be at the sole discretion of the Engineer and Owner.
- G. The cost of utilities and the disposal of screenings material collected during the Phase 2 Performance Test shall be at the Owner's expense.

1.04 PHASE 3 PERFORMANCE TESTS

- A. Each complete Raw Water Screen and Raw Water Pump variable frequency drive and discharge valves shall be subjected to Phase 3 Performance Tests.
 - 1. All new equipment shall successfully complete a fourteen-day Phase 3 Performance Test.
 - 2. During the Performance Test, the units shall be operated by the Owner, via the SCADA system, and/or local controls, as if it were a part of the Owner's standard operating procedure.
 - 3. The Owner shall notify the Contractor one week prior to the start of the Performance Test.
 - 4. Failure of the mechanical, electrical, instrumentation or control equipment installed by the Contractor, as part of this Contract, to operate as specified shall constitute failure of the test. Failure of any one component of the equipment supplied by the Contractor shall constitute failure of the Performance Test.
 - 5. If failure of the Performance Test occurs at any time during the period, then the entire fourteen-day performance period shall start over. The Performance Test shall be restarted for as many times as necessary.
 - 6. If failure occurs, then the Contractor shall locate and correct the problem. The Contractor shall notify the Engineer when the problem has been corrected, and the fourteen-day Performance Test can again be started.
 - 7. The Engineer may categorize a failure occurrence as a "minor problem." In general, a "minor problem" is defined as a problem which can be completely corrected within two hours. It is up to the discretion of the Engineer and the Owner whether or not failure of the system was caused by a minor problem.
 - 8. If it is decided that failure of the system was caused by a minor problem, then the amount of downtime will be added on to the time remaining in the Performance Test.
 - 9. If the same minor problem occurs more than once during the Performance Test, then it shall be considered failure of the Performance Test.

SECTION 019100 - COMMISSIONING

10. Successful completion of the Phase 3 Performance Test for each unit constitutes the completion of that phase of the project, subject to all other terms and conditions of the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

DIVISION 2
EXISTING CONDITIONS

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Demolishing designated building equipment and fixtures.
 - 2. Demolishing designated construction.
 - 3. Cutting and alterations for completion of the Work.
 - 4. Removing designated items for reuse.
 - 5. Protecting items designated to remain.
 - 6. Removing demolished materials.

1.02 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Demolition Schedule: Indicate overall schedule and interruptions required for utility and building services.
- C. Shop Drawings:
 - 1. Indicate demolition and removal sequence.

1.03 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition, and subsurface obstructions.

1.04 QUALITY ASSURANCE

- A. Conform to Williams-Steiger Occupational Health and Safety Act of 1970 (Public Law 91596), as amended.
- B. Conform to NYSDOL Industrial Code Rules for procedures when hazardous or contaminated materials are discovered.
- C. Obtain permits, if required, from authorities having jurisdiction.

1.05 SEQUENCING

- A. Section 011000 - Summary: Requirements for sequencing.

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

- B. Sequence activities in accordance with the requirements for maintaining operations at the raw water pumping station.

1.06 SCHEDULING

- A. Section 013000 - Administrative Requirements and 013216 - Construction Progress Schedule: Requirements for scheduling.
- B. Schedule Work to coincide with new construction, and maintaining operations at the raw water pumping station.
- C. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation and activities in adjoining spaces on the grounds of the water treatment plant.

1.07 PROJECT CONDITIONS

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Cease operations immediately if structure appears to be in danger and notify Engineer. Do not resume operations until directed.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 PREPARATION

- A. Notify affected utility companies before starting work and comply with their requirements.
- B. Mark location and termination of utilities.
- C. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the public, Owner, and existing improvements indicated to remain.
- D. Erect and maintain weatherproof closures for exterior openings.
- E. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued Owner occupancy.
- F. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.
- G. Provide appropriate temporary signage including signage for exit or building egress.

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

- H. Do not close or obstruct building egress path.
- I. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

3.02 SALVAGE REQUIREMENTS

- A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.
- B. Tag components and equipment Owner designates for salvage.
- C. Protect designated salvage items from demolition operations until items can be removed.
- D. Carefully remove building components and equipment indicated to be salvaged.
- E. Disassemble as required to permit removal from building.
- F. Package small and loose parts to avoid loss.
- G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.
- H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.
- I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.03 DEMOLITION

- A. Conduct demolition to minimize interference with adjacent and occupied building areas.
- B. Maintain protected egress from and access to adjacent existing buildings at all times.
- C. Do not close or obstruct roadways and sidewalks without permits.
- D. Cease operations immediately when structure appears to be in danger and notify Engineer.
- E. Disconnect and remove designated utilities within demolition areas.
- F. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.
- G. Demolish in orderly and careful manner. Protect existing improvements, supporting structural members.

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

- H. Carefully remove building components indicated to be reused.
 - 1. Disassemble components as required to permit removal.
 - 2. Package small and loose parts to avoid loss.
 - 3. Mark components and packaged parts to permit reinstallation.
 - 4. Store components, protected from construction operations, until reinstalled.
- I. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.
- J. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.
- K. Remove temporary Work.

3.04 SCHEDULES

- A. Materials and equipment scheduled for demolition are shown in detail on the “_D” sheets, and in select notes on the Contract Drawings.
- B. Demolition shall be staged so that the Water Treatment Plant can remain in service throughout the duration of construction.

END OF SECTION

DIVISION 3
CONCRETE

SECTION 030100 - MAINTENANCE OF CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Concrete repair.
2. Cementitious repair materials and mixing.
3. Reinforcement materials.

B. Related Requirements:

1. Section 033000 - Cast-in-Place Concrete: Cast-in-place or in-situ concrete for structural building frames, slabs on grade, and other concrete components.

1.02 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
3. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
4. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
5. ASTM C150/C150M - Standard Specification for Portland Cement.
6. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
7. ASTM C293/C293M - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading).
8. ASTM C882/C882M - Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.
9. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.

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

D. Manufacturer Instructions: Submit mixing instructions.

SECTION 030100 - MAINTENANCE OF CONCRETE

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

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of repairs and type of repair.

1.05 QUALITY ASSURANCE

- A. Perform welding Work according to AWS D1.4.
- B. Perform Work according to New York State Department of Transportation standards.
- C. Design reinforcement splices under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of New York.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
- B. Applicator: Company specializing in performing Work of this Section with minimum three years' experience and approved by manufacturer.
- C. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of New York.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

SECTION 030100 - MAINTENANCE OF CONCRETE

1.08 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 CEMENTITIOUS REPAIR MATERIAL

A. Manufacturers:

1. BASF Corporation-Construction.
2. CGM, Inc.
3. ChemMasters, Inc.
4. Dayton Superior.
5. Euclid Chemical Company.
6. Fox Industries, Inc.
7. Kaufman Products, Inc.
8. Sika Corporation.
9. Sto Corp.
10. Unitex by Dayton Superior.
11. US SPEC.
12. W.R. Meadows, Inc.
13. US Concrete Products.
14. Substitutions: Permitted.

B. Portland Cement: ASTM C150, Type II, gray color.

C. Normal Weight Aggregates: ASTM C33.

1. Coarse Aggregate Size: In accordance with ACI 318.
2. Sand: uniformly graded, clean.

D. Water: Clean and potable.

E. Air Entrainment Admixture: ASTM C260.

F. Calcium Chloride: Not permitted.

G. Bonding Agent: Polyvinyl acetate emulsion.

H. Cleaning Agent: Commercial muriatic acid.

2.02 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.

SECTION 030100 - MAINTENANCE OF CONCRETE

- B. Stirrup Steel: ASTM A82/A82M.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for application examination.
- B. Verify that surfaces are ready to receive Work.
- C. Beginning of installation means acceptance of existing surfaces and substrate.

3.02 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for application preparation.
- B. Shoring:
 - 1. Install shoring as required prior to performing any demolition at structural concrete members, including walls, elevated slabs, and beams.
 - 2. Shoring is required whenever load carrying capacity of any structural element is reduced by repairs or has been already reduced by deterioration.
 - 3. Elevated decks, beams or other elevated structures shall be shored during repairs. Shoring shall be in place, inspected, and accepted by the design engineer or the inspection agency prior to concrete removal.
 - 4. Shoring shall not be removed until repaired structure is capable of carrying design load for element without shoring.
- C. Partial Depth Concrete Repairs:
 - 1. Partial depth repair areas to be laid out by contractor by sounding with hammers, chain dragging, or other appropriate means. The area to be removed shall be marked with paint. The limits of said areas will be verified jointly between Contractor and Engineer.
 - 2. Remove deteriorated concrete by jackhammering to a minimum depth of 4". If depth of repair exceeds 2/3 the thickness of the slab a full depth repair shall be made.
 - 3. Removal shall start in middle of marked area and proceed outward towards edges until sound concrete is encountered.
 - 4. Final detailing to remove delaminated concrete and profile edges shall be done with 15 lb. chipping hammers or with hand tools, taking care not to create damage in sound concrete at edges and sides of patch areas. Demolition debris and foreign materials shall be carefully removed from patch areas before surface preparation operations.
 - 5. Exposing and undercutting reinforcing steel shall be accomplished by initial demolition of concrete, removal of loose, delaminated concrete above oxidized and corroded reinforcing steel. Oxidized and corroded bars shall be undercut a minimum of 3/4 inch or 1/4 inch larger than largest sized aggregate in patching concrete, whichever is greater. Exposed bars not oxidized or corroded do not have to be undercut if less than 50% of

SECTION 030100 - MAINTENANCE OF CONCRETE

bar's circumference is exposed and bond between bar and concrete is intact. If bond is broken or more than 50% of bar's circumference is exposed, the bar shall be undercut as described above. Removal of concrete around reinforcing bars shall extend to point where bar is well bonded to concrete and free of corrosion. Care shall be taken during undercutting not to damage bond between concrete and reinforcing bar in areas beyond patch.

6. In cases where apparently corroded or heavily oxidized reinforcing bars extend beyond marked repair areas into apparently sound concrete, Engineer or his designated representative, shall direct Contractor how far to extend limits of repair area.
7. Saw cut around the perimeter of the repair area to a depth of ½" being careful to not cut any reinforcement. Rectangular patch areas are preferred. Repair areas shall be cut with square edges and 90 degree corners.
8. Complete concrete removal to edges of patch area, taking care not to damage concrete beyond repair area by chipping around edges. Take care not to break bond of reinforcing steel with concrete outside of patch area. If Contractor must extend size of patch areas because careless chipping damages sound concrete, additional area shall be patched at Contractor's expense.
9. Clean surface of exposed reinforcement to remove concrete and other deleterious materials by sandblasting or other means.
10. Saturate the surface of the prepared concrete surfaces a minimum of two hours prior to concrete placement. Remove standing water to a surface saturated dry condition prior to placing concrete.

D. Full Depth Concrete Repairs:

1. Full depth repair areas to be laid out by contractor by sounding with hammers, rodding, or other appropriate means. The area to be removed shall be marked with paint. The limits of said areas will be verified jointly between Contractor and Engineer.
2. Remove deteriorated concrete by jackhammering the full depth of the slab.
3. Removal shall start in middle of marked area and proceed outward towards edges until sound concrete is encountered.
4. Final detailing to remove delaminated concrete and profile edges shall be done with 15 lb. chipping hammers or with hand tools, taking care not to create damage in sound concrete at edges and sides of patch areas. Demolition debris and foreign materials shall be carefully removed from patch areas before surface preparation operations.
5. Exposing reinforcing steel shall be accomplished by initial demolition of concrete, removal of loose, delaminated concrete around oxidized and corroded reinforcing steel. Oxidized and corroded bars shall have concrete removed to provide a minimum of 3/4 inch or 1/4 inch larger than largest sized aggregate in patching concrete, whichever is greater. Exposed bars not oxidized or corroded do not have to be fully exposed if less than 50% of bar's circumference is exposed and bond between bar and concrete is intact. If bond is broken or more than 50% of bar's circumference is exposed, the bar shall be fully exposed as described above. Removal of concrete around reinforcing bars shall extend to point where bar is well bonded to concrete and free of corrosion. Care shall be taken during undercutting not to damage bond between concrete and reinforcing bar in areas beyond patch.
6. In cases where apparently corroded or heavily oxidized reinforcing bars extend beyond marked repair areas into apparently sound concrete, Engineer or his designated representative, shall direct Contractor how far to extend limits of repair area.

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7. Saw cut around the perimeter of the repair area to a depth of ½" being careful to not cut any reinforcement. Rectangular patch areas are preferred. Repair areas shall be cut with square edges and 90 degree corners.
8. Complete concrete removal to edges of patch area, taking care not to damage concrete beyond repair area by chipping around edges. Take care not to break bond of reinforcing steel with concrete outside of patch area. If Contractor must extend size of patch areas because careless chipping damages sound concrete, additional area shall be patched at Contractor's expense.
9. Clean surface of exposed reinforcement to remove concrete and other deleterious materials by sandblasting or other means.
10. Install formwork and supports as require for the repair areas. Design, construct, maintain, remove formwork for concrete according to ACI 347 "Recommended Practice for Concrete Formwork", ACI 301, "Specifications for Structural Concrete for Buildings", as modified and applicable rules and regulations of agencies having jurisdiction. Contractor shall be totally responsible for formwork design, construction, as required, to safely support both new and existing concrete during construction, in addition to maintaining safe working conditions at all times.
11. Conform to line, level, grade, shape, size and position shown as required by original configuration of existing concrete and shore or truss forms adequately to produce concrete which is true to dimensions and elevations shown as required by original configuration of existing concrete within allowable tolerances. Set exposed concrete perimeters to accurate elevation, level and alignment with an instrument.
12. Clean forms well for general Work and wet immediately before placing concrete. Formwork shall be free of papers, sawdust, dirt and debris when concrete is placed.
13. Saturate the surface of the prepared concrete surfaces a minimum of two hours prior to concrete placement. Remove standing water to a surface saturated dry condition prior to placing concrete.

E. Reinforcement Repairs:

1. If an isolated single reinforcing bar has lost more than 25% of its cross sectional area to corrosion or if two or more consecutive bars have lost more than 20% of their cross sectional areas, cut concrete back to uncorroded metal. Splice in a new bar of equal size with sufficient lap, in accordance with ACI 318 or if lap splicing is not possible, weld on a new bar, in accordance with ACI 318 and AWS to develop 125% of capacity of bar. New bars spliced in or added shall be coated as specified herein.

3.03 APPLICATION

A. Selection of Placement Methods:

1. Contractor may choose placement method best suited to a particular situation consistent with the following guidelines. Placement methods shall be reviewed with Engineer at pre-construction meeting. Engineer reserves right to reject placement methods where method proposed is not appropriate for situation. If polymer-modified material is used, manufacturer's representative and Engineer shall be present during the first placement of material.
2. Where possible, formed cast in place is the preferred placement method and shall be used for all horizontal deck or beam repairs. Additionally, it is preferred for columns, walls and slab edges.

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3. Trowel applied is acceptable only for surface repairs where polymer-modified repair materials are used specifically formulated for trowel applications
 4. Dry mix shotcrete can be used for large vertical and overhead areas without congested reinforcing steel. Wet mix shotcrete can be used in large vertical areas without congested reinforcing steel.
 5. Form and pumping is preferred for overhead repairs. Formwork must be tight, able to withstand pumping pressure and braced so as to not sag under pressure.
 6. Preplaced aggregate is acceptable only for special situations where other methods are undesirable
- B. Placement:
1. Apply a scrub coat of a thin cement slurry with a stiff brush just prior to placement of repair material. Mortar and/or concrete must be scrubbed into substrate filling pores and voids. Use a stiff nylon brush to scrub into surface.
 2. Place concrete while scrub coat is still plastic, force material against edge of repair, working toward center. Use mechanical vibrators or other appropriate means to completely consolidate concrete in formwork and fill voids. Strike off surfaces to desired level. After filling, consolidate, then screed.
- C. Finishing:
1. Allow repair material to set to desired stiffness. Finish with broom or burlap drag to match original surface.
- D. Curing:
1. After finishing cure by covering exposed surfaces with wet burlap. Keep burlap wet with water misting as required. Evaporation can also be retarded by covering wet burlap with plastic sheets. Wet curing shall continue for a minimum of 72 hours. If ambient conditions cause premature drying of concrete, continue wet curing for an additional 48 hours or use non-solvent, water based curing compound, which has been pre-approved by Engineer and Manufacturer of repair materials.
- E. Sealing Patch Perimeters:
1. Either tool in wet concrete or rout, in cured concrete, a joint to a minimum depth of 3/8 inch and minimum width of 3/8 inch using diamond blade saw or routing bit. Do not exceed 1/2 inch X 1/2 inch routed dimension. Clean dust, debris, and foreign materials out of routed crack. Crack shall be clean and dry before placing sealant. Insert backer rod or bond breaking tape into base of joint. Fill joint with flexible sealant. Tool surface if necessary to leave surface of sealant slightly below or flush with concrete surface.
- F. Cleaning:
1. Thoroughly clean work area to remove all dust, dirt, overspray on columns, walls, and soffits.

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G. Repair of Deficient Work:

1. Excessive honeycombing or large voids may be cause for rejection of Work. Voids accepted by Engineer as not being detrimental to structure must be filled to produce an acceptable surface.
2. Grind off concrete fins or humps created by seams in formwork or at edges of repair areas. Grinding may be used to profile or level surfaces which are unacceptable after casting. The preferred method of creating grooves, drip edges and chamfers is by forming; however, grinding can be used to create these details where inadvertently omitted from formwork.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Test concrete for calcium chloride content during execution of the Work.

3.05 SCHEDULE

- A. The Contractor shall include the following quantities in the Lump Sum Bid. Quantities beyond these will be paid for under the Miscellaneous Contingency Allowance.

Item	Quantity	Detail
Concrete Partial Depth Repair	50 s.f.	B4/S-503
Concrete Full Depth Repair	50 s.f.	B5/S-503
Concrete Vertical & Overhead Repair	50 s.f.	C4/S-503
Concrete Overhead Beam Repair	100 s.f.	C5/S-503

END OF SECTION

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Formwork for cast-in-place concrete.
2. Shoring, bracing, and anchorage.
3. Architectural form liners.
4. Form accessories.
5. Form stripping.

B. Related Requirements:

1. Section 032000 - Concrete Reinforcing: Reinforcing steel and required supports for cast-in-place concrete.
2. Section 033000 - Cast-in-Place Concrete: Cast-in-place or in-situ concrete for structural building frame, slabs-on-grade, and other concrete components associated with building.

1.02 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI 347 - Guide to Formwork for Concrete.

B. American Forest & Paper Association:

1. AF&PA - National Design Specification (NDS) for Wood Construction.

C. APA - The Engineered Wood Association:

1. APA/EWA PS 1 - Voluntary Product Standard - Structural Plywood.

D. West Coast Lumber Inspection Bureau:

1. WCLIB - Standard No. 17 Grading Rules for West Coast Lumber.

1.03 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with other Sections of Work in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings:
 - 1. Indicate:
 - a. Formwork, shoring, and reshoring.
 - b. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
 - c. Means of leakage prevention for concrete exposed to view in finished construction.
 - d. Sequence and timing of erection and stripping, assumed compressive strength at time of stripping, height of lift, and height of drop during placement.
 - e. Vertical, horizontal, and special loads according to ACI 347, and camber diagrams when applicable.
 - f. Notes to formwork erector showing size and location of conduits and piping embedded in concrete according to ACI 318.
 - g. Procedure and schedule for removal of shores and installation and removal of reshores.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Delegated Design Submittals:
 - 1. Submit signed and sealed Shop Drawings with design calculations and assumptions for formwork and shoring.
 - 2. Indicate loads transferred to structure during process of concreting, shoring, and reshoring.
 - 3. Include structural calculations to support design.

1.05 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. For wood products furnished for Work of this Section, comply with AF&PA.
- C. Design formwork under direct supervision of Professional Engineer experienced in design of the Work and licensed in the State of New York.

1.06 QUALIFICATIONS

- A. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of New York.

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PART 2 - PRODUCTS

2.01 WOOD FORM MATERIALS

- A. Form Materials: At discretion of Contractor and approved by Engineer.

2.02 PREFABRICATED FORMS

A. Manufacturers:

- 1. EFCO.
- 2. Molded Fiber Glass Construction.
- 3. Sonoco Products Co.
- 4. Symons by Dayton Superior.
- 5. Wall-Ties & Forms, Inc.
- 6. Western Forms.
- 7. Substitutions: Permitted.

- B. Preformed Steel Forms: Minimum 16 gage matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

- C. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.

- D. Pan Type: Steel of size and profile required.

- E. Steel Forms: Sheet steel, suitably reinforced, and designed for particular use indicated on Drawings.

- F. Form Liners: Smooth, durable, grainless and non-staining hardboard, unless otherwise indicated on Drawings.

- G. Framing, Studding and Bracing: Stud or No. 3 structural light framing grade.

2.03 FORMWORK ACCESSORIES

- A. Form Ties: Suitable for concrete tank wall construction, with waterproofing washer.

1. Manufacturers:

- a. Heckmann Building Products.
- b. Symons by Dayton Superior.
- c. Wall-Ties & Forms, Inc.
- d. Substitutions: Permitted.

- B. Spreaders: Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. Wire ties, wood spreaders or through-bolts not permitted.

C. Form Anchors and Hangers:

- 1. Do not use anchors and hangers leaving exposed metal at concrete surface.
- 2. Symmetrically arrange hangers supporting forms from structural steel members.

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3. Penetration of structural steel members is not permitted.
- D. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture.
1. Manufacturers:
 - a. Architectural Concrete Chemicals, LLC.
 - b. Nox-Crete Products Group.
 - c. Substitutions: Permitted.
- E. Corners: Chamfer, wood strip type; 1 x 1 inch size; maximum possible lengths.
1. Manufacturers:
 - a. BoMetals, Inc.
 - b. Wall-Ties & Forms, Inc.
 - c. Substitutions: Permitted.
- F. Dovetail Anchor Slot: Galvanized steel, 22 gage thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
1. Manufacturers:
 - a. BoMetals, Inc.
 - b. Dur-O-Wal.
 - c. Heckmann Building Products.
 - d. Substitutions: Permitted.
- G. Flashing Reglets: Rigid PVC, 22 gage thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
1. Manufacturers:
 - a. Cheney Flashing Company.
 - b. Fry Reglet Corporation.
 - c. Heckmann Building Products.
 - d. Hohmann & Barnard, Inc.
 - e. O'Keeffe's Inc.
 - f. W.P. Hickman Systems, Inc.
 - g. Substitutions: Permitted.
- H. Vapor Retarder: Where indicated on Drawings, 8 mil thick polyethylene sheet.
- I. Bituminous Joint Filler: ASTM D1751.
- J. Nails, Spikes, Lag Bolts, Through-bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.

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- K. Water Stops: PVC, minimum 1,750 psi tensile strength, maximum minus 35 degrees Flow temperature brittleness according to ASTM D-746, 9 inch wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

1. Manufacturers:

- a. Adeka Ultra Seal/OCM, Inc.
- b. BoMetals, Inc.
- c. JP Specialties, Inc.
- d. Paul Murphy Plastics Co.
- e. Sika Greenstreak.
- f. Vinylex Waterstop & Accessories.
- g. WESTEC Barrier Technologies.
- h. Williams Products, Inc.
- i. Substitutions: Permitted.

2.04 COATINGS

- A. Coatings for Aluminum: Polyamide epoxy finish coat with paint manufacturer's recommended primer for aluminum substrate. Apply one coat primer and one coat finish.

1. Manufacturers:

- a. H&C Concrete Care Products.
- b. Increte Systems, Inc.
- c. Sauereisen.
- d. Substitutions: Permitted.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify lines, levels, and centers before proceeding with formwork.
- C. Verify that dimensions agree with Drawings.
- D. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Engineer before proceeding.

3.02 INSTALLATION

- A. Earth Forms: Not permitted.

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B. Formwork:

1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
3. Camber forms where necessary to produce level finished soffits unless indicated otherwise on Drawings.
4. Positioning:
 - a. Carefully verify horizontal and vertical positions of forms.
 - b. Correct misaligned or misplaced forms before placing concrete.
5. Complete wedging and bracing before placing concrete.
6. Erect formwork, shoring, and bracing to achieve design requirements according to ACI 318.
7. Stripping:
 - a. Arrange and assemble formwork to permit dismantling and stripping.
 - b. Do not damage concrete during stripping.
 - c. Permit removal of remaining principal shores.
8. Obtain approval of Engineer before framing openings in structural members not indicated on Drawings.
9. Do not reuse wood formwork more than two times for concrete surfaces to be exposed to view.
10. Do not patch formwork.
11. Leave forms in place for minimum number of days according to ACI 347.

C. Form Removal:

1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads, and removal has been approved by Architect/Engineer.
2. Loosen forms carefully; do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
3. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged.
4. Discard damaged forms.
5. Form Release Agent:
 - a. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
 - b. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.
 - c. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer's

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specifications. Do not coat forms for concrete indicated to receive "scored finish."
Apply form coatings before placing reinforcing steel.

6. Form Cleaning:
 - a. Clean forms as erection proceeds to remove foreign matter within forms.
 - b. Clean formed cavities of debris prior to placing concrete.
 - c. Flush with water or use compressed air to remove remaining foreign matter.
 - d. Ensure that water and debris drain to exterior through cleanout ports.
 - e. Cold Weather:
 - 1) During cold weather, remove ice and snow from within forms.
 - 2) Do not use de-icing salts.
 - 3) Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure; use compressed air or other dry method to remove foreign matter.
7. Reuse and Coating of Forms:
 - a. Thoroughly clean forms and reapply form coating before each reuse.
 - b. For exposed Work, do not reuse forms with damaged faces or edges.
 - c. Apply form coating to forms according to manufacturer instructions.
 - d. Do not coat forms for concrete indicated to receive "scored finish."
 - e. Apply form coatings before placing reinforcing steel.
- D. Framing, Studding, and Bracing:
 1. Maximum Spacing of Studs:
 - a. Boards: Maximum 16 inches o.c.
 - b. Plywood: 12 inches o.c.
 2. Size framing, bracing, centering, and supporting members for sufficient strength to maintain shape and position under imposed loads from construction operations.
 3. Distribute bracing loads over base area on which bracing is erected.
 - a. When placed on ground, protect against undermining, settlement, and accidental impact.
- E. Form Anchors and Hangers:
 1. Do not use anchors and hangers leaving exposed metal at concrete surface.
 2. Symmetrically arrange hangers supporting forms from structural-steel members to minimize twisting or rotation of member.
 3. Penetration of structural-steel members is not permitted.
- F. Inserts, Embedded Parts, and Openings:
 1. Install formed openings for items to be embedded in or passing through concrete Work.
 2. Locate and set in place items required to be cast directly into concrete.
 3. Install accessories straight, level, and plumb, and ensure that items are not disturbed during concrete placement.

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4. Joints:
 - a. Install waterstops continuous without displacing reinforcement.
 5. Openings:
 - a. Provide temporary ports or openings in formwork as required to facilitate cleaning and inspection.
 - b. Locate openings at bottom of forms to allow flushing water to drain.
 6. Close temporary openings with tight-fitting panels, flush with inside face of forms, and neatly fitted such that joints will not be apparent in exposed concrete surfaces.
- G. Form Ties:
1. Provide sufficient strength and quantity to prevent spreading of forms.
 2. Place ties at least 1 inch away from finished surface of concrete.
 3. Leave inner rods in concrete when forms are stripped.
 4. Space form ties equidistant, symmetrical, and aligned vertically and horizontally unless indicated otherwise on Drawings.
- H. Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.
- I. Construction Joints:
1. Install surfaced pouring strip where construction joints intersect on exposed surfaces to provide straight line at joints.
 2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
 3. Appearance:
 - a. Show no overlapping of construction joints.
 - b. Construct joints to present same appearance as butted plywood joints.
 4. Arrange joints in continuous line straight, true, and sharp.
- J. Embedded Items:
1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, waterstops, and other features.
 2. Do not embed wood or uncoated aluminum in concrete.
 3. Obtain installation and setting information for embedded items furnished under other Sections.
 4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
 5. Ensure that conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 regarding size and location limitations.

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K. Openings for Items Passing through Concrete:

1. Frame openings in concrete where indicated on Drawings.
2. Establish exact locations, sizes, and other conditions required for openings and attachment of Work specified under other Sections.
3. Coordinate Work to avoid cutting and patching of concrete after placement.
4. Perform cutting and repairing of concrete required as result of failure to provide required openings.

L. Screeds:

1. Set screeds and establish levels for tops of and finish on concrete slabs.
2. Slope slabs to drain where required or as indicated on Drawings.
3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms; remove freestanding water.

M. Screed Supports:

1. For concrete over waterproof membranes and vapor retarder membranes, use cradle-, pad-, or base-type screed supports that will not puncture membrane.
2. Staking through membrane is not permitted.

N. Cleanouts and Access Panels:

1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris, and waste material.
2. Clean forms and surfaces against which concrete is to be placed.
3. Remove chips, sawdust, and other debris.
4. Thoroughly blow out forms with compressed air just before concrete is placed.

3.03 TOLERANCES

A. Construct formwork to maintain tolerances according to ACI 318 and ACI 350.

B. Camber:

1. Slabs and Beams: 1/4 inch per 10 feet.

3.04 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

C. Inspection:

1. Inspect erected formwork, shoring, and bracing to ensure that Work complies with formwork design and that supports, fastenings, wedges, ties, and items are secure.
2. Notify Architect/Engineer after placement of reinforcing steel in forms but prior to placing concrete.
3. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

SECTION 031500 - CONCRETE ANCHORING

PART 1 - GENERAL

1.01 SUMMARY

A. SECTION INCLUDES

1. General purpose mechanical anchors for horizontal and vertical applications.
2. Adhesive anchors.
3. Suspended ceiling hanger anchors.
4. Anchors for light duty horizontal applications where holding power is not critical.
5. Deck inserts for threaded rods or bolts.

B. RELATED SECTIONS

1. Section 033000 - Cast-in-Place Concrete: Concrete that anchors are to be installed in, and other types of cast in place inserts.
2. Section 042000 - Unit Masonry: Masonry that anchors are to be installed in.
3. Section 051200 - Structural Steel Framing: Steel members that anchors are to be installed in.
4. Section 053123 - Steel Roof Decking: Deck that deck inserts are to be installed in.
5. Section 055000 - Metal Fabrications: Miscellaneous steel members that anchors are to be installed in.
6. Section 260529 - Hangers and Supports for Electrical Systems: Electrical hangers and supports to be hung using anchors specified in this section.

1.02 REFERENCES

A. American Society for Testing and Materials:

1. ASTM A 194/A 194M - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both; 2001a.
2. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2000.
3. ASTM A 563 - Standard Specification for Carbon and Alloy Steel Nuts; 2000.
4. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2001b.
5. ASTM B 633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 1998.
6. ASTM B 695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2000.
7. ASTM C 881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 1999.
8. ASTM F 436 - Standard Specification for Hardened Steel Washers; 1993 (Reapproved 2000).
9. ASTM F 593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2002.

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10. SAE J429 - Mechanical and Material Requirements for Externally Threaded Fasteners; Society of Automotive Engineers; 1999.

1.03 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Sizes, locations, and spacing.
 2. Installation methods.
- C. Engineering Design Data: For each structural application, provide data substantiating specified design requirements, signed by design engineer.

1.04 PROJECT CONDITIONS

- A. A variety of coatings and platings are offered to resist various extremes of corrosion. The corrosive environment in which the anchor or fastener is installed should be considered for each specific application.
- B. For adhesive anchors, maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install under environmental conditions outside manufacturer's absolute limits.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturer:
 1. Powers Fasteners.
 2. HiHi.
- B. Substitutions: Permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 013310.

2.02 MATERIALS

- A. Concrete Anchors - General: Select type and size to achieve required loading capacity using information provided by manufacturer.
 1. If required type is not indicated, select type appropriate to conditions and item being fastened.

SECTION 031500 - CONCRETE ANCHORING

2. If required loading capacity is not indicated on the drawings, determine required loading capacity in accordance with accepted engineering principles and as required by applicable code.
 3. For structural applications, provide engineering design by professional engineer licensed in the State in which the project is located.
 4. Use recommended and appropriate safety factors and load reduction factors.
 5. For non-structural applications, space anchors as required to support the material being anchored without sagging or deformation.
 6. Confirm application requirements for cracked and uncracked concrete substrates.
- B. Anchors for Horizontal Light Duty Applications Where Holding Power is Not Critical: Use one of the following:
1. Acceptable Product: Bantam Plug or Fluted Plastic Anchor; injection molded plastic expansion sleeve for sheet metal and wood screws.
 2. Acceptable Product: Scru-Lead; tubular lead alloy with flange, for sheet metal and wood screws.
 3. Acceptable Product: Hammer Drive Pins; 1/4 inch (6 mm) diameter knob head pin with 0.14 inch (3.5 mm) shank and 3/8 inch (9.5 mm) diameter washer as tool guide; heat treated carbon steel, plated in accordance with ASTM B 633, SC1, Type III.
 4. Acceptable Product: Calk-In; tool-set expansion type, pre-assembled antimonial lead alloy calking sleeve and Zamac alloy internally-threaded expander cone, into which machine bolt or screw is inserted and tightened.
 5. Acceptable Product: Lag Shield; Zamac alloy screw style anchor for lag bolts.
 6. Acceptable Product: Single; expansion type pre-assembled machine bolt anchor with Zamac alloy expansion shield and internally threaded expander cone.
 7. Acceptable Product: Double; dual expansion type pre-assembled machine bolt anchor with twin tubular sleeves bound together with high tension spring steel bands that contain two protruding wedge shaped cones; Zamac alloy.
 8. Acceptable Product: Nylon Nailin; driven type, pre-assembled nail drive anchor with nylon body.
 - a. Mushroom head carbon steel nail plated in accordance with ASTM B 633, SC1, Type III.
 - b. Flat head carbon steel nail plated in accordance with ASTM B 633, SC1, Type III.
 - c. Round head carbon steel nail plated in accordance with ASTM B 633, SC1, Type III.
 - d. Mushroom head Type 304 stainless steel nail.
 9. Acceptable Product: Zamac Nailin; driven type, pre-assembled nail drive anchor with Zamac alloy body.
 - a. Mushroom head; carbon steel nail plated in accordance with ASTM B 633, SC1, Type III.
 - b. Flat head; carbon steel nail plated in accordance with ASTM B 633, SC1, Type III.
 - c. Mushroom head; Type 304 stainless steel nail.

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- C. Deck Inserts: For installation through deck or forms prior to placement of concrete; different diameters color coded for threaded rods or bolts in sizes from 1/4 inch (6 mm) to 3/4 inch (19 mm) diameter; six-sided impact plate providing resistance to rotation; heat treated carbon steel insert plated in accordance with ASTM B 633.
1. For Steel Deck: Bang-It; for installation in pre-drilled holes, with protective sleeve protruding below deck to prevent applied materials from clogging threads or hiding location.
 2. For Wood Forms: Wood-Knocker, color coded flange on surface of concrete after stripping. Prior to pouring concrete over the wood form, place the Wood-Knocker Concrete Insert (break-off nails down) on the surface of the wood form at the desired location. Strike the impact plate of the insert with a hand held hammer, until the plastic color-coded flange is flush with the wood surface.
- D. Suspended Ceiling Hanger Anchors: Tie-wire head; use one of the following:
1. Acceptable Product: The Power-Stud, one piece, wedge type expansion anchor.
 - a. Zinc plated carbon steel anchor body with stainless steel wedges.
 2. Acceptable Product: Drive; driven type, pre-expanded one-piece unit, heat treated carbon steel, plated in accordance with ASTM B 633, SC1, Type III.
 3. Acceptable Product: SPIKE; driven type, pre-expanded one-piece unit that develops compression forces at three different levels in bottom of anchor hole; carbon steel, Grade 8.2, plated in accordance with ASTM B 633, SC1, Type III.
 4. Acceptable Product: Lok-Bolt; torqued expansion type; pre-assembled sleeve style, with triple tined expansion sleeve; carbon steel plated in accordance with ASTM B 633, SC1, Type III.
 5. Acceptable Product: Power-Stud+ SD2; fully threaded, torque-controlled, wedge expansion anchor. Manufactured with a zinc plated carbon steel body and stainless steel expansion clip for premium performance; head marked with length code; for installation by driving into same diameter hole and expanding by turning nut.
 6. Acceptable Product: Power-Stud+ SD1; fully threaded, torque-controlled, wedge expansion anchor. Manufactured with a zinc plated carbon steel body and carbon steel expansion clip for reliable performance; head marked with length code; for installation by driving into same diameter hole and expanding by turning nut.
- E. Vertical Rod Anchors: Rod hanger head internally threaded to accept steel threaded rod or threaded bolt; use one of the following:
1. Acceptable Product: The Power-Stud, one piece, wedge type expansion anchor.
 - a. Mechanically galvanized carbon steel anchor body with stainless steel wedges.
 - b. Stainless steel Type 304.
 - c. Stainless steel Type 316.
 2. Acceptable Product: Rod Hanger Lok-Bolt; torqued expansion type; pre-assembled sleeve style, with triple tined expansion sleeve; carbon steel plated in accordance with ASTM B 633, SC1, Type III.
 3. Acceptable Product: Snake+ anchor, internally threaded, self-tapping screw anchor. The screw anchor is installed into a drilled hole with a power tool and a setting tool. Zinc

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plated carbon steel with unified coarse internal threads. Zinc plating according to ASTM B633, SC1, Type III (Fe/Zn 5) – interior low level corrosion environment. Anchor Size: 3/8 inch (9.5 mm) diameter with shallow embedment.

4. Acceptable Product: Vertigo; hardened carbon steel plated in accordance with ASTM B 633, SC1, Type III.
 - a. For Wood: Thread forming wood screw; either vertical or side mounting of rod/bolt.
 - b. For Steel: Self-drilling, self-tapping screw; either vertical or side mounting of rod/bolt.
 - c. For Concrete: Double lead threaded bolt with integral washer, to be installed in hole pre-drilled using matched tolerance bit; vertical mounting of rod/bolt.

- F. Epoxy Injection Adhesive Anchoring System: Type recommended by manufacturer for application and use, rated for loadings and anchored items required.
 1. Acceptable Product: AC100+ Gold; two component, all weather, high performance, epoxy acrylate. Anchor Size Range: 3/8 inch to 1-1/4 inches (9.5mm to 32 mm) and 1/2 inch to 3/4 inch (13 mm to 19 mm) internally threaded inserts. Complies with descriptive requirements of ASTM C 881, Type IV, Grade 3, Classes A, B, and C, except for gel time; mixed and dispensed through motionless, static mixing nozzle and dispensing tool; shelf life of 15 months. NSF 61 approved.
 2. Acceptable Product: PE1000+; two-component, high strength adhesive anchoring system. Anchor Size range: 3/8 inch to 1-1/4 inches (9.5 mm to 32 mm). Conforms to requirements of ASTM C881, Types I, II, III, IV and V, Grade 3, Classes B & C.

- G. Anchors and Inserts for Drilled Anchor Holes with Injection Adhesive:
 1. Threaded Rod: ASTM A 307, carbon steel plated in accordance with ASTM B 633, SC1, with Type III clear chromate treated.
 2. Threaded Rod: ASTM A 193 Grade B7, ASTM A 194 Grade 2H or ASTM A 563 Grade DH nuts, and ASTM F 436 washers; plated in accordance with ASTM B 633, SC1, with Type II yellow chromate treatment.
 3. Threaded Rod: Type 304 stainless steel, passivated.
 4. Threaded Rod: Type 316 stainless steel, passivated.
 5. Reinforcing Bars: ASTM A 615/A 615M, Grade 60.

- H. General Purpose Anchors: Use one of the following:
 1. Acceptable Product: Wedge-Bolt+; one piece carbon steel screw anchor with finished hex head with integral washer, double lead thread, chamfered tip, ratchet teeth on underside of head to be installed in hole pre-drilled using Wedge bit; head stamped with diameter and length. Approved for cracked and uncracked concrete. Plated in accordance with ASTM B 633, SC1, Type III.

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2. Acceptable Product: Wedge-Bolt; one piece screw anchor with finished hex head with integral washer, double lead thread, chamfered tip, ratchet teeth on underside of head to be installed in hole pre-drilled using matched tolerance bit; head stamped with diameter and length.
 - a. Carbon Steel Wedge-Bolt+ installed with Wedge-Bit. Plated in accordance with ASTM B 633, SC1, Type III.
 - b. Carbon Steel Wedge-Bolt OT installed with ANSI Drill Bit. Plated in accordance with ASTM B 633, SC1, Type III.
 - c. Type 410 Stainless Steel Wedge-Bolt installed with Wedge-Bit.
3. Acceptable Product: Power-Bolt; torque-controlled, self-undercutting type; pre-assembled heavy duty sleeve style, with internal bolt, nylon compression ring, expansion cone with oversized annular ring that expands to undercut the base material.
 - a. Hex head, Grade 5 carbon steel, plated in accordance with ASTM B 633, SC1, Type III.
 - b. Flat head, Grade 5 carbon steel, plated in accordance with ASTM B 633, SC1, Type III.
 - c. Type 303 or 304 stainless steel, ASTM F 593 hex head.
4. Acceptable Product: Power-Stud; torque-controlled, wedge type; one piece body with expansion mechanism consisting of two interlocking independent wedges; head marked with length code; for installation by driving into same diameter hole and expanding by turning nut.
 - a. Carbon steel anchor body and wedges, plated in accordance with ASTM B 633, SC1, Type III.
 - b. Mechanically galvanized carbon steel anchor body with stainless steel wedges.
 - c. Type 304 stainless steel anchor body and wedges.
 - d. Type 316 stainless steel anchor body and wedges.
5. Acceptable Product: Power-Stud+ SD2; fully threaded, torque-controlled, wedge expansion anchor. Manufactured with a zinc plated carbon steel body and stainless steel expansion clip for premium performance; head marked with length code; for installation by driving into same diameter hole and expanding by turning nut.
6. Acceptable Product: Power-Stud+ SD1; fully threaded, torque-controlled, wedge expansion anchor. Manufactured with a zinc plated carbon steel body and carbon steel expansion clip for reliable performance; head marked with length code; for installation by driving into same diameter hole and expanding by turning nut.
7. Acceptable Product: Lok-Bolt; torque-controlled; expansion type; preassembled sleeve style, with nylon compression ring and triple tined expansion sleeve.
 - a. Carbon steel plated in accordance with ASTM B 633, SC1, Type III.
 - b. Stainless steel.
 - c. Head: Hex nut.
 - d. Head: Acorn nut.
 - e. Head: Round head.
 - f. Head: Flat head.

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8. Acceptable Product: Set-Bolt; driven deformation type, one piece stud style anchor with bottom-bearing external expansion plug; carbon steel plated in accordance with ASTM B 633, SC1, Type III; attached fixture secured with nut and washer on exposed screw threads.
9. Acceptable Product: SPIKE; driven deformation type, pre-expanded one-piece unit that develops compression forces at three different levels in bottom of anchor hole.
 - a. Carbon Steel, Mushroom Head.
 - b. Carbon Steel, Flat Head.
 - c. Type 316 Stainless Steel, Mushroom Head.
 - d. Carbon Steel Pipe Spike.
 - e. Carbon Steel Tie Wire.
10. Acceptable Product: Drive; driven deformation type, pre-expanded one-piece unit, heat treated carbon steel, plated in accordance with ASTM B 633, SC1, Type III.
 - a. Head: Round (tamperproof).
 - b. Head: Flat (tamperproof).
11. Acceptable Product: Zamac HAMMER-SCREW; driven deformation type, pre-assembled nail drive anchor with mushroom style head and Zamac alloy body; Phillips screw head for removal.
 - a. Carbon steel screw plated in accordance with ASTM B 633, SC1, Type III.
 - b. Type 304 stainless steel screw.
12. Acceptable Product: Zamac NAILIN; driven deformation type, pre-assembled nail drive anchor with Zamac alloy body.
 - a. Zinc alloy, mushroom head, carbon steel drive pin.
 - b. Zinc alloy, flat head, carbon steel drive pin.
 - c. Zinc alloy, mushroom head, stainless steel drive pin.
13. Acceptable Product: TAPPER; one-piece screw anchor.
 - a. Carbon steel with white Perma-Seal fluoropolymer coating.
 - b. Carbon steel with blue Perma-Seal fluoropolymer coating.
 - c. Carbon steel with silver Perma-Seal fluoropolymer coating.
 - d. Carbon steel with bronze Perma-Seal fluoropolymer coating.
 - e. Type 304 stainless steel.
 - f. Type 410 stainless steel.
 - g. Carbon steel. Zinc plated
 - h. Head: Hex washer.
 - i. Head: Flat Phillips.
14. Acceptable Product: Hollow-Set Dropin; tool-set expansion type, pre-assembled tapered slotted expansion sleeve of Zamac alloy with threaded steel expansion cone, into which machine bolt is inserted and tightened.
 - a. Expansion Cone: Plated in accordance with ASTM B 633, SC1, Type III.
 - b. Expansion Cone: Type 304 stainless steel.

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15. Acceptable Product: Steel Dropin; tool-set expansion type, pre-assembled shell style with internal expansion plug, into which machine bolt is inserted and tightened.
 - a. Carbon steel, smooth wall
 - b. Carbon steel, flange (lipped).
 - c. Carbon steel, coil thread.
 - d. Type 303 stainless steel, smooth wall.
 - e. Type 316 stainless steel, smooth wall.

 16. Acceptable Product: Mini Dropin; tool-set expansion type, pre-assembled shell style with internal expansion plug, into which machine bolt is inserted and tightened; embedment of 3/4 inch (19 mm) maximum; carbon steel plated in accordance with ASTM B 633, SC1, Type III. Sizes as required for application.
 - a. Size: 1/4 inch (6 mm).
 - b. Size: 3/8 inch (9.5 mm).
 - c. Size: 1/2 inch (12 mm).
 - d. As required.

 17. Acceptable Product: Snake+; internally threaded self tapping screw anchor. Application in normal weight concrete, structural sand lightweight concrete and concrete over metal deck. Suitable for cracked and uncracked concrete. Case hardened zinc plated carbon steel body. Predrilled hole and setting tool required.
 - a. 3/8 inch (9.5 mm) diameter and length as required for application and strength required.
- I. Cracked Concrete Anchors: Use one of the following:
1. Acceptable Product: Power-Stud+ SD2; fully threaded, torque-controlled, wedge expansion anchor. Manufactured with a zinc plated carbon steel body and stainless steel expansion clip for premium performance; head marked with length code; for installation by driving into same diameter hole and expanding by turning nut.
 2. Acceptable Product: Power-Stud+ SD1; fully threaded, torque-controlled, wedge expansion anchor. Manufactured with a zinc plated carbon steel body and carbon steel expansion clip for reliable performance; head marked with length code; for installation by driving into same diameter hole and expanding by turning nut.
 3. Acceptable Product: Wedge-Bolt+; one piece carbon steel screw anchor with finished hex head with integral washer, double lead thread, chamfered tip, ratchet teeth on underside of head to be installed in hole pre-drilled using Wedge bit; head stamped with diameter and length. Approved for cracked and uncracked concrete. Plated in accordance with ASTM B 633, SC1, Type III.
 4. Acceptable Product: Snake+; internally threaded self tapping screw anchor. Application in normal weight concrete, structural sand lightweight concrete and concrete over metal deck. Suitable for cracked and uncracked concrete. Case hardened zinc plated carbon steel body. Predrilled hole and setting tool required.
 - a. 3/8 inch (9.5 mm) diameter and length as required for application and strength required.

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5. Acceptable Product: PE1000+; two-component, high strength adhesive anchoring system. Anchor Size range: 3/8 inch to 1-1/4 inches (9.5 mm to 32 mm). Conforms to requirements of ASTM C881, Types I, II, III, IV and V, Grade 3, Classes B & C.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations and as required by applicable code.
- B. Apply anchor items neatly, with anchor mounted plumb and level unless otherwise indicated.

3.04 FIELD QUALITY CONTROL

- A. The Engineer reserves the right to require the anchor manufacturer's representative to demonstrate proper installation procedures for post-installed anchors and to observe Contractor's installation procedures, at no extra cost to Owner.
- B. The Engineer reserves the right to require pullout or shear tests to determine adequacy of anchors, at no extra cost to Owner.
- C. Testing: 25% of each type and size of drilled-in anchor shall be proof loaded by the independent testing laboratory. Adhesive anchors and capsule anchors shall not be torque tested unless otherwise directed by the Engineer. If more than 10% of the tested anchors fail to achieve the specified torque of proof load within the limits as defined on the drawings, all anchors of the same diameter and type as the failed anchor shall be tested, unless otherwise instructed by the Engineer.
 1. Tension testing should be performed in accordance with ASTM E488.
 2. Torque shall be applied with a calibrated torque wrench.

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3. Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed $D/10$, where D is the nominal anchor diameter.

END OF SECTION

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Reinforcing bars.
 - 2. Welded wire fabric.
 - 3. Reinforcement accessories.

1.02 SUBMITTALS

- A. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and welded wire fabric, bending and cutting schedules, and supporting and spacing devices.
- B. Certificates: AWS qualification for welders employed on Work.
- C. Manufacturer's Certificate: Products meet or exceed specified requirements.
- D. Certified copies of mill test report of reinforcement materials analysis.

1.03 QUALITY ASSURANCE

- A. Perform Work according to ACI 318.
- B. Prepare Shop Drawings according to ACI SP-66.
- C. Welders: AWS-qualified within previous 12 months.

PART 2 - PRODUCTS

2.01 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.
- B. Welded Deformed Wire Fabric: ASTM A497/A497M; in flat sheets; unfinished.

2.02 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type.

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- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.
- C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather-exposed Concrete Surfaces: Plastic-coated steel type; size and shape to meet Project conditions.
- D. Reinforcing Splicing Devices: Mechanical threaded type; full tension and compression; sized to fit joined reinforcing.
 - 1. Manufacturers:
 - a. Dur-O-Wal.
 - b. ERICO International Corp.
 - c. Symons by Dayton Superior
 - d. Substitutions: Permitted.

2.03 FABRICATION

- A. Fabricate concrete reinforcement according to ACI 318 and ACI 350.
- B. Form standard hooks for 180 degree bends, 90 degree bend, stirrup and tie hooks, and seismic hooks as indicated on Drawings.
- C. Form reinforcement bends with minimum diameters according to ACI 318.
- D. Form ties and stirrups from following:
 - 1. Bars No. 10 and Smaller: No. 3 deformed bars and No. 4 deformed bars or as indicated on the Drawings.
- E. Locate reinforcement splices at point of minimum stress. Review location of splices with Engineer.

2.04 SOURCE QUALITY CONTROL

- A. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 - 1. Specified shop tests are not required for Work performed by approved fabricator.

SECTION 032000 - CONCRETE REINFORCING

PART 3 - EXECUTION

3.01 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance.
 - 1. Do not weld crossing reinforcement bars for assembly.
- B. Space reinforcement bars with minimum clear spacing in accordance with ACI 318.
 - 1. Where bars are indicated in multiple layers, place upper bars directly above lower bars.
- C. Maintain concrete cover around reinforcement in accordance with as follows:

Reinforcement Location		Minimum Concrete Cover
Footings and Concrete Formed Against Earth		3 inches
Concrete exposed to earth or weather	No. 6 bars and larger	2 inches
	No. 5 bars and smaller	2 inches
Supported Slabs, Walls, and Joists	No. 14 bars and larger	2 inches
	No. 11 bars and smaller	2 inches
Beams and Columns		2 inches

- D. Splice reinforcing where indicated on Drawings according to splicing device manufacturer's instructions.
- E. Bond and ground reinforcement in accordance with requirements of Section 260526.

3.02 ERECTION TOLERANCES

- A. Install reinforcement within following tolerances for flexural members, walls, and compression members:

Reinforcement Depth	Depth Tolerance	Concrete Cover Tolerance
Greater than 8 inches	plus or minus 3/8 inch	minus 3/8 inch
Less than 8 inches	plus or minus 1/2 inch	minus 1/2 inch

- B. Install reinforcement within tolerances specified in 350 for tank walls.

SECTION 032000 - CONCRETE REINFORCING

3.03 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed by Contractor's testing laboratory according to New York State Building Code.
- B. Provide free access to Work and cooperate with subcontracted firm.
- C. Reinforcement Inspection:
 - 1. Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances.
 - 2. Welding: Inspect welds in accordance with AWS D1.1.
 - 3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
 - 4. Weldability Inspection: Inspect for reinforcement weldability when formed from steel other than ASTM A706/A706M.
 - 5. Continuous Weld Inspection: Inspect reinforcement as required by ACI 318.
 - 6. Periodic Weld Inspection: Other welded connections.
- D. Place, support and secure reinforcement against displacement.
- E. Do not weld crossing reinforcement bars for assembly.
- F. Space reinforcement bars with minimum clear spacing according to ACI 318.
- G. Maintain concrete cover around reinforcement according to ACI 318 and ACI 350.
- H. Bond and ground reinforcement according to requirements of Section 260526.

END OF SECTION

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes cast-in-place concrete for the following:
 - 1. Foundation walls.
 - 2. Slabs on grade.
 - 3. Control, expansion and contraction joint devices.
 - 4. Equipment pads.

- B. Related Sections:
 - 1. Section 031000 - Concrete Forming and Accessories
 - 2. Section 032000 - Concrete Reinforcing.
 - 3. Section 033900 - Concrete Curing.
 - 4. Section 079000 - Joint Protection.

1.02 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 305 - Hot Weather Concreting.
 - 3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
 - 4. ACI 308.1 - Standard Specification for Curing Concrete.
 - 5. ACI 318 - Building Code Requirements for Structural Concrete.
 - 6. ACI 350 - Code Requirements for Environmental Engineering Concrete Structures.

- B. ASTM International:
 - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 3. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 4. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 5. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
 - 6. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
 - 7. ASTM C150 - Standard Specification for Portland Cement.
 - 8. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.

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9. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
13. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
14. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
15. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
16. ASTM C685/C685M - Standard Specification for Concrete Made By Volumetric Batching and Continuous Mixing.
17. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
18. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
19. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
20. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
21. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
22. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
23. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
24. ASTM C1218/C1218M - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
25. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
26. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
27. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
28. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
29. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
30. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
31. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
32. ASTM E1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
33. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

SECTION 033000 - CAST-IN-PLACE CONCRETE

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on joint devices, attachment accessories, admixtures and.
- C. Design Data:
 - 1. Submit concrete mix design for each concrete strength. Submit separate mix designs when admixtures are required for the following:
 - a. Hot and cold weather concrete work.
 - b. Air entrained concrete work.
 - 2. Identify mix ingredients and proportions, including admixtures.
 - 3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.
- D. Samples: Submit two 9 x 12 inch long samples of expansion/contraction joint and control joint.
- E. Manufacturer's Installation Instructions: Submit installation procedures and interface required with adjacent Work.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 318 and ACI 350.
- B. Conform to ACI 305 when concreting during hot weather.
- C. Conform to ACI 306.1 when concreting during cold weather.
- D. Acquire cement and aggregate from one source for Work.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
- B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days.

SECTION 033000 - CAST-IN-PLACE CONCRETE

1.07 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type II Δ Moderate, or Type IIA - Air Entraining Portland type.
- B. Normal Weight Aggregates: ASTM C33.
 - 1. Coarse Aggregate Maximum Size: In accordance with ACI 318.
- C. Water: ACI 318; potable, without deleterious amounts of chloride ions.

2.02 ADMIXTURES

- A. Manufacturers:
 - 1. BASF Construction Chemical.
 - 2. Euclid Chemical Co.
 - 3. Grace Construction Products.
 - 4. Sika Corporation.
 - 5. Substitutions: Permitted.
- B. Air Entrainment: ASTM C260.
- C. Chemical: ASTM C494/C494M.
- D. Plasticizing: ASTM C1017/C1017M.

2.03 ACCESSORIES

- A. Bonding Agent:
 - 1. Manufacturers:
 - a. Euclid Chemical Company.
 - b. Sika Corporation.
 - c. W.R. Meadows, Inc.
 - d. Substitutions: Section 016000 - Product Requirements.

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- B. Non-Shrink Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

1. Manufacturers:

- a. Euclid Chemical Co.
- b. L&M Construction Chemical.
- c. QUIKRETE.
- d. Sika Corporation.
- e. Substitutions: Section 016000 - Product Requirements.

2.04 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler Type C: ASTM D1752; Premolded sponge rubber.
- B. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with Shore A hardness of 35 to permit plus or minus 25 percent joint movement with full recovery; of longest manufactured length at each location, recessed mounted; color as selected.
- C. Sealant and Primer: As specified in Section 079200.

2.05 VAPOR BARRIER

- A. Vapor barrier shall be six (6) mil polyethylene sheets applied in the widest practicable width with all seams lapped a minimum of six (6) inches, and secured in place.

2.06 CONCRETE MIX

- A. Select proportions for concrete in accordance with ACI 318 trial mixtures.
- B. Provide concrete to the following criteria:

Material and Property	Measurement
Compressive Strength (28 day)	4,000 psi
Cement Type	ASTM C150
Cement Content (minimum)	606 pounds/cu yd
Aggregate Type	Normal weight
Fine Aggregate	36 percent by volume
Water-Cement Ratio (maximum)	0.46 by weight
Air Content	6.5 percent plus or minus 1.5 percent

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Fly Ash Content:	20 percent of cementitious materials by weight, maximum
Silica Fume Content:	0 percent of cementitious materials by weight, maximum
Slag	0 percent of cementitious materials by weight, maximum
Slump	3 inches plus or minus 1 inch

- C. Admixtures: Include admixture types and quantities indicated in concrete mix designs only when approved by Engineer.
1. Use accelerating admixtures in cold weather. Use of admixtures will not relax cold weather placement requirements.
 2. Do not use calcium chloride nor admixtures containing calcium chloride.
 3. Use set retarding admixtures during hot weather.
 4. Add air entrainment admixture to concrete mix for work exposed to freezing and thawing or deicing chemicals.
 5. For concrete exposed to deicing chemicals, limit fly ash, pozzolans, silica fume, and slag content as required by applicable code.
- D. Average Compressive Strength Reduction: Permitted in accordance with ACI 318.
- E. Ready Mixed Concrete: Mix and deliver concrete in accordance with ASTM C94/C94M.
- F. Site Mixed Concrete: Mix concrete in accordance with ACI 318.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify requirements for concrete cover over reinforcement.
- C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.02 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.
- B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- C. Remove debris and ice from formwork, reinforcement, and concrete substrates.

SECTION 033000 - CAST-IN-PLACE CONCRETE

- D. Remove water from areas receiving concrete before concrete is placed.

3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 318 and ACI 350.
- B. Notify testing laboratory and Engineer minimum 24 hours prior to commencement of operations.
- C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints, are not disturbed during concrete placement.
- D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by taping edges and ends.
- E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with 1/2 inch thick joint filler.
- G. Install construction joint devices in coordination with pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Install joint device anchors. Maintain correct position to allow joint cover to be flush with floor and wall finish.
- I. Install joint covers in longest practical length, when adjacent construction activity is complete.
- J. Apply sealants in joint devices in accordance with Section 079000.
- K. Deposit concrete at final position. Prevent segregation of mix.
- L. Place concrete in continuous operation for each panel or section determined by predetermined joints.
- M. Consolidate concrete.
- N. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- O. Place concrete continuously between predetermined expansion, control, and construction joints.

3.04 CONCRETE FINISHING

- A. Provide formed concrete surfaces to be left exposed with smooth rubbed finish.
- B. Finish concrete floor surfaces in accordance with ACI 318.

SECTION 033000 - CAST-IN-PLACE CONCRETE

- C. Steel trowel surfaces which are indicated to be exposed.
- D. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/4 inch per foot nominal.

3.05 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
 - 1. Protect concrete footings from freezing for minimum seven days.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Cure concrete floor surfaces as specified in Section 033900.

3.06 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Field inspection and testing will be performed by Contractor's testing laboratory in accordance with New York State Building Code.
- C. Provide free access to Work and cooperate with subcontracted firm.
- D. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of Work.
- E. Concrete Inspections:
 - 1. Continuous Placement Inspection: Inspect for proper installation procedures.
 - 2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.
- F. Strength Test Samples:
 - 1. Sampling Procedures: ASTM C172.
 - 2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
 - 3. Sample concrete and make one set of five cylinders for every 75 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.
 - 4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.
 - 5. Make one additional cylinder during cold weather concreting, and field cure.

SECTION 033000 - CAST-IN-PLACE CONCRETE

G. Field Testing:

1. Slump Test Method: ASTM C143/C143M.
2. Air Content Test Method: ASTM C173/C173M.
3. Temperature Test Method: ASTM C1064/C1064M.
4. Measure slump and temperature for each compressive strength concrete sample.
5. Measure air content in air entrained concrete for each compressive strength concrete sample.

H. Cylinder Compressive Strength Testing:

1. Test Method: ASTM C39/C39M.
2. Test Acceptance: In accordance with ACI 318.
3. Test one cylinder at 7 days.
4. Test two cylinders at 28 days.
5. Test one cylinder at 14 days.
6. Retain one cylinder for 56 days for testing when requested by Engineer.
7. Dispose remaining cylinders when testing is not required.

I. Core Compressive Strength Testing:

1. Sampling and Testing Procedures: ASTM C42/C42M.
2. Test Acceptance: In accordance with ACI 318.
3. Drill three cores for each failed strength test from concrete represented by failed strength test.

J. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.07 PATCHING

- A. Allow Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Honeycomb or embedded debris in concrete is not acceptable. Notify Engineer upon discovery.
- C. Patch imperfections as directed by Engineer.

3.08 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Engineer for each individual area.

END OF SECTION

SECTION 033000 - CAST-IN-PLACE CONCRETE

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SECTION 033500 - CONCRETE FINISHING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Finishing concrete floors.
 - 2. Floor surface treatment.
- B. Related Sections:
 - 1. Section 033000 - Cast-In-Place Concrete.
 - 2. Section 033900 - Concrete Curing.
 - 3. Section 079000 - Joint Protection.

1.02 REFERENCES

- A. American Concrete Institute:
 - 1. ACI 301 - Specifications for Structural Concrete.
 - 2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
- B. ASTM International:
 - 1. ASTM E1155 - Standard Test Method for Determining Floor Flatness and of Levelness Using the F-number System.

1.03 SUBMITTALS

- A. Product Data: Submit data on sealer, curing compounds and slip resistant treatment, compatibilities, and limitations.

1.04 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit data on maintenance renewal of applied coatings.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 and ACI 302.1.
- B. Perform Work in accordance with Building Codes New York State (B.C.N.Y.S.).

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

SECTION 033500 - CONCRETE FINISHING

- B. Installer: Company specializing in performing work of this section with minimum three years documented experience.

1.07 MOCK-UP

- A. Construct mock-up area under conditions similar to those which will exist during actual placing, 10 feet long by 10 feet wide, with specified finishes, and coatings applied.
- B. Locate where directed by Engineer.
- C. Incorporate accepted mockup as part of Work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's packaging including application instructions.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Temporary Lighting: Minimum 200 W light source, placed 8 feet above floor surface, for each 425 sq ft of floor being finished.
- B. Do not finish floors until interior heating system is operational.
- C. Temporary Heat: Ambient temperature of 50 degrees F minimum.
- D. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

1.10 COORDINATION

- A. Coordinate the Work with concrete floor placement and concrete floor curing.

PART 2 - PRODUCTS

2.01 COMPOUNDS - HARDENERS AND SEALERS

- A. Sealer:
 - 1. Manufacturers:
 - a. ChemTec Int'l.
 - b. Euclid Chemical Company.
 - c. Vexcon Chemical Inc.

SECTION 033500 - CONCRETE FINISHING

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify floor surfaces are acceptable to receive the Work of this section.

3.02 FLOOR FINISHING

- A. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1.
- B. Steel trowel surfaces which are indicated to be exposed.
- C. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains as indicated on Drawings.

3.03 FLOOR SURFACE TREATMENT

- A. Apply sealer on floor surfaces.

3.04 TOLERANCES

- A. Maximum Variation of Surface Flatness For Exposed Concrete Floors: 1/8 inch in 10 ft.
- B. Correct defects in defined traffic floor by grinding or removal and replacement of defective Work. Areas requiring corrective Work will be identified. Re-measure corrected areas by same process.

END OF SECTION

SECTION 033500 - CONCRETE FINISHING

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SECTION 033900 - CONCRETE CURING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes initial and final curing of horizontal and vertical concrete surfaces.

1.02 SUBMITTALS

- A. Product Data: Curing compounds, Mats, compatibilities, and limitations.

1.03 QUALITY ASSURANCE

- A. Perform Work according to ACI 318 and ACI 350.
- B. Perform Work according to New York State Department of Transportation Standards.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Membrane Curing Compound: ASTM C309, Type 1D, Class B.

- 1. Manufacturers:

- a. Anti-Hydro International.
- b. BASF Corporation-Construction.
- c. ChemMasters, Inc.
- d. Dayton Superior Specialty.
- e. Euclid Chemical Company.
- f. Kaufman Products, Inc.
- g. L&M Construction Chemical.
- h. Lambert Corporation.
- i. Nox-Crete Products Group.
- j. Right Pointe.
- k. SpecChem, LLC.
- l. TK Products.
- m. US Spec.
- n. Vexcon Chemicals Inc.
- o. W.R. Meadows, Inc.
- p. Substitutions: Permitted.

SECTION 033900 - CONCRETE CURING

PART 3 - EXECUTION

3.01 INSTALLATION - HORIZONTAL SURFACES

- A. Cure concrete according to ACI 308.1.
- B. Spraying: Spray water over floor slab areas and maintain wet for seven days.
- C. Membrane Curing Compound: Apply curing compound in one coat.

3.02 INSTALLATION - VERTICAL SURFACES

- A. Cure concrete according to ACI 308.1.
- B. Membrane Curing Compound: Apply compound in two coats with second coat applied at right angles to first.

END OF SECTION

SECTION 036000 - GROUTING

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 SUBMITTALS

- A. Product Data: Grout.
- B. Manufacturer's Installation Instructions: Mixing, handling, surface preparation and placing epoxy type and non-shrink type grouts.
- C. Manufacturer's Certificate: Products meet or exceed specified requirements.

1.03 QUALITY ASSURANCE

- A. Perform Work according to New York State Department of Transportation Standards.

1.04 ENVIRONMENTAL REQUIREMENTS

- A. Do not perform grouting if temperatures exceed 85 degrees F.
- B. Maintain minimum temperature of 50 before, during, and after grouting, until grout has set.

PART 2 - PRODUCTS

2.01 PORTLAND CEMENT GROUT MATERIALS

- A. Portland Cement: ASTM C150, Type II.
- B. Water:
 - 1. Potable; containing no impurities, suspended particles, algae or dissolved natural salts in quantities capable of causing:
 - a. Corrosion of steel.
 - b. Volume change increasing shrinkage cracking.
 - c. Efflorescence.

SECTION 036000 - GROUTING

- d. Excess air entraining.
- C. Fine Aggregate:
 - 1. Washed natural sand.
 - 2. Gradation in accordance with ASTM C33 and represented by smooth granulometric curve within required limits.
 - 3. Free from injurious amounts of organic impurities as determined by ASTM C40.
- D. Mix:
 - 1. Portland cement, sand and water. Do not use ferrous aggregate or staining ingredients in grout mixes.

2.02 RAPID CURING EPOXY GROUT

- A. Manufacturers:
 - 1. L&M Construction Chemical.
 - 2. Sika Corporation.
 - 3. W.R. Meadows, Inc.
 - 4. Substitutions: Permitted.
- B. Rapid-Curing Epoxy Grout: High strength, three-component epoxy grout formulated with thermosetting resins and inert fillers. Rapid-curing, high adhesion, and resistant to ordinary chemicals, acids and alkalis.

Property	Test	Result
Compressive Strength	ASTM C579	12,000 psi at 7 days
Tensile Strength	ASTM C307	2,000 psi minimum
Coefficient of Expansion	ASTM C531	0.000030 in per degree F
Shrinkage	ASTM C827	none

2.03 NON-SHRINK CEMENTITIOUS GROUT

- A. Manufacturers:
 - 1. CGM, Inc.
 - 2. Euclid Chemical Company.
 - 3. L&M Construction Chemical.
 - 4. QUIKRETE.
 - 5. Sika Corporation
 - 6. Substitutions: Permitted.
- B. Non-shrink Cementitious Grout: Pre-mixed ready for use formulation requiring only addition of water; non-corrosive, non-metallic, non-gas-forming, no chlorides.
- C. Properties: Certified to maintain initial placement volume or expand after set and meet following minimum properties when tested according to CRD-C621, for Type D non-shrink grout:

SECTION 036000 - GROUTING

Property	Test	Time	Result
Setting Time	ASTM C191	Initial	2 hours (approx.)
		Final	3 hours (approx.)
Expansion			0.10% - 0.4% Maximum
Compressive Strength	CRD-C621	1 day	4,000 psi
		7 days	7,000 psi
		28 days	10,000 psi to 10,800 psi

2.04 FORMWORK

- A. Refer to Section 031000.

2.05 CURING

- A. Prevent rapid loss of water from grout during first 48 hours by using approved membrane curing compound or with by using wet burlap method.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Remove defective concrete, laitance, dirt, oil, grease and other foreign material from concrete surfaces until sound, clean concrete surface achieved.
- B. Rough concrete lightly, but not enough to interfere with placement of grout.
- C. Remove foreign materials from metal surfaces in contact with grout.
- D. Align, level, and maintain final positioning of components to be grouted.
- E. Saturate concrete surfaces with clean water; remove excess water, leaving none standing.

3.02 INSTALLATION - FORMWORK

- A. Construct leakproof forms anchored and shored to withstand grout pressures.
- B. Install formwork with clearances to permit proper placement of grout.

3.03 MIXING

- A. Portland Cement Grout:
 1. Use proportions of two parts sand to one part cement, measured by volume.
 2. Prepare grout with water to obtain consistency to permit placing and packing.

SECTION 036000 - GROUTING

3. Mixing Water and Grout: Pre-mix using approximately 2/3 of water; after partial mixing, add remaining water to bring mix to desired placement consistency and continue mixing 2 to 3 minutes.
 4. Mix only quantities of grout capable of being placed within 30 minutes after mixing.
 5. Do not add additional water after grout has been mixed.
- B. Mix and prepare rapid curing epoxy grout according to manufacturer's instructions.
 - C. Mix and prepare non-shrink cementitious grout according to manufacturer's instructions.
 - D. Mix grout components in proximity to Work area and transport mixture quickly and in manner not permitting segregation of materials.

3.04 PLACING GROUT

- A. Do not use pneumatic-pressure or dry-packing methods; do not vibrate placed grout.
- B. Thoroughly compact final installation and eliminate air pockets.

3.05 CURING

- A. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. After grout has attained its initial set, keep damp for minimum of three days.

3.06 FIELD QUALITY CONTROL

- A. Perform field inspection and testing according to ACI 318.
- B. Submit proposed mix design of each class of grout to inspection and testing firm for review prior to commencement of Work.
- C. Tests of grout components may be performed to ensure conformance with specified requirements.

END OF SECTION

DIVISION 4

MASONRY

SECTION 040100 - MAINTENANCE OF MASONRY

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Replacement of brick masonry units.
 - 2. Repointing of mortar joints.
- B. Related Requirements:
 - 1. Section 040513 – Masonry Mortaring.
 - 2. Section 040516 - Masonry Grouting.

1.02 REFERENCE STANDARDS

- A. American Concrete Institute:
 - 1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.

1.03 PREINSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing Work of this Section.
- B. Qualifications Statements:
 - 1. Submit manufacturer's approval of applicator.

1.04 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1.

1.05 QUALIFICATIONS

- A. Applicator: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.06 MOCKUPS

- A. Using specified materials and procedures, provide up to 3 different samples of masonry repointing of mortar colors to match the existing. Owner will select the mortar from the installed cured samples.

SECTION 040100 - MAINTENANCE OF MASONRY

- B. Acceptable panel illustrating results of repointing will become standard for Work of this Section.

1.07 AMBIENT CONDITIONS

- A. Cold Weather Requirements: Comply with ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F.
- B. Hot Weather Requirements: Comply with ACI 530/530.1 if ambient temperature is greater than 100 degrees F, or if ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Mortar Materials: As specified in Section 040514 - Masonry Mortaring and Grouting
- B. Brick Masonry Units: As specified in Section 042000 – Unit Masonry

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces to be repointed are ready for Work of this Section.

3.02 PREPARATION

- A. Protect elements surrounding Work of this Section from damage or disfiguration.
- B. Immediately remove stains, efflorescence, or other excess resulting from Work of this Section.
- C. Close off, seal, and board up areas, materials, and surfaces adjacent to Work of this Section to protect from damage.
- D. Construct dustproof and weatherproof partitions to close off interior areas during Work.

3.03 INSTALLATION

- A. Comply with procedures used in approved mockup.
- B. Replacing brick masonry:
 - 1. Replace cracked, spalled, or otherwise deficient brick units.

SECTION 040100 - MAINTENANCE OF MASONRY

2. Repair areas to be laid out by Contractor by sounding with hammers, rodding, or other appropriate means. The area to be removed shall be marked with paint. The limits of said areas will be verified jointly between Contractor and Engineer. The Contractor shall include the replacement of 100 brick in the Lump Sum Bid. Quantity beyond this will be paid for under the Miscellaneous Contingency Allowance.
3. Support masonry above units to be removed as required in advance of cutting out units to maintain stability of remaining materials.
4. The mortar that surrounds the affected units should be cut out carefully to avoid damaging adjacent units. For ease of removal, the units to be removed can be broken.
5. Once the units are removed, all of the surrounding mortar should be carefully chiseled out, and all dust and debris should be swept out with a brush.
6. The brick surfaces in the wall should be dampened before new units are placed, but the masonry should absorb all surface moisture to ensure a good bond.
7. Mortar Mix: Prehydrated mortar colored and proportioned to match existing work as specified in Section 040513 - Masonry Mortaring and Section 040516 - Masonry Grouting.
8. Water should be added to the prehydrated mortar to bring it to a workable consistency.
9. The appropriate surfaces of the surrounding units and the replacement units should be buttered with mortar.
10. Install built-in masonry Work to match and align with existing work, with joints and coursing true and level and faces plumb and in line.
11. Build in openings, accessories, and fittings.
12. The replacement units should be centered in the opening and pressed into position.
13. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
14. Coursing of brick:
 - a. Bond: Match existing.
 - b. Coursing: Match existing.
 - c. Mortar Joints: Concave.
15. The excess mortar should be removed with a trowel.
16. When the mortar becomes "thumbprint" hard, the joints should be tooled to match the original profile.
17. Ensure that new bedding and pointing mortar mix do not have compressive strength exceeding existing mortar or masonry materials.
18. Excess pressure when packing repointing mortar can cause problems, as resulting mortar strength can exceed compressive strength of masonry units and cause spalling during later weather cycling. Similarly, tuck-pointing mortar should not be denser than original mortar.

C. TOLERANCES

1. Maximum Variation from Unit to Adjacent Unit: 1/16 inch
2. Maximum Variation from Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10; 1/2 inch in 30 feet.
3. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

SECTION 040100 - MAINTENANCE OF MASONRY

D. REPOINTING OF DEFICIENT MORTAR JOINTS:

1. Repointing will be performed on all exterior brick mortar joints.
2. Care shall be taken to avoid damage of existing brick edges. If power tools, such as a grinder or toothing chisel, are to be used the width of removal shall be smaller than the existing mortar joints leaving mortar on the existing units. The remaining mortar shall be removed by hand chisel unless it can be demonstrated removal by power tool can be performed without damaging the existing units.
3. The deteriorated mortar should be removed, to a uniform depth, that is twice the joint width or until sound mortar is reached, minimum depth of removal shall be 1 inch.
4. Remove all dust and debris from the joint by brushing, blowing with air or rinsing with water.
5. The joints to be repointed should be dampened, but to ensure a good bond, the brickwork must absorb all surface water before repointing mortar is placed.
6. Water should be added to the prehydrated mortar to bring it to a workable consistency (somewhat drier than conventional mortar).
7. The mortar should be packed tightly into the joints in 1/4 in. maximum layers.
8. The joints should be tooled to match the original profile after the last layer of mortar is "thumbprint" hard.
9. Moist cure for 72 hours.

E. Cleaning of New Masonry:

1. Confirm with masonry supplier or manufacturer that intended cleaning methods will not harm masonry units or bond with mortar.
2. Verify that mortar is fully set and cured.
3. Clean surfaces and remove large particles with wood scrapers or brass or nylon wire brushes.
4. Scrub walls with a detergent solution using stiff brush.
5. Thoroughly rinse and wash off cleaning solution, dirt, and mortar crumbs using clean, pressurized water.

3.04 CLEANING

- A. As Work proceeds and upon completion of Work, remove excess mortar, smears, and droppings.
- B. Clean surrounding surfaces.

3.05 PROTECTION

- A. Protect exposed external corners subject to damage.
- B. Protect base of walls from mud and mortar splatter.

SECTION 040100 - MAINTENANCE OF MASONRY

- C. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- D. Protect tops of masonry Work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when Work is not in progress. Maintain protection on tops of completed exterior walls until installation of permanent waterproof cap materials.

END OF SECTION

SECTION 040100 - MAINTENANCE OF MASONRY

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SECTION 040513 - MASONRY MORTARING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Mortar for new masonry construction.
2. Mortar for masonry joint repointing and unit masonry replacement.

B. Related Requirements:

1. Section 040100 - Maintenance of Masonry.
2. Section 042000 - Unit Masonry.

1.02 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.

B. ASTM International:

1. ASTM C91 - Standard Specification for Masonry Cement.
2. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
3. ASTM C150 - Standard Specification for Portland Cement.
4. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars.
5. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
6. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
7. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
8. ASTM C1329 - Standard Specification for Mortar Cement.
9. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength.

1.03 SUBMITTALS

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

B. Design Data: Submit required environmental conditions, admixture limitations, and design mix if property specification of ASTM C270 is to be used.

C. Test and Evaluation Reports:

1. Indicate compliance of mortar to property requirements of ASTM C270.

SECTION 040513 - MASONRY MORTARING

- D. Manufacturer Instructions: Submit premixed mortar installation instructions.

1.04 QUALITY ASSURANCE

- A. Comply with ACI 530/530.1.

1.05 QUALIFICATIONS

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

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store materials according to manufacturer instructions.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement:
 - 1. Comply with ASTM C150, Type I.
 - 2. Color: To match existing.
- B. Blended Cement:
 - 1. Comply with ASTM C595.
 - 2. Color: To match existing.
- C. Masonry Cement:
 - 1. Comply with ASTM C91, Type N.
 - 2. Color: To match existing.
- D. Mortar Cement:
 - 1. Comply with ASTM C1329 Type N.
 - 2. Color: To match existing.

SECTION 040513 - MASONRY MORTARING

- E. Premix Mortar:
 - 1. Comply with ASTM C387, Type N.
 - 2. Cement Color: To match existing.
- F. Mortar Aggregate:
 - 1. Comply with ASTM C144.
 - 2. Type: Standard masonry.
- G. Hydrated Lime: Comply with ASTM C206, Type N.
- H. Quicklime:
 - 1. Comply with ASTM C5.
 - 2. Type: Non-hydraulic.
- I. Water: Clean and potable.
- J. Mortar Color:
 - 1. Description: Mineral oxide pigment.
 - 2. Color: to match existing.
- K. Calcium Chloride: Not allowed.

2.02 MIXES

- A. Mortar Mixes:
 - 1. Mortar for Structural Masonry: Comply with ASTM C270, Type S using proportion specification.
 - 2. Mortar for Non-Structural Masonry: Comply with ASTM C270, Type N using proportion specification.
 - 3. Mortar for Repointing and Unit Replacement: Comply with ASTM C270, Type N using proportion specification.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Mortar Mixing:
- B. Mortar Mixing:
- C. Mortar for New Masonry:
 - 1. Thoroughly mix mortar ingredients according to ASTM C270 in quantities needed for immediate use.

SECTION 040513 - MASONRY MORTARING

2. Achieve uniformly damp sand immediately before mixing process.
3. Retemper only within two hours of mixing.

D. Mortar for Masonry Repairs

1. The repointing and unit replacement mortar should be prehydrated to reduce excessive shrinkage. The proper prehydration process is as follows:
 - a. Achieve uniformly damp sand immediately before mixing process.
 - b. Add mortar color to achieve uniform mix and coloration.
 - c. All dry ingredients should be thoroughly mixed according to ASTM C270 in quantities needed for immediate use.
 - d. Only enough clean water should be added to the dry mix to produce a damp consistency which will retain its shape when formed into a ball.
 - e. The mortar should be mixed to this dampened condition 1 to 1-1/2 hr before adding water for placement.
 - f. Mortar strength and color can be affected if sand is not kept damp before mixing.
2. Retemper only within two hours of mixing.

3.02 INSTALLATION

- A. According to ACI 530/530.1.

3.03 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- B. Establish mortar mix according to ASTM C270.

END OF SECTION 040513

SECTION 040516 - MASONRY GROUTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Grout for masonry.
- B. Related Requirements:
 - 1. Section 040100 - Maintenance of Masonry: Bedding and pointing mortar for masonry restoration Work.
 - 2. Section 042000 - Unit Masonry: Installation of grout.

1.02 REFERENCE STANDARDS

- A. American Concrete Institute:
 - 1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
- B. ASTM International:
 - 1. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
 - 2. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete.
 - 3. ASTM C150 - Standard Specification for Portland Cement.
 - 4. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
 - 5. ASTM C476 - Standard Specification for Grout for Masonry.
 - 6. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
 - 7. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - 8. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
 - 9. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
 - 10. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Test and Evaluation Reports: Submit compliance with grout property requirements according to ASTM C476 and test and evaluation reports according to ASTM C1019.
- D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

SECTION 040516 - MASONRY GROUTING

1.04 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1.
- B. Perform Work according to New York State Building Code standards.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.06 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Cold Weather Requirements: According to ACI 530/530.1 if ambient temperature or temperature of masonry units is less than 40 degrees F.
- C. Hot Weather Requirements: According to ACI 530/530.1 if ambient temperature is greater than 100 degrees F or if ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement: Comply with ASTM C150, Type I.
- B. Grout Aggregate: Comply with ASTM C404 fine and coarse.
- C. Fly Ash: Comply with ASTM C618.
- D. Water: Clean and potable.

SECTION 040516 - MASONRY GROUTING

- E. Calcium Chloride: Not allowed.

2.02 MIXES

A. Grout:

1. Grout for Non-Structural Masonry:

- a. Compressive Strength: 2,000 psi at 28 days.
- b. Slump: 8 to 11 inches.
- c. Mixing: According to ASTM C476.

2. Grout for Structural Masonry:

- a. Compressive Strength: 2,000 psi at 28 days.
- b. Slump: 8 to 11 inches.
- c. Mixing: According to ASTM C476.

3. Application:

- a. Coarse Grout: Grouting spaces with minimum 4-inch dimension in each direction.
- b. Fine Grout: Grouting other spaces.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Request inspection of spaces to be grouted.

3.02 INSTALLATION

A. Mixing:

- 1. Mix grout according to ASTM C94, as modified to use ingredients complying with ASTM C476.

- B. Comply with ACI 530/530.1.

3.03 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

SECTION 040516 - MASONRY GROUTING

B. Testing:

1. Mix: Comply with ASTM C1019 for compressive strength, and comply with ASTM C143 for slump.
2. Compressive Strength of Mortar, Grout, and Masonry: Comply with ASTM C1314.

END OF SECTION

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Brick.
3. Decorative Concrete Masonry.

B. Related Sections:

1. Section 040513 – Masonry Mortaring.
2. Section 040516 – Masonry Grouting.
3. Section 099000 – Painting and Coating.

1.02 SUBMITTALS

A. Product Data:

1. Submit data for masonry units, fabricated wire reinforcement, ties, cavity insulation, weeps, bond breaks, and any other accessories to be used in construction.

B. Samples:

1. Submit two full-size samples of brick and concrete block units to illustrate color, texture, and extremes of color range.

C. Test Reports:

1. Test reports for each type of building and facing brick are to be submitted to the
2. Architect Engineer for approval.
3. Testing and reports are to be completed by an independent laboratory.
4. Test reports shall show:
 - a. Compressive strength.
 - b. 24 - hr. cold water absorption.
 - c. 5 - hr. boil absorption.
 - d. Saturation coefficient.
 - e. Initial rate of absorption (suction).

D. Certificates: Prior to delivery, submit to Engineer certificates attesting compliance with the applicable specifications for grades, types or classes included in these specifications.

SECTION 042000 - UNIT MASONRY

1.03 QUALITY ASSURANCE

- A. Perform Work according to ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures and Related Commentaries.
- B. Fire-Rated Wall Construction: 2-hour rating.
 - 1. Tested Rating: Determined according to ASTM E119.
- C. Surface-Burning Characteristics:
 - 1. Foam Insulation: Maximum 75/450 flame-spread/smoke-developed index when tested according to ASTM E84.
- D. Perform Work according to New York State and local standards.

1.04 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience.

1.05 MOCKUPS

- A. Size: Construct brick and decorative concrete masonry wall mockup, 4feet long by 4 feet high, including masonry, mortar and accessories, and insulation.
- B. Locate where indicated by Engineer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept concrete masonry units on-Site. Inspect for damage.
- B. Store brick off ground to prevent contamination by mud, dust or materials likely to cause staining or other defects.
- C. Cover materials when necessary to protect from elements.
- D. Protect reinforcement from elements

1.07 AMBIENT CONDITIONS

- A. Do not store reinforcing material directly on ground. Utilize blocking, pallets or other methods to prevent rust on accessories prior to installation.
- B. Cold Weather Requirements: According to ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

SECTION 042000 - UNIT MASONRY

- C. Hot Weather Requirements: According to ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.08 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 PERFORMANCE AND DESIGN CRITERIA

- A. Concrete Masonry: Compressive Strength (f'm): 1,500 psi; determined by unit strength method.

2.02 MATERIALS

- A. Hollow Load-Bearing CMU: ASTM C90; normal weight.
- B. Solid Load-Bearing CMU: ASTM C90; normal weight.
- C. CMU Size: Nominal modular size of 16" long by 8" high by width as shown on the plans.
- D. Special shapes: where shown and where required, provide for lintels, corners (bullnose block), jambs, sash, headers, bonding and other special conditions.
- E. Split Rib CMU: ASTM C90; normal weight, 8-rib.
- F. Brick: ASTM C216; Grade SW; Type FBS.

2.03 ACCESSORIES

- A. Single-Wythe Joint Reinforcement: ASTM A951; truss or ladder type; steel 9 gauge; diameter side rods with 9 gauge-diameter cross ties; hot-dip galvanized.
- B. Cavity wall ties:
 - 1. Wire diameter: 3/16 in. (4.7 mm).
 - 2. Shape: Rectangular, at least 2 in. (51 mm) wide with ends overlapped or "Z" with 2 - in. (51 mm) legs.
 - 3. Length: Select length to allow 1 - in. (25 mm) minimum mortar cover of ends or legs.
- C. Mortar and Grout: As specified in Section 040514 - Masonry Mortaring and Grouting.

SECTION 042000 - UNIT MASONRY

- D. Preformed Control Joints: PVC material. Furnish with corner and T-accessories, heat-fused joints. Profile as indicated.
- E. Joint Filler: Closed cell polyethylene; oversized 50 percent to joint width; self-expanding.
- F. Masonry Core Insulation: Perlite fill.
- G. Weeps: Cell Vent Weeps by Wire Bond or approved equal.
- H. Weather Barrier: Henry Air-Bloc 31MR liquid applied breathable weather barrier or approved equal.
- I. Weather Barrier Transition Membrane: Henry Blueskin or approved equal.
- J. Through-Wall Flashing: Henry Blueskin TWF or approved equal.
- K. Mortar Control Device: Mortar Net by Mortar Net Solutions or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that:
 - 1. Field conditions are acceptable and ready to receive Work.
 - 2. Items provided by other Sections of Work are properly sized and located.
 - 3. Built-in items are in proper location and ready for roughing into masonry Work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other Sections.
- B. Furnish temporary bracing during installation of masonry Work. Maintain in place until building structure provides permanent support.

3.03 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of CMU:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.

SECTION 042000 - UNIT MASONRY

D. Placing and Bonding:

1. Lay solid masonry units in full bed of mortar, with full head joints.
2. Lay hollow masonry units with face shell bedding on head and bed joints.
3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
4. Remove excess mortar as Work progresses.
5. Interlock intersections and external corners.
6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
7. Perform Site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
8. Isolate masonry from vertical structural framing members with movement joint as indicated.
9. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler.

E. Fire-Rated Masonry Construction:

1. Install fire-rated masonry in compliance with requirements of ASTM E119 and with the hourly rating indicated on the Drawings.

F. Cavity Wall: Do not permit mortar to drop or accumulate into cavity air space or to plug weeps by installing Mortar Net in cavity. Build inner wythe ahead of outer wythe to receive and weather barrier and through-wall flashing.

G. Joint Reinforcement and Anchorage - Single-Wythe Masonry:

1. Install horizontal joint reinforcement every other course.

H. Lintels:

1. Install loose steel lintels over openings.
2. Maintain minimum 8-inch bearing on each side of opening.

I. Reinforced Masonry:

1. Lay masonry units with cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
2. Place reinforcement bars as indicated.
3. Support and secure reinforcement from displacement.
4. Place and consolidate grout fill without displacing reinforcing.
5. Place grout according to ACI 530.1.

J. Control Joints:

1. Install control joints at the following maximum spacings, unless otherwise indicated on Drawings:
 - a. Exterior Walls: 20 feet o.c. and within 24 inches on one side of each interior and exterior corner.

SECTION 042000 - UNIT MASONRY

- b. Interior Walls: 30 feet o.c.
 - c. At changes in wall height.
- 2. Do not continue horizontal joint reinforcement through control joints.
 - 3. Form control joint with sheet building paper bond breaker fitted to one side of hollow contour end of block unit. Fill resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- K. Expansion Joints:
- 1. Form expansion joints as indicated.
 - 2. Do not continue horizontal joint reinforcement through expansion joints.
- L. Built-in Work:
- 1. As Work progresses, install built-in metal door frames and other items to be built in the Work and furnished by other Sections.
 - 2. Install built-in items plumb and level.
 - 3. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
 - 4. Do not build in materials subject to deterioration.
- M. Cutting and Fitting:
- 1. Cut and fit for chases. Coordinate with other Sections of Work to provide correct size, shape, and location.
 - 2. Obtain Engineer's approval prior to cutting or fitting masonry Work not indicated or where appearance or strength of masonry Work may be impaired.

3.04 TOLERANCES

- A. Maximum Variation from Alignment of walls = $\frac{1}{4}$ inch.
- B. Maximum Variation from Unit to Adjacent Unit: $\frac{1}{16}$ inch.
- C. Maximum Variation from Plane of Wall: $\frac{1}{4}$ inch in 10 feet and $\frac{1}{2}$ inch in 20 feet or more.

3.05 FIELD QUALITY CONTROL

- A. CMU: Test each type according to ASTM C140.
- B. Prism Tests: Test compressive strength of completed reinforced masonry according to ASTM C1314.

SECTION 042000 - UNIT MASONRY

3.06 CLEANING

- A. Clean soiled surfaces with cleaning solution. Solution shall be non-acidic and not harmful to masonry or adjacent materials.

3.07 PROTECTION

- A. Protect exposed external corners subject to damage.
- B. Protect base of walls from mud and mortar splatter.
- C. Protect masonry and other items built into masonry walls from mortar droppings and staining caused by mortar.
- D. Protect tops of masonry Work with waterproof coverings secured in place without damaging masonry. Provide coverings where masonry is exposed to weather when Work is not in progress. Maintain protection on tops of completed exterior walls until installation of permanent waterproof cap materials.

END OF SECTION

SECTION 042000 - UNIT MASONRY

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SECTION 042300 - GLASS UNIT MASONRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Glass masonry units.
2. Mortar bed and pointing mortar.
3. Reinforcing and perimeter treatment accessories.

B. Related Requirements:

1. Section 040513 - Masonry Mortaring: Mortar for glass unit masonry.
2. Section 079000 - Joint Protection: Perimeter caulking.

1.02 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures and Related Commentaries.

B. National Fire Protection Association (NFPA):

1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.

C. ASTM International:

- 1.03 ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
ASTM A951 - Standard Specification for Steel Wire for Masonry Joint Reinforcement.

1.04 COORDINATION

- A. Coordinate Work of this Section with Section 040513 – Masonry Mortaring, and Section 042000 – Unit Masonry.

1.05 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer's literature for glass units, panel reinforcing, panel restraints and anchors, and sealant.
- C. Samples: Submit two glass block units illustrating size variations, color, design, face pattern.

SECTION 042300 - GLASS UNIT MASONRY

- D. Manufacturer's Certificate: Provide documents verifying that the glass block units meet the requirements of the specified Reference Standards.
- E. Test and Evaluation Reports: Submit UL Classification for all fire-rated glass unit masonry products. Show compliance with NFPA 80.
- F. Manufacturer's Instructions: Submit special installation procedures, positioning of reinforcement, and perimeter conditions.

1.06 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store unopened cartons of glass block in a clean, dry area. Protect opened cartons against rain and water run-off with protective covering.
- B. Inspect glass block on-site for damage upon delivery.

1.08 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.
- B. Cold Weather Requirements: According to ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.
- C. Hot Weather Requirements: According to ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

1.09 EXISTING CONDITIONS

- A. Field Measurements: Verify elevations, and opening dimensions, prior to beginning Work. Indicate field measurements on Shop Drawings.

1.10 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for warranties.
- B. Furnish five-year manufacturer's warranty for glass masonry units.

SECTION 042300 - GLASS UNIT MASONRY

PART 2 - PRODUCTS

2.01 GLASS MASONRY ASSEMBLIES

A. Manufacturers:

1. J.Weck GmbH
2. Pittsburgh Corning Corporation
3. Substitutions: Section 016000 - Product Requirements.

2.02 MATERIALS

A. Solid Glass Units:

1. Nominal Size: 8 inch by 8 inch by 3 inch thick.
2. Color: Clear glass.
3. Pattern Type: clear.

B. Mortar: As specified in Section 040514 - Masonry Mortaring and Grouting.

C. Perimeter Sealant: type, as specified in Section 079000 - Joint Protection .

2.03 MORTAR MIXES

A. Mortar: Type S in accordance with ASTM C270. Mortar shall be 1 part Portland Cement, ½ part lime, and sand equal to 2 ¼ to 3 times the amount of cementitious material (cement plus lime), all measures by volume. For exterior glass block panels, an integral type waterproofer should be added to the mortar mix. No antifreeze compounds or accelerators allowed.

1. Portland Cement: Type 1 in accordance with ASTM C150. If a waterproof Portland Cement is used, the intergral type waterproofer shall be omitted. (Masonry Cement is not recommended) Color: White
2. Lime: Type S, in accordance with ASTM C207. Shall be a pressure-hydrated dolomitic lime, provided that not less than 92% of all the active ingredients are completely hydrated.
3. Sand: A clean, white quartzite or silica type, essentially free of iron compounds, for thin joints, in accordance with ASTM C144, not less than 100% passing a No. 8 sleeve.
4. Integral Type Water Repellant: Stearate type by Sonneborn Building Products (Hydrocide Powder, 1-800-243-6739), or equal. Note: Add hydrocide powder to dry mortar mix. Do not add powder to wet mortar mix.
5. External Type Waterproofer: Water based silane sealer type by Harris Specialty Chemicals, Inc. (ENVIROSEAL™ 20 or HYDROZO CLEAR 20, 1-800-327-1570). Note: Remove excess sealer from glass surfaces soon after application.

B. Mortar for Glass Unit Masonry: ASTM C270, Type S.

C. Mix mortar ingredients according to manufacturer's instructions.

SECTION 042300 - GLASS UNIT MASONRY

2.04 ACCESSORIES

- A. Panel Reinforcing: two parallel 9-gauge wires either 1 5/8 inch or 2 inch on center with electrically butt-welded cross-wires spaced at regular intervals, galvanized after welding.
- B. Expansion Strips: made of polyethylene foam with a thickness of 3/8 inch.
- C. Asphalt Emulsion: a water-based asphalt emulsion, by Karnak Chemical Corp., or equal.
- D. Sealant (caulk): non-staining, waterproof mastic, silicone type.
- E. Packing (Backer Rods): polyethylene foam, neoprene, fibrous glass or equal as approved by sealant manufacturer.
- F. Perimeter Channel: Galvanized steel channel profile, 14 gauge, one piece per length installed.
- G. Prime and finish paint per the requirements of Section 099000 – Painting and Coating, for galvanized metal.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify that channels or panel anchors have been provided at head and jambs for the purpose of providing panel support within the opening.
- B. Mix all mortar components to a consistency that is drier than mortar for ordinary masonry. Retempering the mortar after it has taken its initial set shall not be permitted. Do not use antifreeze compounds or accelerators.
- C. Freshly mixed mortar may create skin irritation. Avoid direct contact where possible and wash exposed skin areas promptly with water. If any mortar gets into the eyes, rinse immediately with water and get prompt medical attention.

3.02 INSTALLATION

- A. Cover sill area with a heavy coat of asphalt emulsion. Allow emulsion to dry at least 2 hours before placing mortar.
- B. Where panel anchors are used at jambs and heads in lieu of channel or chase surrounds, install panel anchors in the same joints (16 inches o.c. maximum) where panel reinforcing will be laid. EXCEPT THAT, at panel corners, anchors shall be placed in each mortar joint, both at the jamb and head, 24 inches on each side of the corner. Install panel anchors across head joint spaced 16 inches o.c. maximum.
- C. Adhere expansion strips to jambs and head. Make certain expansion strip extends to sill and covers leg of panel anchor which is attached to jambs and head.

SECTION 042300 - GLASS UNIT MASONRY

- D. Set a full mortar bed joint, applied to sill.
- E. Set lower course of block. Maintain a uniform joint width of 1/4 to 3/8 inch plus or minus 1/8 inch. All mortar joints must be full and not furrowed. Steel tools must not be used to tap blocks into position. (Place a rubber crutch tip on end of trowel to tap block into position). Do not realign, tap or otherwise move block after initial placement.
- F. Install panel reinforcing every 16 inches o.c. maximum in the horizontal mortar joint and in joints immediately above and below all openings within panels. Run reinforcing continuously from end to end of panels. Lap reinforcing not less than 6 inches whenever it is necessary to use more than one length. NOTE: In corrosive atmospheres, (i.e. saline air, chlorine air, etc.), the use of stainless steel channels, reinforcing and panel anchors shall be used.
- G. Place full mortar bed for joints not requiring panel reinforcing-do not furrow. Maintain uniform joint width.
- H. Set succeeding courses of block. Space at head of panel and jambs must remain free of mortar for caulking with sealant.
- I. Use only wooden or rubber tipped tools when tapping glass blocks in place.
- J. Strike joints smooth while mortar is still plastic and before final set. Remove surplus mortar from faces of glass blocks and wipe dry. (See Section 3.03). Tool joints smooth and concave before mortar takes final set. At this time, remove and clean out all excess mortar from jamb, head and other locations.
- K. After final mortar set (approximately 24 hours), install packing tightly between glass block panel and jamb and head construction. Leave space for sealing.
- L. Apply sealant evenly to the full depth of recesses as indicated on the drawings and in accordance with the manufacturer's application manual and instructions.
- M. All exterior glass block panels shall be well sealed to prevent water entry.

3.03 CLEANING

- A. Remove surplus mortar from the faces of the glass block at the time joints are struck or tooled. Mortar should be removed while it is still plastic using a clean, wet sponge or an ordinary household scrub brush having stiff bristles.
- B. Do not use harsh cleaners, acids (of any strength), abrasives or alkaline material while cleaning glass block. Never use a wire brush to remove mortar from glass block surfaces.
- C. Final mortar removal is accomplished with a clean, wet sponge or cloth. Rinse sponge or cloth frequently in clean water to remove abrasive particles that could scratch glass surfaces. Allow any remaining film on the block to dry to a powder.
- D. After all organic sealants, caulking, etc., have been applied, remove excess caulking materials with commercial solvents such as xylene, toluene, mineral spirits or naphtha and

SECTION 042300 - GLASS UNIT MASONRY

follow with normal wash and rinse. Be careful not to damage caulking by overgenerous application of strong solvents. Comply with solvent manufacturer's directions on label for toxicity and flammability warnings.

- E. Final cleaning of glass block panels is accomplished after they are completely installed. Wait until panels are not exposed to direct sunlight. Start at the top of the panel and wash with generous amounts of clean water. Dry all water from the glass block surface. Change cloth frequently to eliminate dried mortar particles or aggregate that could scratch the glass surface. To remove the dry powder from the glass surfaces, use a clean, dry, soft cloth. For stubborn or hard to remove powder or stains, the use of an "extra fine" steel wool (grades 000 or 0000) is suggested. Try this first in an unobtrusive area.

END OF SECTION

DIVISION 5

METALS

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Structural shapes.
 - 2. Channels and angles.
 - 3. Hollow structural sections.
 - 4. Structural pipe.
 - 5. Structural plates and bars.
 - 6. Floor plates.
 - 7. Bolts, connectors, and anchors.
 - 8. Grout.

1.02 RELATED REQUIREMENTS

- A. Section 053123 – Steel Roof Decking: Support framing for openings in roof deck.
- B. Section 099000 – Painting and Coating: Structural steel framing finish painting.

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and bolts.
 - 2. Connections.
 - 3. Cambers.
 - 4. Indicate welded connections with AWS A2.4 welding symbols, and indicate net weld lengths.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
- D. Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis.
- E. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

SECTION 051200 - STRUCTURAL STEEL FRAMING

G. Qualifications Statements:

1. Submit qualifications for fabricator, erector, shop painter, and welders.

1.04 QUALITY ASSURANCE

A. Perform Work according to following:

1. Structural Steel: AISC 303.
2. Architecturally Exposed Structural Steel: AISC 303, Section 10.
3. High-Strength Bolted Connections: RCSC - Specification for Structural Joints Using ASTM A325 or ASTM A490Bolts.

B. Perform Work according to New York State Department of Transportation Standards.

C. Fabricator:

1. Company specializing in fabricating products specified in this Section with minimum three documented experience with following current AISC Certification:
 - a. Standard Steel Building Structures (STD).
 - b. Conventional Steel Building Structures (SBD).

D. Erector:

1. Company specializing in performing Work of this Section with minimum three years' documented experience with following current AISC Certification:
 - a. Certified Steel Erector (CSE).
 - b. Advanced Certified Steel Erector (ACSE).

E. Shop Painter:

1. Company specializing in performing Work of this Section with minimum three years' documented experience with following current AISC Certification:
 - a. Sophisticated Paint Endorsement - Enclosed (P1).
 - b. Sophisticated Paint Endorsement - Covered (P2).
 - c. Sophisticated Paint Endorsement - Outside (P3).

F. Welders and Welding Procedures: AWS D1.1 qualified within previous 12 months.

PART 2 - PRODUCTS

2.01 STRUCTURAL STEEL

- #### A. Structural W Shapes: ASTM A992; Grade 50.

SECTION 051200 - STRUCTURAL STEEL FRAMING

- B. Structural T Shapes: Cut from structural W shapes.
- C. Channels and Angles: ASTM A36.
- D. Round, Hollow Structural Sections: ASTM A500, Grade B.
- E. Rectangular, Hollow Structural Sections: ASTM A500, Grade B.
- F. Structural Plates and Bars: ASTM A36.
- G. Floor Plates: ASTM A786; raised pattern.

2.02 BOLTS, CONNECTORS, AND ANCHORS

- A. Bolts: Heavy-hex, structural type.
 - 1. ASTM A325; Type 1, galvanized, or Type 3, plain.
 - 2. ASTM A490; Type 1 or 3, plain.
- B. Nuts: ASTM A563; heavy-hex type.
 - 1. Finish: Hot-dip galvanized.
- C. Washers:
 - 1. ASTM F436.
 - 2. Type 1, circular.
 - 3. Finish: Hot-dip galvanized.
- D. Shear Connectors:
 - 1. ASTM A108.
 - 2. Grade 1015, headed, unfinished, and according to AWS D1.1.
 - 3. Type B.
- E. Anchor Rods:
 - 1. ASTM F1554; Grade 55, weldable.
 - 2. Shape: as indicated on Drawings.
 - 3. Plate Washers: ASTM A36.
- F. Threaded Rods:
 - 1. ASTM A36.
 - 2. Finish: Hot-dip galvanized.
- G. Forged Structural Steel Hardware:
 - 1. Clevises and Turnbuckles: ASTM A108; Grade 1085.
 - 2. Eye Nuts and Eye Bolts: ASTM A108; Grade 1030.
 - 3. Sleeve Nuts: ASTM A108; Grade 1018.

SECTION 051200 - STRUCTURAL STEEL FRAMING

4. Rod Ends, Yoke Ends and Pins, Cotter Pins, and Coupling Nuts: Carbon steel.

2.03 WELDING MATERIALS

A. Welding Materials:

1. AWS D1.1.
2. Type required for materials being welded.

2.04 FABRICATION

- A. Space shear stud connectors as unless indicated otherwise on Drawings.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Develop required camber for members.

2.05 FINISHES

A. Structural Steel:

1. Shop Primer: SSPC Paint 15, Type 1, Red Oxide.
2. Touchup Primer: Match shop primer.
3. Finish: Field per Section 099000.

B. Galvanizing for Bolts, Connectors, and Anchors:

1. Hot-Dip Galvanizing:
 - a. Bolts, Nuts, and Washers: ASTM F2329.
 - b. Connectors and Anchors: ASTM A153.
2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.06 ACCESSORIES

A. Grout:

1. Non-shrink type; premixed compound consisting of nonmetallic aggregate, cement, water-reducing, and plasticizing additives.
2. Capable of developing minimum compressive strength of 5000 psi at 28 days.

SECTION 051200 - STRUCTURAL STEEL FRAMING

- B. Touchup Primer for Galvanized Surfaces:
 - 1. SSPC Paint 20, Type I - Inorganic.
 - 2. Comply with ASTM A780.

2.07 SOURCE QUALITY CONTROL

- A. Testing: Test bolted and welded connections as specified in PART 3 for field quality control tests.
- B. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 - 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that bearing surfaces are at correct elevation.
- B. Verify that anchor rods are set in correct locations and arrangements, with correct exposure for steel attachment.

3.02 PREPARATION

- A. Furnish templates for installation of anchor rods and embedments in concrete and masonry work.

3.03 ERECTION

- A. Allow for erection loads and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
- B. Field-weld components and shear connectors as indicated on Drawings.
- C. Field-connect members with threaded fasteners; torque to required resistance and snug-tighten for bearing-type connections.
- D. Do not field-cut or alter structural members without approval of Architect/Engineer.
- E. After erection, touch up welds and abrasions to match shop finishes.

SECTION 051200 - STRUCTURAL STEEL FRAMING

3.04 GROUT INSTALLATION

- A. Shim bearing plates and equipment supports to proper elevation, and snug-tighten anchor bolts.
- B. Fill void under bearing surface with grout; install and pack grout to remove air pockets.
- C. Moist-cure grout.
- D. Remove forms after grout is set; trim grout edges to form smooth surface, splayed 45 degrees.
- E. Tighten anchor bolts after grout has cured for a minimum of three days.

3.05 TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, noncumulative.
- B. Maximum Offset from Alignment: 1/4 inch.

3.06 FIELD QUALITY CONTROL

- A. Bolted Connections: Inspect according to AISC 303.
 - 1. Visually inspect all bolted connections.
 - 2. Direct Tension Indicators: Comply with requirements of ASTM F959, and verify that gaps are less than gaps specified in Table 2.
- B. Welding: Inspect welds according to AWS D1.1.
 - 1. Use certified welders, and conduct inspections and tests as required. Record types and locations of defects found in Work. Record work required and performed to correct deficiencies.
 - 2. Visually inspect all welds.
 - 3. Ultrasonic Inspection: ASTM E164; perform on each full-penetration weld.
 - 4. Liquid Penetrant Inspection: ASTM E165.
- C. Correct defective bolted connections and welds.

END OF SECTION

SECTION 053123 - STEEL ROOF DECKING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Steel roof deck and accessories.
2. Framing for openings up to and including 18 inches.

B. Related Sections:

1. Section 051200 - Structural Steel Framing: Support framing for deck openings.

1.02 REFERENCES

A. American Society of Civil Engineers:

1. ASCE 3 - Standard Practice for the Construction and Inspection of Composite Slabs.

B. ASTM International:

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Baked Hardenable.

C. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.

D. Steel Deck Institute:

1. SDI 29 - Design Manual for Composite Decks, Form Decks and Roof Decks.

E. SSPC: The Society for Protective Coatings:

1. SSPC Paint 15 - Steel Joist Shop Paint.

1.03 PERFORMANCE REQUIREMENTS

A. Design metal deck in accordance with SDI 29 Design Manual.

B. Calculate to structural working stress design and maximum vertical deck deflection of 1/240.

SECTION 053123 - STEEL ROOF DECKING

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal requirements.
- B. Shop Drawings: Indicate deck plan, support locations, Projections, openings, pertinent details, and accessories.
- C. Product Data: Submit deck profile characteristics and dimensions, structural properties, and finishes.
- D. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions.
- E. Manufacturer's Certificate: Products meet or exceed specified requirements.
- F. Welders Certificates: Certify welders employed on Work, verifying AWS qualification within previous 12 months.

1.05 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum three years' experience and approved by manufacturer.
- B. Design deck layout, spans, fastening, joints, under direct supervision of professional engineer experienced in design of this Work and licensed in State of New York.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Cut plastic wrap to encourage ventilation.
- C. Store deck on dry wood sleepers; slope for positive drainage.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Manufacturers:
 - 1. A manufacturer offering steel roof deck products to be incorporated into the work must be a member of the Steel Deck Institute.
- B. Sheet Steel: ASTM A653, Grade 33 Structural Quality; with G30 galvanized coating.
- C. Welding Materials: AWS D1.1.

SECTION 053123 - STEEL ROOF DECKING

2.02 ACCESSORIES

- A. Sump Pans, Sump Plates, Valley Strips, Eave Strips: Fabricated of metal of same type and finish as deck.

2.03 FABRICATION

- A. Metal Deck: Sheet steel, configured as follows:
 - 1. Span Design: multiple.
 - 2. Minimum Metal Thickness Excluding Finish: 20 gage.
 - 3. Minimum Section Properties (per foot width): $S=0.501 \text{ in}^3/\text{ft}$, $I= 0.848 \text{ in}^4/\text{ft}$.
 - 4. Minimum Allowable Diaphragm Shear: 3287 plf.
 - 5. Nominal Height: 3 inch, fluted profile to SDI Deep Rib.
 - 6. Formed Sheet Width: 24 inch.
 - 7. Side Joints: lapped.
 - 8. Flute Sides: plain vertical face.
- B. Related Deck Accessories: Metal closure strips, 20 gage thick [galvanized] sheet steel; of profile and size [as indicated on drawings].
- C. Roof Sump Pan: Fabricate of 14 gage sheet steel, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.
- D. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.

3.02 INSTALLATION

- A. Erect metal deck in accordance with SDI Manual.
- B. Bear deck on steel supports with 3 inch minimum bearing. Align and level.
- C. Fasten ribbed deck to steel support members at ends and intermediate supports with fusion welds through weld washers at 12 inches oc maximum, parallel with deck flute and at each transverse flute.
- D. Weld in accordance with AWS D1.1.
- E. Mechanically crimp, button punch, screw, or puddle weld male/female side laps at 24 inches oc maximum.

SECTION 053123 - STEEL ROOF DECKING

- F. Reinforce steel deck openings from 6 to 18 inches in size with 2 x 2 x 1/4 inch steel angles. Place framing angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
- G. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.
- H. Position roof sump pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

3.03 FIELD QUALITY CONTROL

- A. Welding: Inspect welds in accordance with AWS D1.1.

END OF SECTION

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Loose steel lintels.
2. Steel angle supports at roof deck openings.
3. Fish bin.
4. Rolling platform.

B. Related Requirements:

1. Section 042000 - Unit Masonry.
2. Section 040100 - Maintenance of Masonry.
3. Section 053123 - Steel Roof Deck.

1.02 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
4. ASTM A992 - Standard Specification for Structural Steel Shapes.
5. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.

1.03 SUBMITTALS

- ##### A. Shop Drawings: Indicate profile, size, steel grade.

1.04 QUALITY ASSURANCE

- ##### A. Perform Work according to AISC Manual of Steel Construction.

1.05 DELIVERY, STORAGE, AND HANDLING

- ##### A. Inspection: Accept metal fabrications on-Site in labeled shipments. Inspect for damage.
- ##### B. Protect metal fabrications from damage by exposure to weather or by ground contact.

SECTION 055000 - METAL FABRICATIONS

1.06 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 LINTELS

- A. Description:
 - 1. Size and Configuration:
 - a. As indicated on Drawings.
 - b. Length to allow 6 inch minimum bearing on both sides of opening.
 - 2. Finish: Hot dip galvanized.

2.02 ROOF DECK OPENINGS 6 INCHES TO 18 INCHES:

- A. Description:
 - 1. L2"x2"x1/4" A36 steel angle.
 - 2. Place framing angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
 - 3. Finish: Hot dip galvanized.

2.03 SCREENINGS BASKET

- A. Steel Frame:
 - 1. L3" x 3" x 1/4" A36 steel angle.
 - 2. Size and configuration:
 - a. As indicated on drawings.
 - 3. Finish: Hot dip galvanized.
- B. Mesh:
 - 1. 1/2" Woven Steel Mesh, 0.1200" wire.
 - 2. Size and configuration:
 - a. As indicated on drawings.
 - 3. Finish: Stainless Steel Type 316.

2.04 ROLLING PLATFORM

- A. Provide one mobile work platform.
- B. 36" x 36" platform.
- C. 3 steps.
- D. Handrails.

SECTION 055000 - METAL FABRICATIONS

- E. Manufacturers standard gray finish.
- F. As manufactured by Tri-Arc.

2.05 MATERIALS

- A. Steel:
 - 1. Angles: ASTM A36

2.06 FABRICATION

- A. Fit and shop-assemble items in largest practical sections for delivery to Site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Fabrication Tolerances:
 - 1. Squareness: 1/8 inch maximum difference in diagonal measurements.
 - 2. Maximum Offset between Faces: 1/16 inch.
 - 3. Maximum Misalignment of Adjacent Members: 1/16 inch.
 - 4. Maximum Bow: 1/8 inch in 48 inches.
 - 5. Maximum Deviation from Plane: 1/16 inch in 48 inches.

2.07 FINISHES

- A. Steel:
 - 1. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.
 - 2. Touchup Primer for Galvanized Surfaces:
 - a. SSPC Paint 20, Type I – Inorganic.
 - b. ASTM A780.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive Work.

3.02 INSTALLATION

- A. Install items plumb and level, accurately fitted, and free from distortion or defects.
- B. Make provisions for erection stresses. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed.
- C. Obtain approval of Architect/Engineer prior to Site cutting or making adjustments not scheduled.

SECTION 055000 - METAL FABRICATIONS

3.03 TOLERANCES

- A. Maximum Variation from Level: 1/16 inch in 3 feet Maximum Offset from Alignment: 1/4 inch.
- B. Maximum Out-of-Position: 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. After erection, touch up damaged finishes with galvanizing repair paint to match shop finishes.
- B. Touch up factory-applied finishes according to manufacturer-recommended procedures.

END OF SECTION

DIVISION 6

WOOD, PLASTICS, AND COMPOSITES

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Structural floor, wall, and roof framing.
2. Built-up structural beams and columns.
3. Engineered trusses.
4. Shear walls.
5. Floor, wall, and roof sheathing.
6. Sill flashings.
7. Preservative treatment of wood.
8. Fire-retardant treatment of wood.
9. Miscellaneous framing and sheathing.
10. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, and other casework.
11. Fascia board.

1.02 SUBMITTALS

- A. Product Data: Submit technical data on insulated sheathing, wood preservative materials, and application instructions.
- B. Shop Drawings for Engineered Truss: Indicate dimensions, wood species and grades, component profiles, drilled holes, fasteners, connectors, erection details, and sequence. Drawing shall be stamped by a Professional Engineer licensed in New York State.

1.03 QUALITY ASSURANCE

- A. Lumber Grading Agency: Certified by U.S. Department of Commerce (DOC) PS 20.
- B. Wood Structural Panel Grading Agency: Certified by APA-The Engineered Wood Association.
- C. Lumber: DOC PS 20.
- D. Wood Structural Panels: DOC PS 1 or DOC PS 2.
- E. Fire-Rated Wall, Floor, Roof Construction: Rating as indicated on drawings.
1. Tested Rating: Determined according to ASTM E119.
 2. Prescriptive Rating: determined according to Building Code of New York State (BCNYS).

SECTION 061000 - ROUGH CARPENTRY

- F. Surface-Burning Characteristics:
 - 1. Fire-Retardant-Treated Materials: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.
- G. Apply label from agency approved by authority having jurisdiction to identify each preservative-treated and fire-retardant-treated material.
- H. Perform Work according to State and Local standards.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect trusses from warping or other distortion by either stacking in vertical position, braced to resist movement, or stacking in horizontal position on level, dry lumber to keep trusses off the ground and without deflection.

PART 2 - PRODUCTS

2.01 ENGINEERED WOOD PRODUCTS

- A. Engineered Wood Products:
 - 1. Manufactured with an exterior-type adhesive complying with ASTM D 2559.
 - 2. Evaluated and monitored according to ASTM D 5456.
- B. Types:
 - 1. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths.
 - 2. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths.

2.02 PRE-ENGINEERED SHEAR WALL PANELS

- A. Manufacturer List:
 - 1. Simpson Strong-Tie.
 - 2. Substitutions: Permitted as approved by the Engineer.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer and as indicated by ASTM D1990. Determine values from manufacturer's published empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Wood-Framed Shear Wall Panels: Prefabricated assembly consisting of wood perimeter framing, tie-downs, and Exposure 1, Structural I plywood, or OSB sheathing.

SECTION 061000 - ROUGH CARPENTRY

- D. Steel-Framed Shear Wall Panels: Prefabricated assembly consisting of cold-formed galvanized steel panel, steel top and bottom plates, and wood studs.

2.03 FIREBLOCKING AND DRAFTSTOPPING

- A. Fireblocking: Solid lumber, structural wood panel, or particleboard.
 - 1. Solid lumber nominal 2 inches thick.
 - 2. Structural wood panel 23/32 inch thick with joints backed by structural wood panel.
 - 3. Particleboard 3/4 inch thick with joints backed by particleboard.
- B. Draftstopping: Gypsum board, wood structural panel, or particleboard.
 - 1. Gypsum board, 1/2 inch thick.
 - 2. Wood structural panel, 3/8 inch thick.
 - 3. Particleboard, 3/8 inch thick.

2.04 LUMBER MATERIALS

- A. Lumber Grading Rules: APA, NELMA, NHLA, SPIB, WCLIB, WWPA.
- B. General Framing: Beams, joists, rafters, studs and blocking: No. 1 or No. 2 spruce-pine-fir, douglas fir-larch, hem-fir, southern yellow pine.
- C. Other concealed non-structural framing and blocking: no. 3 grade of the species listed for general framing.

2.05 SHEATHING MATERIALS

- A. Wood Structural Panel Roof Sheathing: APA-rated sheathing; plywood oriented strand board; Span Rating: 40/20; thickness: 5/8"; Exposure Durability: exterior.
- B. Wood Structural Panel Wall Sheathing: APA-rated sheathing; plywood, oriented strand board; Span Rating: 32/16; thickness 1/2"; Exposure Durability: exterior.
- C. Glass Mat Gypsum Board Wall Sheathing: ASTM C1177; Type X fire resistant, 1/2 inch thick.
- D. Fiber-Reinforced Gypsum Wall Sheathing: ASTM C1277; square or tongue-and-groove edges, 1/2 inch thick.
- E. Wood Structural Panel Floor Sheathing: APA-rated sheathing, plywood or oriented strand board; Span Rating 48/24 thickness 3/4"; Exposure Durability exterior.

SECTION 061000 - ROUGH CARPENTRY

2.06 UNDERLAYMENT MATERIALS

- A. Plywood Underlayment: APA underlayment; Span Rating 32/16; thickness 1/4"; Exposure Durability: exterior.

2.07 FACTORY WOOD TREATMENT

- A. Wood Preservative (Pressure Treatment): AWPA U1, commodity specification A-sawn products or F-wood composites using waterborne preservative.
- B. Wood Preservative (Surface Application): Clear, type.
- C. Fire-Retardant Treatment: Chemically treated and pressure impregnated; having flame spread of 25 or less when tested according to ASTM E 84 and showing no evidence of significant progressive combustion when test is continued for an additional 20-minute period; interior type.
- D. Moisture Content after Treatment: Kiln dried (KDAT).
 - 1. Lumber: Maximum 19 percent.
 - 2. Structural Panels: Maximum 15 percent.

2.08 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Fasteners: ASTM A153, hot-dip galvanized or stainless steel for high-humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Nails and Staples: ASTM F1667.
 - 3. Drywall Screws: Bugle head, hardened steel, power-driven type, length of three times thickness of sheathing.
 - 4. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.
- B. Die-Stamped Connectors: hot-dip galvanized steel.
- C. Structural Framing Connectors, Joist Hangers: Hot-dip galvanized steel, sized to suit framing conditions.
- D. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed-cell polyethylene foam from continuous rolls.
- E. Sill Flashing (Under Sill Gasket): 6 mil thick, clear polyethylene sheet.
- F. Subfloor Glue: EWA AFG-01, waterproof of water base, air cure type, cartridge dispensed.
- G. Building Paper: ASTM D226; Type I, No. 15 unperforated asphalt felt.

SECTION 061000 - ROUGH CARPENTRY

- H. Building Paper: Plain, untreated cellulose building paper.
- I. Termite Shield: Galvanized sheet steel, 26 gauge.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that lumber is free of defects and damage that will impair quality of rough carpentry.

3.02 PREPARATION

- A. Adjacent Surfaces: Protect adjacent surfaces as needed.
- B. Cleaning: Clean all surfaces that will come in contact with carpentry.

3.03 APPLICATION

- A. Framing:
 1. Carefully select all members. Select individual pieces so that knots and defects will not interfere with placement of bolts, when nailing or making connections. Discard defective pieces.
 2. Set structural members level and plumb, in correct position.
 3. Fasten framing according to the requirements of BCNYS.
 4. Make provisions for erection loads and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.
 5. Place horizontal members, crown side up.
 6. Construct load-bearing framing and curb members full length without splices.
 7. Double members at openings over 60 inches wide. Space short studs over and under opening to stud spacing.
 8. Construct double joist headers at floor and ceiling openings and under wall stud partitions parallel to floor joists. Frame rigidly into joists.
 9. Install shear wall panels to comply with manufacturer's written instructions.
 10. Block or diagonally bridge joists at intervals not exceeding 8 feet. Fit solid blocking or diagonal bridging at ends of members.
 11. Place full-width continuous sill flashings under framed walls on cementitious foundations. Lap flashing joint 4 inches.
 12. Place sill gasket directly on sill flashing. Puncture gasket clean, and fit tight to protruding foundation anchor bolts.
 13. Coordinate installation of glue-laminated structural units, prefabricated wood trusses and wood I-joists.
 14. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

SECTION 061000 - ROUGH CARPENTRY

15. Coordinate curb installation with installation of decking and support of deck openings and roofing vapor retardant.

B. Sheathing:

1. Install gypsum sheathing according to ASTM C1280.
2. Fasten sheathing according to the requirements of BCNYS.
3. Secure roof sheathing with longer edge (strength axis) perpendicular to framing members and with ends staggered and sheet ends over bearing.
4. Use sheathing clips between sheets between roof framing members. Fully engage tongue-and-groove edges.
5. Place building paper horizontally over wall sheathing; weather lap edges and ends.
6. Secure wall sheathing with long dimension parallel to wall studs, with ends over firm bearing and staggered.
7. Secure subfloor sheathing with longer edge perpendicular to floor framing, with end joints staggered and sheet ends over bearing. Attach with subfloor glue and #8 x 1 3/4" course thread underlayment screws at 12" spacing.
8. Place building paper between floor underlayment and subflooring.
9. Install flooring underlayment after dust- and dirt-generating activities have ceased and prior to application of finished flooring. Apply perpendicular to subflooring; stagger joints of underlayment. Secure with square drive screws at 12" spacing.

C. Fireblocking and Draftstopping:

1. Install fireblocking to cut off concealed draft openings.
 - a. Concealed Framed Wall and Furred Spaces: Install fireblocking vertically at floor and ceiling levels and horizontally at maximum 10 feet o.c.
 - b. Connections between Horizontal and Vertical Spaces: Install fireblocking between vertical walls and partitions and the following:
 - 1) Horizontal floor and roof framing.
 - 2) Soffits, dropped ceilings, cove ceilings, and other horizontal concealed spaces.
 - c. Stairs: Install fireblocking between stair stringers at top and bottom of each run.
 - d. Exterior Combustible Architectural Trim: Install fireblocking at maximum 20 feet o.c.
2. Install draftstopping in floors and attics at locations indicated.
 - a. Floors and Attics: In line with dwelling unit and sleeping unit separations.

SECTION 061000 - ROUGH CARPENTRY

- D. Blocking for fixtures, cabinetry, and casework:
 - 1. Install blocking and supports for attachment of fixtures anchored to walls and for attachment of mechanical and electrical items within walls.
 - 2. Install supports for cabinetry and casework.
- E. Site-Applied Wood Treatment:
 - 1. Brush-apply two coats of preservative treatment on wood in contact with cementitious materials or exposed to the weather.
 - 2. Treat Site-sawn cuts. Apply preservative to Site-sawn cuts according to AWWA M4.
 - 3. Allow preservative to dry prior to erecting members.

3.04 TOLERANCES

- A. Framing and Furring Members to Receive a Finished Wall or Ceiling: Align finish surface to vary not more than 1/8 inch from a theoretical plane or surfaces of the room or space.
- B. Other Framing Members: 1/4 inch from indicated position, maximum.
- C. Surface Flatness of Floor: 1/4 inch in 10 feet minimum, and 1/2 inch in 30 feet maximum.

3.05 FIELD QUALITY CONTROL

- A. Owner will inspect for workmanship.

END OF SECTION

SECTION 061000 - ROUGH CARPENTRY

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SECTION 066000 - FIBERGLASS REINFORCED POLYMER (FRP)
PRODUCTS AND FABRICATIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. FRP Grates and Angles at floor openings.
 2. FRP Ladders.
 3. FRP Screening Trough.

1.02 REFERENCE STANDARDS

- A. ANSI/ACMA/FGMC FRP Composites Grating Manual for Pultruded and Molded Grating and Stair Treads.

1.03 SUBMITTALS:

- A. Shop drawings of all fabricated pultruded gratings, treads, and ladders shall be submitted to the Design Engineer for approval in accordance with the requirements of Section 013300. Fabrication shall not start until receipt of Design Engineer's approval marked "Approved As Submitted" or "Approved As Noted".
- B. Manufacturer's catalog data showing:
1. Materials of construction
 2. Dimensions, spacings, and construction of grating, handrails and ladders.
- C. Detail shop drawings showing:
1. Dimensions
 2. Sectional assembly
 3. Location and identification mark
 4. Size and type of supporting frames required

1.04 QUALITY ASSURANCE:

- A. The material covered by these specifications shall be furnished by an ISO-9001:2008 certified manufacturer of proven ability who is regularly engaged in the manufacture, fabrication and installation of FRP systems and fabrications.
- B. Substitution of any component or modification of system shall be made only when approved by the Engineer.

SECTION 066000 - FIBERGLASS REINFORCED POLYMER (FRP)
PRODUCTS AND FABRICATIONS

- C. Fabricator Qualifications: Firm experienced in successfully producing FRP fabrications similar to that indicated for this project, with sufficient production capacity to produce required units without causing delay in the work.
- D. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work.
- E. The design criteria of the FRP pultruded grating, and ladders including connections, shall be in accordance with governing building codes and accepted standards in the FRP composites industry.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. All materials and equipment necessary for the fabrication and installation of pultruded gratings and treads and appurtenances shall be stored before, during, and after shipment in a manner to prevent cracking, twisting, bending, breaking, chipping or damage of any kind to the materials or equipment, including damage due to over exposure to the sun. Any material which, in the opinion of the Design Engineer, has become damaged as to be unfit for use, shall be promptly removed from the site of work, and the Contractor shall receive no compensation for the damaged material or its removal.
- B. Identify and match-mark all materials, items and fabrications for installation and field assembly.

1.06 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Materials used in the manufacture of the FRP products shall be raw materials in conformance with the specification and certified as meeting the manufacturer's approved list of raw materials.
- B. All raw materials shall be as specified by the contract.
- C. The visual quality of the pultruded shapes shall conform to ASTM D4385.
- D. Ladder and railing systems shall meet the requirements of OSHA 1910.27.
- E. FRP pultruded grating and treads shall be manufactured using a pultruded process utilizing select polyester resin with flame retardant and ultraviolet (UV) inhibitor additives. A synthetic surface veil fabric shall encase the glass reinforcement. FRP shapes shall achieve a flame spread rating of 25 or less in accordance with ASTM test

SECTION 066000 - FIBERGLASS REINFORCED POLYMER (FRP)
PRODUCTS AND FABRICATIONS

method E-84, the flammability characteristics of UL 94 V0 and the self-extinguishing requirements of ASTM D635.

- F. If required, after fabrication, all cut ends, holes and abrasions of FRP shapes shall be sealed with a compatible resin coating.
- G. FRP products exposed to weather shall contain an ultraviolet inhibitor.
- H. Pultruded FRP products shall be manufactured and fabricated in the USA. Manufacturer shall provide a written Certificate of Compliance.
- I. Gratings: Design live loads of FRP gratings for walkway applications shall be 100 psf (2.87 kN/m²) uniformly distributed load per ASCE 7 or as required by the governing building code with a maximum deflection of 0.25" (6.4mm) at the center of a simple span.
- J. Structural support members shall not deflect more than L/180 of span for structural members unless specifically stated otherwise in drawings and/or supplementary conditions. Connections shall be designed to transfer the design loads.
- K. Temperature exposure is limited to 100°F unless specifically stated otherwise in drawings and/or supplementary conditions.
- L. All gratings and components shall be shop fabricated and assembled into the largest practical size suitable for transporting.

2.02 PULTRUDED GRATINGS

A. General

- 1. Grating shall be shipped from the manufacturer, palletized and banded with exposed edges protected to prevent damage in shipment.
- 2. Each piece shall be clearly marked showing manufacturer's applicable drawing number.
- 3. Grating shall be DURADEK® T-5000 as manufactured by Strongwell.
- 4. Substitutions: Permitted as approved by the Engineer.

B. Design

- 1. Floor grating panels shall be 2 inches deep.
- 2. The bearing bars shall be joined into panels by passing continuous length fiberglass pultruded cross rods through the web of each bearing bar. A continuous fiberglass pultruded bar shaped section shall be wedged between the two cross rod spacers mechanically locking the notches in the cross rod spacers to the web of the bearing bars. Continuous adhesive bonding shall be achieved between the cross rod spacers and the bearing web and between the bar shaped wedge and the two cross rod spacers locking the entire panel together to give a panel that resists twist and prevents internal movement of the bearing bars. Each stair tread shall utilize a box-shaped nosing on its lead edge to enclose cross rods and ensure a smooth vertical edge.

SECTION 066000 - FIBERGLASS REINFORCED POLYMER (FRP)
PRODUCTS AND FABRICATIONS

3. The top surface of all panels shall have a non-skid grit affixed to the surface by an epoxy resin followed by a baked-on top coat of epoxy resin.
4. Surface should have a Wear Index of less than 1.0 when tested to ASTM D4060 (Before and after 750 hours of UV exposure per ASTM D4329 cycle A).
5. Panels shall be fabricated to the sizes shown on the drawings.
6. Color shall be gray.
7. All bearing bars that are to be exposed to UV shall be coated with polyurethane coating to provide additional UV protection.

C. Products

1. The Pultruded FRP grating shall be fabricated from bearing bars and cross rods manufactured by the pultrusion process. The glass fiber reinforcement for the bearing bars shall be a core of continuous glass strand rovings wrapped with continuous strand glass mat. With the exception of grating and stair treads manufactured using phenolic resin, a synthetic surface veil fabric shall encase the glass reinforcement.
2. Fiberglass Grating
 - a. Fiberglass grating shall be made from a chemical resistant, fire retardant polyester resin system to meet the flame spread rating of 25 or less in accordance with ASTM E-84 testing, the flammability characteristics of UL 94 V0 and satisfies the self-extinguishing requirements of ASTM D-635. UV inhibitors are added to the resin to reduce UV attack.
3. Grating with SAFPLATE®
 - a. Grating shall be the same as described above in this section.
 - b. SAFPLATE® shall be made from EXTREN® as manufactured by Strongwell.
 - c. SAFPLATE® shall be manufactured using a premium polyester, vinyl ester or phenolic resin with fire retardant additive to meet Class 1 flame spread rating of 25 or less as tested by ASTM E-84 and meet the self-extinguishing requirements of ASTM D-635. All plate shall contain a UV inhibitor.
 - d. SAFPLATE® shall be epoxy bonded to the grating, and a non-skid grit shall be affixed to the top surface of the assembly.
4. If required, all cut and machined edges, holes and abrasions shall be sealed with a resin or compatible coating with the resin matrix used in the bearing bars and cross rods.
5. All panels shall be fabricated to the sizes shown on the approved shop drawings.

2.03 FRP LADDERS

A. Manufacturers

1. Ultra Fiberglass Systems INC. Milwaukee, WI. (414) 461-5051 or www.ultrafiberglass.com.
2. Strongwell 400 Commonwealth Ave. Brostol VA (276) 645-8000 or www.strongwell.com.
3. Or approved equal.

SECTION 066000 - FIBERGLASS REINFORCED POLYMER (FRP)
PRODUCTS AND FABRICATIONS

- B. Structural profiles will be manufactured with a premium grade polyester or vinyl ester resin with fire retardant additive to meet Class I flame rating of ASTM E84 and the self-extinguishing requirement of ASTM D635. All structural profiles will contain a UV inhibitor.
- C. Structural fiber reinforced polymer composites member composition will consist of a glass fiber reinforced polyester or vinyl ester matrix, approximately 50% resin-to-glass ratio. A synthetic surface veil will be the outermost layer of the exterior surfaces. Continuous glass strand roving will be internally used for transverse strength.
- D. Products:
 - 1. Ladder shall be fabricated using pultruded fiberglass reinforced polymer plastic pultruded profiles. 1 3/4" x 1 3/4" x 1/4" square tube safety yellow will be used to manufacture the ladder side rails. Round tube, safety yellow 1 1/4" x 1/8" will be used to manufacture the ladder rungs (Fluted). Side rails will be drilled so that the rung can be press fitted into the sidewalls of the square tube. The mechanical connections will be made with (4) 3/16" diameter 316 stainless steel rivets in each rung
 - 2. Cages also shall be fabricated using pultruded fiberglass reinforced polymer plastic pultruded profiles. Cage hoops will be fabricated using 1/8" flat strip. Hoops will be spaced every 48" O/C at max. Vertical support will be fabricated using 2' x 9/16" x 1/8" channel. All mechanical connections will be made with 18-8 stainless steel bolts, Nylon insert lock nuts, and washers.
 - 3. Standard mounting brackets will be fabricated using 8" x 3/8" Stainless Steel Channel, and 6" x 3/8" Channel attached to the ladder rail every 48" max.
 - 4. Rigid Rail Climbing Systems shall consist of 316 stainless steel square climbing rail with all mounting hardware and climbing trolley included from a single manufacturer.

PART 3 - EXECUTION

3.01 PREPARATION:

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction.
- B. Coordinate delivery of such items to project site.

3.02 INSTALLATION, GENERAL:

- A. Fastening to in-place construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous FRP fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts and other connectors as determined by the Design Engineer.

SECTION 066000 - FIBERGLASS REINFORCED POLYMER (FRP)
PRODUCTS AND FABRICATIONS

- B. Cutting, fitting and placement: Perform cutting, drilling and fitting required for installation of miscellaneous FRP fabrications. Set FRP fabrication accurately in location, alignment and elevation; with edges and surfaces level, plumb, true and free of rack; measured from established lines and levels.
- C. Provide temporary bracing or anchors in form work for items that are to be built into concrete masonry or similar construction.
- D. Penetrations through grating may require additional supports in order to meet design criteria. The Design Engineer shall follow manufacturer recommendations for each occurrence.

3.03 ALL FRP INSTALLATION:

- A. All field cut and drilled edges, holes and abrasions shall be sealed with a catalyzed resin compatible with the original resin as recommended by the manufacturer.
- B. Install items specified as indicated and in accordance with manufacturer instructions.
- C. All components shall be installed plumb and level, accurately fitted, free from distortion or defects.

3.04 INSPECTION AND TESTING:

- A. The Design Engineer shall have the right to inspect and test all materials to be furnished under these specifications prior to their shipment from the point of manufacture.
- B. All labor, power, materials, equipment and appurtenances required for testing shall be furnished by the Contractor at no cost to the Owner.

END OF SECTION

DIVISION 7

THERMAL AND MOISTURE PROTECTION

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

1.01 SUMMARY

A. Section Includes:

1. Self adhered vapor retarder.
2. Tapered insulation and overlayment board.
3. Base flashings.
4. Cant strips.
5. Sheet membrane roofing.

B. Related Requirements:

1. Section 061000 - Rough Carpentry.
2. Section 076200 - Sheet Metal Flashing and Trim: Counterflashing and Coping.

1.02 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
2. ASTM C1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
3. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
4. ASTM C1371 - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
5. ASTM C1549 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
6. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
7. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
8. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
9. ASTM D822 - Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
10. ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
11. ASTM D4637 - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane.
12. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
13. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
14. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

15. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
16. ASTM E408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
17. ASTM E903 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
18. ASTM E1918 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
19. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

B. FM Global:

1. FM DS 1-28 - Wind Design.
2. FM 4450 - Approval Standard for Class 1 Insulated Steel Deck Roofs.

C. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

D. National Roofing Contractors Association:

1. NRCA - The NRCA Roofing and Waterproofing Manual.

E. Single Ply Roofing Institute:

1. SPRI ES-1 - Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems.

F. UL:

1. UL - Fire Resistance Directory.
2. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
3. UL 1256 - Fire Test of Roof Deck Constructions.
4. UL 1897 - Uplift Tests for Roof Covering Systems.

1.03 COORDINATION

- A. Coordinate Work of this Section with installation of associated roof penetrations and metal flashings.

1.04 PREINSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing Work of this Section.
- B. Review preparation and installation procedures and coordinating and scheduling of related Work.

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

1.05 SUBMITTALS

- A. Product Data: Submit characteristics of membrane materials, adhesives, seaming materials, flashing materials, insulation, and vapor retarders.
- B. Shop Drawings:
 - 1. Indicate setting plan for tapered insulation, joint and termination detail conditions, and conditions of interface with other materials.
- C. Manufacturer's Certificate:
 - 1. Certify that products meet or exceed specified requirements.
- D. Field Quality-Control Submittals:
 - 1. Indicate results of Contractor-furnished tests and inspections.
- E. Manufacturer Reports:
 - 1. Manufacturer to perform site visits to verify preparation and installation meets manufacturer's requirements for warranty.
- F. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and applicator.

1.06 QUALITY ASSURANCE

- A. Roof Assembly Fire Classification:
 - 1. Minimum Class A when tested according to UL 790.
- B. Surface Burning Characteristics:
 - 2. Foam Insulation: Maximum 75/450 flame-spread/smoke-developed index when tested according to ASTM E84.
- C. Apply label from agency approved by authority having jurisdiction to identify each roof assembly component.
- D. Manufacturer's Inspection:
 - 3. Furnish manufacturer services before start of Work of this Section to verify substrate acceptability and review installation procedures and completed Work, such that specified warranty can be issued.
 - 4. Promptly and satisfactorily repair unsatisfactory conditions disclosed by manufacturer's Site visits.

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum ten years' documented experience.
- B. Applicator: Company specializing in performing Work of this Section with minimum five years' documented experience and approved by manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Deliver products in manufacturer's original containers, dry, undamaged, and with seals and labels intact.
- C. Store products in weather protected environment, clear of ground and moisture.
- D. Protect materials, except membrane, from direct exposure to sunlight, between 60 and 80 degrees F.
- E. Store solvent containing materials in well ventilated areas with proper fire and safety precautions.

1.09 AMBIENT CONDITIONS

- A. Do not apply roofing membrane during inclement weather or ambient temperatures below 60 degrees F or above 80 degrees F without proper weather protection.
- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.10 WARRANTY

- A. Furnish 20-year manufacturer's warranty, including coverage of both labor and material with no dollar limitation, including 90 MPH uplift warranty and 16 hours of puncture repair per year.

PART 2 - PRODUCTS

2.01 DESCRIPTION

- A. Sheet Membrane Roofing System: One-ply sheet membrane system with vapor retarder, insulation, overlayment board, and adhesive-applied membrane.

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

2.02 SINGLE PLY ROOFING - FULLY ADHERED

A. Manufacturer List:

1. Carlisle Syntec.
2. Firestone.
3. Tremco.
4. Or approved equal.

B. Sheet Vapor Retarder:

1. Self-adhering air and vapor barrier, 40 mil composite:
2. Comply with UL requirements.
3. Materials: 32 mil rubberized self-adhering asphalt laminated to 8 mil polyester fabric.
4. Primer: Single component water-based primer designed for use with approved vapor retarder.

C. Gypsum Sheathing:

1. Fiberglass mat-faced, noncombustible gypsum core panel.
2. Tested in accordance with ASTM E136.
3. Thickness: ½ inch.

D. Insulation:

1. Cellulose Fiber Board Facers Each Side.
2. Closed cell polyisocyanurate foam core.
3. Tapered 4' x 4' or 4' x 8' panels sloped at 1/8" per foot.
4. FM Class 1 and UL Class A rating.
5. ASTM C-1289, Type II, Class 1, Grade 3, 20 PSI minimum.

E. Flexible Flashings:

1. Material: EPDM.
2. Color: Black.

F. Membrane:

1. Material:
 - a. EPDM Rubber: Comply with ASTM D4637, Type I (non-reinforced), 0.60" thickness.

G. Lap Sealants: As recommended by membrane manufacturer.

H. Washer Disc: Membrane material with adhesive backing.

I. Adhesive Materials:

1. As recommended by manufacturer.

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and Site conditions are ready to receive Work.
- B. Verify that deck is supported and secure.
- C. Verify that deck is clean and smooth, free of depressions, waves, or projections, and suitable for installation of roof system.
- D. Verify that substrate is acceptable to membrane manufacturer.
- E. Verify that deck surfaces are dry and free of snow or ice.
- F. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents are solidly set and that wood nailing strips and reglets are in place.

3.02 PREPARATION

- A. Steel Deck:
 - 1. Verify that steel deck joints are flat and tight.
 - 2. Mechanically fasten sheathing to roof deck according to FM.

3.03 APPLICATION

- A. Vapor Retarder:
 - 1. Apply vapor retarder to sheathing surface with adhesive.
 - 2. Extend vapor retarder under blocking to deck edge.
- B. Insulation Application:
 - 1. Ensure that vapor retarder is clean and dry.
 - 2. Mechanically fasten insulation to deck.
 - 3. Place second layer of insulation with joints staggered 6 inches from joints of first layer.
 - 4. Place tapered thickness insulation to required slope pattern.
 - 5. Minimum Total Insulation Thickness: As required to achieve insulation R-value of 38.
 - 6. Lay boards with edges in moderate contact without forcing.
 - 7. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
 - 8. Lay tapered boards for distance of 18 inches back from roof drains for positive drainage.
 - 9. Apply no more insulation than can be covered with membrane in same day.
- C. Membrane Application:
 - 1. Apply primer.
 - 2. Install according to manufacturer's printed instructions.
 - 3. Apply adhesive at rate of 1 gal per 250 square feet.

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

4. Roll out membrane, free from air pockets, wrinkles, or tears, and firmly press sheet into place without stretching.
 5. Bond sheet to substrate..
 6. Sealing:
 - a. Overlap edges and ends and seal by contact tape, minimum 6 inches.
 - b. Seal to make membrane permanently waterproof.
 - c. Apply uniform bead of sealant to joint edge.
 7. Shingle joints on sloped substrate in direction of drainage.
 8. Extend membrane up a minimum of 8 inches onto vertical surfaces.
 9. Seal membrane around roof penetrations.
- D. Flashings and Accessories:
1. Apply flexible flashings to seal membrane to vertical elements.
 2. Secure to nailing strips at 8 inches o.c. and reglets.
 3. Coordinate installation of roof drains and related flashings.
 4. Seal flashings and flanges of items penetrating membrane.
 5. Pads:
 - a. Install walkway pads.
 - b. Space pad joints to permit drainage.

3.04 CLEANING

- A. Where finished surfaces are soiled by Work of this Section, consult surfaces manufacturer for cleaning advice and conform to manufacturer's documented instructions.
- B. Repair or replace defaced or disfigured finishes caused by Work of this Section.

3.05 PROTECTION

- A. Protect building surfaces against damage from roofing Work.
- B. Do not permit traffic over unprotected floor surfaces.

END OF SECTION

SECTION 075403 - SHEET MEMBRANE ROOFING - FULLY ADHERED

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SECTION 076200 - SHEET METAL FLASHING AND TRIM

1.01 SUMMARY

A. Section Includes:

1. Copings and counterflashings.

B. Related Requirements:

1. Section 061000 - Rough Carpentry.
2. Section 079000 - Joint Protection: Sealants and sealers.

1.02 REFERENCE STANDARDS

A. Aluminum Association:

1. AA - Designation System for Aluminum Finishes.

B. American Architectural Manufacturers Association:

1. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
2. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

C. ASTM International:

1. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

D. National Roofing Contractors Association:

1. NRCA - Construction Details Manual.

E. Sheet Metal and Air Conditioning Contractors' National Association:

1. SMACNA - Architectural Sheet Metal Manual.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer information regarding components metal types, finishes, and characteristics.

B. Fabricator's Certificate: Certify that products meet or exceed specified requirements.

SECTION 076200 - SHEET METAL FLASHING AND TRIM

C. Qualifications Statements:

1. Submit qualifications for fabricator and installer.

1.04 QUALITY ASSURANCE

- A. Perform Work according to SMACNA standards.

1.05 QUALIFICATIONS

- A. Fabricator: Company specializing in fabricating products specified in this Section with minimum five years' experience.
- B. Installer: Company specializing in performing Work of this Section with minimum five years' experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Storage:
 1. Store materials according to manufacturer instructions.
 2. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation.
 3. Slope metal sheets to ensure drainage.
- C. Protection:
 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 2. Prevent contact with materials that may cause discoloration or staining.
 3. Provide additional protection according to manufacturer instructions.

PART 2 - PRODUCTS

2.01 SHEET METAL FLASHING AND TRIM

A. Performance and Design Criteria:

1. Sheet Metal Flashings: Comply with following criteria of SMACNA Manual.

SECTION 076200 - SHEET METAL FLASHING AND TRIM

2.02 MATERIALS

A. Prefinished Aluminum Sheet:

1. Description: Alloy and temper as required for application and finish.
2. Comply with ASTM B209.
3. Thickness:
 - a. 0.032 inch 0.040 inch for coping.
4. Coating:
 - a. Shop precoated with Kynar.
 - b. Color: As selected by Owner from manufacturer's standard.

2.03 FABRICATION

- A. Form section shapes as indicated on Drawings, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet metal, interlocking with sheet.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch.
- E. Miter and seam corners.
- F. Forming:
 1. Form material with seams in accordance with SMACNA standards, except where otherwise indicated.
 2. At moving joints, use sealed, lapped, bayonet-type, or interlocking hooked seams.
- G. Corners:
 1. Fabricate corners from one piece with minimum 18-inch long legs.
 2. Seam for rigidity and seal with sealant.
- H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- I. Flashings:
 1. Fabricate flashings to allow toe to extend 2 inches over roofing.
 2. Return and brake edges.
- J. Fabricate accessories in profile and size to suit gutters and downspouts, as follows:
 1. Anchorage Devices: Comply with SMACNA requirements.
- K. Seal metal joints.

SECTION 076200 - SHEET METAL FLASHING AND TRIM

2.04 FINISHES

- A. Coating:
 - 1. Material: Kynar.
- B. Washcoat: Finish concealed side of metal sheets with washcoat compatible with finish system, as recommended by finish system manufacturer.

2.05 ACCESSORIES

- A. Fasteners: Corrosion resistant fasteners as recommended by manufacturer.
- B. Sealant:
 - 1. Type: Silicone.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets are in place, and nailing strips have been located.
- B. Verify that roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter strips, edge strips, and cleats before starting installation of sheet metal flashing and trim.

3.03 INSTALLATION

- A. Recessed Flashing Reglets:
 - 1. Insert counterflashings into existing reglets to form tight fit.
 - 2. Secure in place with wedges.
 - 3. Seal flashings into reglets with sealant.
 - 4. Fit flashings tight in place, and make corners square, surfaces true and straight in planes, and lines accurate to profiles.
 - 5. Seal metal joints watertight.
- B. Copings:
 - 1. Install concealed cleat fastened to wood blocking at the exterior side of the parapet wall.
 - 2. Clip coping into concealed cleat and fasten with gasketed fastener at interior side of parapet wall.

SECTION 076200 - SHEET METAL FLASHING AND TRIM

3. Fit copings in place, and make corners square, surfaces true and straight in planes, and lines accurate to profiles.
4. Seal metal joints watertight.

END OF SECTION

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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SECTION 077233 - ROOF HATCHES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Prefabricated double-leaf roof hatches, with operable hardware, counterflashings, and support curbs.

B. Related Sections:

1. Section 075403 – Sheet Membrane Roofing.

1.02 SUBMITTALS

- ##### A. Product Data:
- Submit manufacturer information regarding unit construction, sizes, configuration, jointing methods, locations if applicable, and attachment method in accordance with Section 013300 – Submittal Procedures.

- ##### B. Manufacturer's Certificate:
- Products meet or exceed specified requirements.

- ##### C. Manufacturer Instructions:
- Special installation criteria and interface with adjacent components.

D. Qualifications Statement:

1. Submit qualifications for manufacturer. Company specializing in manufacturing and installation of components specified in this Section with minimum of 5 years documented experience.
2. Single Source Responsibility: Obtain roof hatch units and frames for entire Project from one source and a single manufacturer.

1.03 QUALITY ASSURANCE

- ##### A. Perform Work in accordance with State and Local Standards.

- ##### B. Manufacturer:
- Company specializing in manufacturing products specified in this Section with minimum five years' experience. All roof hatch components shall be obtained from a single manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- ##### A. Store materials according to manufacturer instructions and inspect for damage.

SECTION 077233 - ROOF HATCHES

B. Protection:

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

1.05 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

1.06 WARRANTY

- #### A. Furnish five-year manufacturer's standard warranty for roof hatches.

PART 2 - PRODUCTS

2.01 ROOF HATCHES

A. Manufacturers:

1. Babcock-Davis.
2. Bilco Company.
3. Nystrom.
4. Substitutions: Not permitted.

B. Description:

1. Material: Aluminum.
2. Type: Double leaf.
3. Integral Curb:
 - a. Nominally 12 inches high.
 - b. Double wall with 1-inch rigid fiberboard insulation.

C. Performance and Design Criteria:

1. Live Load: As calculated according to applicable code.

D. Cover and liner: 11 gauge (0.090-inch) aluminum cover with 1-inch rigid fiberboard insulation and 18 gauge (0.040-inch) aluminum cover liner. Provide interior padlock hasp and EPDM seal.

E. Hardware:

1. Operator: Heavy duty compression spring.

SECTION 077233 - ROOF HATCHES

2. Pull for Interior and Exterior Operations:
 - a. Description: Manual pull handle.
 - b. Material: Stainless Steel.
3. Hold-Open Arm: Stainless Steel, with vinyl-covered grip handle.
4. Latch: Stainless Steel with turn handle.
5. Hinges: Stainless Steel.
6. Finish: Mill finish.

F. Integral Curb:

1. Material: 11 gauge aluminum.
2. Double wall.
3. Insulation: Nominal 1-inch rigid fiberboard.
4. Integral cap flashing to receive roof flashing.
5. Extended flange for mounting.

2.02 FABRICATION

- A. Fabricate components free of defects and visual distortion.
- B. Weld corners and joints.
- C. Condensation Protection: Drain to exterior above roofing.
- D. Fit components for weathertight assembly.
- E. Sloped Roofs: Taper roof hatch curbs to maintain hatch top level.

2.03 ACCESSORIES

- A. Anchorage Devices: As recommended by manufacturer.
- B. Counterflashings: Same metal type and finish as roof hatch frame.
- C. Sealant:
 1. As recommended by roof hatch manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that openings and substrate conditions are ready to receive Work of this Section.

SECTION 077233 - ROOF HATCHES

3.02 PREPARATION

- A. Apply protective coating on aluminum surfaces of roof hatches in contact with cementitious materials or dissimilar metals.

3.03 INSTALLATION

- A. According to manufacturer instructions.
- B. Install curb assembly, fastening securely to roof decking.
- C. Flash curb assembly into roof system.
- D. Roof Hatch:
 - 1. Place and secure to curb assembly.
 - 2. Install integral setting sealant and counterflashing as required.
- E. Coordinate with installation of roofing system and related flashings for weathertight installation.
- F. Adjust and lubricate cover for ease of operation and watertightness.

3.04 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.
- B. Adjust hinges for smooth operation.

3.05 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Wash exposed surfaces and wipe clean.
- C. Remove excess sealant.

END OF SECTION

SECTION 079000 - JOINT PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Sealants and joint backing.
2. Accessories.

1.02 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C 661 - Standard Test Method for Indentation Hardness of Elastomeric Type Sealants by Means of a Durometer.
2. ASTM C 719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants under Cyclic Movement (Hockman Cycle).
3. ASTM C 920 - Specification for Elastomeric Joint Sealants.
4. ASTM C 1135 - Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants.
5. ASTM C 1184 - Standard Specification for Structural Silicone Sealants.
6. ASTM C 1193 - Standard Guide for Use of Joint Sealants.
7. ASTM C 1248 - Test Method for Staining of Porous Substrate by Joint Sealants.
8. ASTM C 1330 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
9. ASTM D 2240 - Standard Test Method for Rubber Property - Durometer Hardness.
10. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.

B. Sealant, Waterproofing, and Restoration Institute (SWRI): www.swrionline.org:

1. SWRI Validation Program.

1.03 SUBMITTALS

A. Product Data: For each type of joint sealant product specified, including:

1. Preparation instructions and recommendations.
2. Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.

B. Joint Sealant Schedule: Indicate joint sealant location, joint sealant type, manufacturer and product name, and color, for each application. Utilize joint sealant designations included in this Section.

C. Samples for Color Selection: For each joint sealant type.

D. Samples for Verification: For each exterior joint sealant product, for each color selected.

SECTION 079000 - JOINT PROTECTION

E. INFORMATIONAL SUBMITTALS

1. Qualification Data: For qualified applicator.
2. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
3. Preconstruction compatibility and adhesion test reports.
4. Preconstruction field-adhesion test reports.
5. Field quality control adhesion test reports.
6. Warranty: Sample of unexecuted manufacturer and installer special warranties.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced Installer equipped and trained for application of joint sealants required for this Project with record of successful completion of projects of similar scope.
- B. Single Source Responsibility: Provide exterior joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.
- C. Preconstruction Field-Adhesion Testing: Prior to installing joint sealants, field test adhesion to joint substrates using ASTM C 1193 Method A or method recommended by manufacturer. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written report to Architect.
- D. Mockups: Provide joint sealant application within mockups required in other sections identical to specified joint sealants and installation methods.
 1. Warranty Period for Silicone Sealants: 20 years date of Substantial Completion.

1.05 MOCKUPS

- A. Construct mockup of sealant joints at each location using up to three colors selected from the samples.
- B. Construct mockup with specified sealant types and with other components as indicated.
- C. Preparation and Priming:
 1. Determine requirements based on manufacturer recommendations.
 2. Correct failure of sealant tests on mockup if required.
- D. Verify that sealants, primers, and other components do not stain adjacent materials.
- E. Locate mock-up at an easily accessible area that can be seen from the ground.
- F. Incorporate accepted mockup as part of Work. Remove mock-ups that were not accepted.

SECTION 079000 - JOINT PROTECTION

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store products according to manufacturer instructions.
- C. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.07 FIELD CONDITIONS

- A. Hazardous Materials: No hazardous materials are known to be present on site.
 - 1. If suspected hazardous materials are encountered, do not disturb materials, and immediately notify Architect and Owner.
- B. Maintain temperature and humidity as recommended by sealant manufacturer during and after installation.

1.08 WARRANTY

- A. Special Installer's Warranty: Original statement on Installer's letterhead in which Installer agrees to repair or replace joint sealants that demonstrate deterioration or failure within warranty period specified.
 - 1. Warranty Period: Two years from date of Substantial Completion.
 - 2. Include coverage for:
 - a. Installed sealants and accessories failing to achieve watertight seal.
 - b. Installed sealants and accessories exhibiting loss of adhesion or cohesion.
 - c. Sealants that do not cure.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that demonstrate deterioration or failure under normal use within warranty period specified.

SECTION 079000 - JOINT PROTECTION

PART 2 - PRODUCTS

2.01 JOINT SEALERS

A. Manufacturers:

1. Dow Corning Corporation
 - a. 2200 W. Salzburg Street P.O. Box 994 Midland MI 48686-0994
 - b. Phone: (800) 248-2481
2. Sika Corporation
 - a. 201 Polito Avenue Lyndhurst NJ 07071
 - b. Phone: 800-933-8800
3. Tremco Incorporated
 - a. 3735 Green Road Beachwood OH 44122
 - b. Phone: 800.321.7906
4. GE Construction Sealants
 - a. 9930 Kincey Ave Huntersville NC 28078
 - b. Phone: 877-943-7325

2.02 JOINT SEALERS BY APPLICATION

A. High-Performance General-Purpose Exterior (Nontraffic) Sealant:

1. Material: Silicone
2. Comply with ASTM C920, Grade NS, Class 25, Uses M, G, and A.
3. Type: Single component.
4. Color: As selected.
5. Applications:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between metal frames and other materials.
 - c. Other exterior nontraffic joints for which no other sealant is indicated.

2.03 ACCESSORIES

A. Primer:

1. Type: Non-staining.
2. As recommended by sealant manufacturer to suit application.

SECTION 079000 - JOINT PROTECTION

B. Joint Cleaner:

1. Type: Non-corrosive and non-staining.
2. As recommended by sealant manufacturer.
3. Compatible with joint forming materials.

C. Joint Backing:

1. Description: Round foam rod, compatible with sealant.
2. Comply with ASTM D1667.
3. Size: Oversized 30 to 50 percent larger than joint width.

D. Bond Breaker:

1. Description: Pressure-sensitive tape.
2. As recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces and joint openings are ready to receive Work of this Section.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Comply with ASTM C1193.
- B. Remove loose materials and foreign matter that could impair adhesion of sealant.
- C. Clean and prime joints.
- D. Protect elements surrounding Work of this Section from damage or disfiguration.

3.03 APPLICATION

- A. Comply with ASTM C1193.
- B. Measure joint dimensions and size joint backers to achieve following:
 1. Width to Depth Ratio: 2:1.
 2. Neck Dimension: No greater than 1/2 of joint width.
 3. Surface Bond Area on Each Side: Not less than 75 percent of joint width.
- C. Install bond breaker where joint backing is not used.
- D. Apply sealant free of air pockets, foreign embedded matter, ridges, and sags.

SECTION 079000 - JOINT PROTECTION

E. Joint Tooling: Concave.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

END OF SECTION 079000

DIVISION 8

OPENINGS

SECTION 081110 – METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel doors and frames; fire rated steel doors and frames.
- B. Related Requirements:
- C. Section 087100 – Door Hardware

1.2 SUBMITTALS

- A. Shop Drawings: Indicate door and frame elevations, internal reinforcement, cut-outs for glazing, louvers, and finishes.
- B. Product Data: Submit door and frame configurations, location of cut-outs for hardware reinforcement.
- C. Samples: Submit two samples of metal, door frame and door face, 2x2 inch in size illustrating shop finish colors and surface texture.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with the following:
 - ANSI 250.8 - Recommended Specifications for Standard Steel Doors and Frames.
 - DHI - Door Hardware Institute - The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- B. Fire Rated Door Construction: Conform to NFPA 252.
- C. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.
- D. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.
- E. Surface Burning Characteristics:
 - Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- F. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation material.
- G. Perform Work in accordance with NY State Building Codes.

PART 2 - PRODUCTS

2.1 STEEL DOORS AND FRAMES

- A. Manufacturers:

SECTION 081110 – METAL DOORS AND FRAMES

1. Amweld Building Products, Inc.
2. Pioneer Industries
3. Ceco Door

- B. Product Description: Standard shop fabricated steel doors, and frames; fire rated and non-rated types; flush face or stile and design.

2.2 COMPONENTS

- A. Exterior Doors (Non-Rated): ANSI A250.8, 1-3/4 inch thick.
Level 2 - Heavy Duty, Model 1, seamless design.
- B. Interior Doors (Non-Rated): ANSI A250.8, 1-3/4 inch thick.
Level 2 - Heavy Duty, Model 1, seamless design.
- C. Exterior Frames.
Level 1 for Doors, nominal 16 gage thick material, base metal thickness.
- D. Interior Frames.
Level 1 for Doors, nominal 16 gage thick material, base metal thickness.
- E. Door Core: Insulated: polystyrene foam. Non-insulated: vertical steel stiffeners with fiberglass acoustic insulation.
- F. End Closure: Channel, flush.
- G. H. Thermal Insulated Door: Total insulation R-Value of 7, measured in accordance with ASTM C1363.
- H. I. Sound Rated Door: STC of 26, measured in accordance with ASTM E413.

2.3 HARDWARE AND ACCESSORIES

- A. General: Provide hardware that is manufactured for extra strength for use in institutional and high traffic applications, fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and secure doors, as follows:
Refer to Section 087100 – Door Hardware, in addition to the requirements listed in this section.
- B. Hardware furnished by other manufacturers to be installed on the doors shall be installed by either the door manufacturer or the door installer according to the hardware manufacturer's requirements.
- C. Weatherstripping:
Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.

The door weatherstripping on single acting doors (single or pairs) shall be bulb polymeric weatherstripping in door frames. This is comprised of a thermoplastic elastomer on a tubular shape with a semi-rigid polymeric backing.

SECTION 081110 – METAL DOORS AND FRAMES

- D. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners (Necessary to meet specified performance tests).
- E. Threshold: 1/2" by 4" Threshold: stainless steel ADA compliant with ribbed surface, anchored to floor with suitable fasteners.
- F. Astragals for Double Doors: Steel, Z or T shaped, specifically for double doors.
- G. Silencers: Resilient rubber fitted into drilled hole, three per frame.

2.4 FABRICATION

- A. Fabricate doors and frames with hardware reinforcement welded in place. Protect frame hardware preparations with mortar guard boxes.
- B. Attach astragal to inactive leaf of pairs of fire rated doors.
- C. Fabricate frames as knock down units for field assembly.
- D. Fabricate frames to suit masonry wall coursing with 4 inches head member.
- E. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- F. Prepare interior frames for silencers and install.
- G. Frame Mullions for Double Doors: Removable type, with profile matching jambs.
- H. Attach fire rating label to each fire rated door and frame.

2.5 SHOP FINISHING

- A. Steel Sheet: Galvanized to ASTM A653/A653M G90 coating class.
- B. Primer: Baked.
- C. Shop Finish: Baked enamel.
- D. Coat inside of frame profile with bituminous coating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install doors and frames in accordance with ANSI A250.8.
- B. Coordinate door frames with wall construction for frame anchor placement.

SECTION 081110 – METAL DOORS AND FRAMES

- C. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.
- D. Install door louvers plumb and level.
- E. Coordinate installation of glass and glazing specified in Section 088000.
- F. Adjust door for smooth and balanced door movement.
- G. Tolerances:
Maximum Diagonal Distortion: 1/16 measured with straight edge, corner to corner.

END OF SECTION

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes overhead coiling door, operating hardware, electric operation.
 - 1. Provide wiring from electric circuit disconnect to door operator to control station.
- B. Related Sections:
 - 1. Section 099000 - Painting and Coating

1.02 REFERENCES

- A. ASTM International:
 - 1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 3. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings.
- C. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
 - 3. NEMA MG 1 - Motors and Generators.
- D. Underwriters Laboratories Inc.:
 - 1. UL - Building Materials Directory.
 - 2. UL 10B - Fire Tests of Door Assemblies.
 - 3. UL 325 - Door, Drapery, Gate, Louver, and Window Operators and Systems.

1.03 SYSTEM DESCRIPTION

- A. Electric Operation: Electric motor operated unit with manual override in case of power failure.

SECTION 083323 - OVERHEAD COILING DOORS

1.04 DESIGN REQUIREMENTS

- A. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf, with maximum deflection of 1/120, and without damage to door or assembly components.
- B. Operation: Design door assembly including operator, to operate for not less than 20,000 cycles and 10 cycles per day.

1.05 SUBMITTALS

- A. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- B. Product Data: Submit general construction, component connections and details, wiring diagram and electrical equipment.
- C. Samples: Submit samples of door slat material, in manufacturer's standard size, illustrating shape, color and finish texture.
- D. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, and adjustment and alignment procedures.

1.06 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.07 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by UL or another testing firm acceptable to authority having jurisdiction.
- B. Surface Burning Characteristics:
 - 1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.
- D. Perform Work in accordance with New York State Building Code – latest revision standard.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five (5) years documented experience.

SECTION 083323 - OVERHEAD COILING DOORS

- B. Installer: Company specializing in performing work of this section with minimum five (5) years documented experience approved by manufacturer.

PART 2 - PRODUCTS

2.01 OVERHEAD COILING DOORS

- A. Manufacturers:
 - 1. McKeon Rolling Steel Door Company, Inc.
 - 2. Overhead Door Corporation.
 - 3. Wayne-Dalton Corp.
- B. Furnish materials in accordance with New York State and local standards.
 - 1. Electric Operation: Electric motor operated unit with manual override in case of power failure.

2.02 COMPONENTS

- A. Curtain: Conform to following:
 - 1. Steel Slats: Interlocking, minimum 24 gage of ASTM A653/A653M steel, minimum galvanized coating designation G90 coating class.
 - a. Type: Sandwich slat construction with insulated core filled with CFC-free foamed in place polyurethane.
 - 1) R-value: 7.7.
 - 2) Sound Rating: STC-21.
 - 2. Nominal Slat Size: 2 inches wide by required length.
 - 3. Slat Ends: Each slat fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
 - 4. Curtain Bottom: Fitted with angles, channels, or tubes to provide reinforcement and positive contact with floor in closed position.
- B. Guides: Minimum 3/16 inch; galvanized steel conforming to ASTM A653/A653M, minimum galvanized coating designation G90 coating class.
 - 1. Furnish continuous angles of profile to retain door in place with snap-on trim; mounting brackets of same metal.
- C. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension.
- D. Steel pipe barrel houses springs, and supports curtain with a maximum deflection of 0.03" per foot of opening width.

SECTION 083323 - OVERHEAD COILING DOORS

- E. Ball bearings at rotating support points.
- F. Spring adjusting wheel accessible.
- G. Hood Enclosure and Fascia: Round shape, minimum 24 gage galvanized steel; internally reinforced to maintain rigidity and shape.
- H. Hardware:
 - 1. Handle: Inside side mounted, adjustable keeper, spring activated latch bar with feature to keep in locked or retracted position; interior handle.
 - 2. Weatherstripping (Exterior Assemblies): Moisture and rot proof, resilient type for complete weathertight installation.
 - 3. Perimeter gaskets and closures to prevent spread of smoke through door assembly and to maintain required fire rating and fire label.
- I. Electric Operator:
 - 1. Description: UL 325, side mounted and hood mounted, open drip-proof motor.
 - 2. Motor Enclosure: NEMA MG1 Type 1 enclosure.
 - 3. Motor Rating: continuous duty.
 - 4. Motor Voltage: 208 volt, three phase, 60 Hz.
 - 5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
 - 6. Controller Enclosure: NEMA 250 Type 1.
 - 7. Door Speed: 12 inches per second.
 - 8. Brake: Adjustable friction clutch type, activated by motor controller.
 - 9. Inside motor operated. Motor operator is to include high starting torque motor, reduction gearing, solenoid brake, limit switches for upper and lower limits of door travel, emergency hand chain with electrical interlock to break motor circuit when hand chain is engaged, magnetic relay contactor, overload protection, prewiring to terminal block and 3 button operating station. Motor is to be removable for repair without affecting emergency operation. Manufacturer is to furnish wiring diagram. Field wiring is not included in this section.
The motors, controls and protection devices shall be suitable for the environment in which they are located.
- J. Control Station: Standard three button (Open-Stop-Close) momentary control for each operator; 24 volt circuit; surface mounted.
- K. Safety Edge: Manufacturer's standard safety edge and weatherseal located at door bottom, full width, sensitized type, wired to stop upon striking object.

2.03 SHOP FINISHING

- A. Curtain Slats: Steel, galvanized.
- B. Steel Guides and Hood Enclosure: Shop prime and finish paint.

SECTION 083323 - OVERHEAD COILING DOORS

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

- A. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- B. Securely and rigidly brace components suspended from structure.
- C. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- D. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 079000.
- E. Install perimeter trim and closures.

3.03 ERECTION TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent Work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft. straight edge.

3.04 ADJUSTING

- A. Adjust door, hardware and operating assemblies for smooth and noiseless operation.
- B. Test smoke activated assemblies for proper activation.

3.05 CLEANING

- A. Clean door and components.
- B. Remove labels and visible markings.

END OF SECTION

SECTION 083323 - OVERHEAD COILING DOORS

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SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes extra strength aluminum-framed storefronts for applications such as institutions and other high traffic applications, including aluminum and glass doors, frames, hardware, glass, and window units.

1.02 SYSTEM DESCRIPTION

- A. Aluminum-Framed Storefront System: Tubular aluminum sections with supplementary internal support framing, factory fabricated, factory finished, insulated glass, related flashings, anchorage and attachment devices.
- B. System Assembly: Factory unitized assembly.
- C. System Design: Provide for expansion and contraction within system components caused by temperature cycling. Design and size members to withstand loads caused by pressure and suction of wind.
- D. Wind-Borne Debris Loads: Design and size glass to withstand the following loads:
 - 1. Glass Within 30 feet of Grade: ASTM E1886 and ASTM E1996; large missile impact test.
 - 2. Glass Greater than 30 feet above Grade: ASTM E1886 and ASTM E1996; small missile impact test.
- E. Air Infiltration: Limit air leakage through assembly to 0.06 cfm/min/sq ft of wall area, measured at reference differential pressure across assembly of 1.57 psf when tested in accordance with ASTM E283.
- F. Water Leakage: None, when measured in accordance with ASTM E331 with test pressure difference of 20 percent of design pressure, with minimum differential of 2.86 lbf/sq ft and maximum of 12.00 lbf/sq ft.
- G. System Internal Drainage: Drain water entering framing system to exterior.

1.03 PERFORMANCE REQUIREMENTS

- A. Fire Rating Requirements: Capable of providing a fire rating for 45 minutes.

1.04 SUBMITTALS

- A. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

- B. Product Data: Submit component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with AAMA SFM-1 and AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Fire-Rated Assemblies:
 - 1. Door Assemblies: Comply with NFPA 80, listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 252.
 - 2. Window Assemblies: Comply with NFPA 252, listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 257 and ASTM E119.
- C. Door Hardware:
 - 1. Mortise locksets, latchsets and trim to conform with ANSI a156.2, Grade 1 specifications.
 - 2. Deadbolts and trim to conform with ANSI a156.5, Grade 1 specifications.
- D. Perform Work in accordance with New York State Building Code.
- E. Regulatory Requirements: Doors shall comply with Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG), ANSI A117.1 and NFPA 101 as follows:
 - 1. Handles, pulls, latches, locks, and other operating devices.
 - 2. Door closers: comply with applicable opening force requirements.
- F. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- G. Installer: Company specializing in performing Work of this section with minimum three years experience approved by manufacturer.
- H. Design wind loading under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of New York.

1.06 WARRANTY

- A. Furnish five year manufacturer warranty for insulated glass and factory finishes.

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. EFCO Corporation 1000 County Road Monett Mo 65708 (800) 221-4169, web site <http://www.efcocorp.com>
- B. Kawneer Company, Inc. 555 Guthridge Court Technology Park / Atlanta Norcross GA 30092 (770) 449-5555, web site <http://www.kawneer.com>
- C. Tubelite Inc. 3056 Walker Ridge Dr NW, Suite G Walker MI 49544 (800) 866-2227, web site <http://www.tubeliteinc.com>
- D. Substitutions: As approved by the Engineer.
- E. Basis-of-Design Product:
 - 1. The face dimensions of the door stile and top rail of the entrance door shall be 3 1/2" and the bottom rail shall be 6 1/2".
 - 2. Major portions of the door members to be 0.125" nominal thickness and glazing molding to be 0.05" thick.
 - 3. Glazing gaskets either EPDM elastomeric extrusions or a thermoplastic elastomer.
 - 4. Provide adjustable glass jacks to help center the glass in the door opening.

2.02 MATERIALS - GLASS

- A. Glazing: ASTM C 1036 and ASTM C 1048; composed of multiple sheets of clear tempered safety glass.
- B. Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
- C. Thickness of Glazing Material: 1"
- D. Approximate Visible Transmission: Range of 75 to 88 percent).
- E. Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacture, testing laboratory (UL), fire rating period, safety glazing standards, and date of manufacture.
- F. Glazing Accessories: Manufacturer's standard compression gaskets, standoff, spacers, setting blocks and other accessories necessary for a complete installation.

2.03 MATERIALS – ENTRANCE DOORS

- A. Aluminum Extrusions: Alloy and temper recommended by sliding aluminum-framed glass door manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.090" wall thickness at any location for the main frame and sash members.

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with sliding aluminum-framed glass door members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
 - 1. Weather Seals: Provide weather stripping with integral barrier fin or fins of semi-rigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702.

2.04 MATERIALS – STOREFRONT FRAMING SYSTEMS

- A. 4 1/2" deep thermally broken entrance framing with a 1/4" separation consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections .
- B. Non-Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.
- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- E. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- F. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

2.05 HARDWARE

- A. General: Provide manufacturer's standard hardware for extra strength entrance doors for institutional and high traffic applications, fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and secure aluminum-framed entrance doors, as follows:
1. Continuous hinge: stainless steel.
 2. Push Bar or Panic Bar.
 3. Push Button for automatic door operators.
 4. Pull Handle.
 5. Deadbolt lock.
 6. Lock faceplate.
 7. Adjustable astragal with pile weathering and polymeric fin at meeting stiles.
 8. Surface closer with back-check and adjustable hold-open.
 9. Automatic door operator: for entrances with wheelchair push buttons.
- B. Hardware furnished by other manufacturers to be installed on the doors shall be installed by either the door manufacturer or the door installer according to the hardware manufacturer's requirements.
- C. Weatherstripping:
1. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.
 2. The door weatherstripping on single acting doors (single or pairs) shall be bulb polymeric weatherstripping in door frames. This is comprised of a thermoplastic elastomer on a tubular shape with a semi-rigid polymeric backing.
- D. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners (Necessary to meet specified performance tests).
- E. Threshold: 1/2" by 4" Threshold: stainless steel ADA compliant with ribbed surface, anchored to floor with suitable fasteners.

2.06 FABRICATION

- A. Fabricate aluminum-framed glass entrance doors in sizes indicated. Include a complete system for assembling components and anchoring doors.
1. Fabricate aluminum-framed glass doors that can be re-glazed without dismantling perimeter framing.
 - a. Door corner construction shall consist of mechanical clip fastening, SIGMA deep penetration plug welds and 1-1/8" (29 mm) long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable cord.
 - b. Accurately fit and secure joints and corners. Make joints hairline in appearance.

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

- c. Prepare components with internal reinforcement for door hardware.
 - d. Arrange fasteners and attachments to conceal from view.
- B. Weather Stripping: Provide weather stripping locked into extruded grooves in door panels or frames as indicated on manufactures drawings and details.
- C. Obtain reviewed Shop Drawings prior to fabrication.

2.07 FINISHES, GENERAL

- A. Comply with AAMA-AFPA "Anodic Finishes/Painted Aluminum" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.08 ALUMINUM FINISHES

- A. Color-Coated Finish: Apply manufacturer's standard anodic finish system, applied to factory-assembled frames before shipping, complying with manufacturer's written instructions for surface preparation including pretreatment and application.
- 1. Color and Gloss: As selected by Owner from manufacturer's full range.
- B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

- 2.09 Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil thickness per coat.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates and members to which the work of this section attaches or adjoins prior to frame installation.
- B. Provide openings plumb, square and within allowable tolerances.
- 1. The manufacturer recommends 3/8 inch shim space at all walls

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

- C. Notify Architect of any conditions which jeopardize the integrity of the proposed door system.
- D. Do not proceed until such conditions are corrected.

3.02 INSTALLATION

- A. Follow manufacturer's written instructions and reviewed shop drawings.
- B. Install fully fire windows and doors in strict accordance with the approved shop drawings.
- C. Set continuous sill members and flashing in full sealant bed to produce a watertight installation.
- D. Install fire safing / fire stopping at edges of system
- E. Install glazing in strict accordance with fire resistant glazing material manufacturer's specifications. Field cutting or tampering is not permissible.
- F. Do not install damaged frames or chipped glassing units.
- G. Install plumb and true. Limit out of plumb or true to 1/8 inch in 10'-0" in any dimension.

3.03 REPAIR AND TOUCH UP

- A. Powder Coated Finishes
 - 1. Limited to minor repair of small scratches. Use only manufacturer's recommended products.
 - 2. Such repairs shall match original finish for quality or material and view.
 - 3. Repairs and touch-up not visible from a distance of 5 feet Owner and Architect to approve.
- B. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

3.04 FIELD QUALITY CONTROL

- A. Owner or [Contractor] will engage a qualified independent testing agency to perform field tests and inspections of entrance system.

3.05 ADJUSTING

- A. Adjust door function and hardware for smooth operation. Coordinate with other hardware suppliers for function and use of any other attached hardware.

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

3.06 PROTECTION AND CLEANING

- A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
 - 1. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
 - 2. Bullet resistant glazing materials employing PVB layer on exterior surface
 - 3. Protect surface applied film. Do not use any of the following:
 - a. Steam jets
 - b. Abrasives
 - c. Strong acidic or alkaline detergents, or surface-reactive agents
 - d. Detergents not recommended in writing by the manufacturer
 - e. Do not use any detergent above 77 degrees F
 - f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
 - g. Metal or hard parts of cleaning equipment must not touch the glass surface
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Hardware for metal doors, thresholds, weatherstripping, seals, and door gaskets.
- B. Related Requirements:
 - 1. Section 081110 – Metal Doors and Frames

1.02 PERFORMANCE REQUIREMENTS

- A. Fire Rated Openings: Provide door hardware listed by UL or Warnock Hersey, or other testing laboratory approved by applicable authorities.
 - 1. Hardware: Tested in accordance with NFPA 252.

1.03 SUBMITTALS

- A. Shop Drawings: Indicate locations and mounting heights of each type of hardware.
- B. Schedule: Submit a complete schedule of all hardware to be supplied.
- C. Product Data: Submit product data for each hardware item listed in the hardware schedule.

1.04 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with the following requirements:
 - 1. ANSI A156 series.
 - 2. NFPA 80 - Fire Doors and Windows.
 - 3. NFPA 101 - Life Safety Code.
- B. Furnish hardware marked and listed in BHMA Directory of Certified Products.
- C. Coordination: Coordinate work of this section with other directly affected sections requiring integral reinforcement for door hardware.

SECTION 087100 - DOOR HARDWARE

- D. Supplier: Company specializing in supplying commercial door hardware with minimum three years experience and approved by primary hardware manufacturers.
- E. Door hardware shall be fully compatible with the Owner's standard door access control system.

1.06 WARRANTY

- A. Furnish five year manufacturer warranty for door hardware.

1.07 MAINTENANCE SERVICE

- A. Provide service and maintenance services of door closers for one year from Date of Substantial Completion.
- B. Provide special wrenches and tools applicable to each different or special hardware component.

PART 2 - PRODUCTS

2.01 DOOR HARDWARE

- A. Manufacturers:
 - 1. Corbin Russwin, Inc.
 - 2. Hager Companies.
 - 3. SARGENT Manufacturing Company.
 - 4. Schlage; an Allegion brand.
 - 5. Stanley Commercial.
 - 6. Or approved equal.
- B. Hinge Manufacturers:
 - 1. Hager Companies.
 - 2. McKinney Products.
 - 3. Stanley Commercial.
 - 4. Or approved equal.
- C. Lockset and Cylinder Manufacturers:
 - 1. Corbin Russwin, Inc.
 - 2. Hager Companies.
 - 3. SARGENT Manufacturing Company.
 - 4. Or approved equal.

SECTION 087100 - DOOR HARDWARE

D. Closers Manufacturers:

1. Corbin Russwin, Inc.
2. Hager Companies.
3. SARGENT Manufacturing Company.
4. Or approved equal.

2.02 COMPONENTS

A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.

1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.

a. Finish: Match hardware item being fastened.

4. Electrical Devices: Make provisions and coordinate requirements for electrical devices and connections for hardware.

B. Hinges: ANSI A156.1, full mortise type ball bearing complying with following general requirements unless otherwise scheduled.

1. Widths: Sufficient to clear trim projection when door swings fully (120 degrees).
2. Number: Furnish minimum three hinges for each door leaf, four hinges over 80" high.

C. Locksets: Furnish locksets compatible with specified cylinders. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.

1. Bored (Cylindrical) Locksets: ANSI A156.2, Grade 1 unless otherwise indicated.
2. Deadbolt Locks: ANSI A156.5, Grade 1 unless otherwise indicated.

D. Exit Devices: ANSI A156.3, Grade 1 concealed vertical rod type, with cross bar. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt, with dust-proof floor strikes.

1. Types: Suitable for doors requiring exit devices.
2. Coordinators: Furnish overhead type at pairs of doors.

E. Cylinders: ANSI A156.5, Grade 1, interchangeable core type cylinders.

1. Keying: Key to Owner's existing keying system.

SECTION 087100 - DOOR HARDWARE

2. Supply keys in the following minimum quantities:
 - a. 3 change keys for each lock.
- F. Closers: ANSI A156.4, surface mounted overhead concealed closers; full rack and pinion type with steel spring and non-freezing hydraulic fluid; closers required for fire rated doors unless otherwise indicated.
 1. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
 2. Arms: Type to suit individual condition; parallel-arm closers at reverse bevel doors and where doors can swing full 180 degrees.
 3. Location: Mount closers on inside of exterior doors, room side of interior doors typical; mount on pull side of other doors.
 4. Operating Pressure: Maximum operating pressure as follows.
 - a. Interior Doors: Maximum 5 pounds.
 - b. Exterior Doors: Maximum 10 pound.
 - c. Fire Rated Doors: As required for fire rating, maximum 15 pounds.
- G. Manual Bolts, Protection Plates, Gaskets, Thresholds, and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
 1. Manual Bolts: ANSI A156.16 Grade 1 top and bottom flush bolts, with dust-proof floor strike.
 2. Kickplates: ANSI A156.6, metal; height indicated in Schedule by 1 inch less than door width; stainless steel.
 3. Weatherstripping: Furnish continuous weatherstripping at top and sides of exterior doors.
 4. Fire Rated Gaskets: Furnish continuous fire rated gaskets at top and sides of fire rated doors.
 5. Thresholds: Maximum 1/2 inch height; requirements to ensure accessibility for persons with disabilities.
 6. Floor Stops: ANSI A156.1 Grade 1 dome type; furnish with accessories as required for applications indicated.

2.03 ACCESSORIES

- A. Lock Trim: Furnish levers with escutcheon plate as indicated in Schedule.
- B. Through Bolts: Through bolts and grommet nuts are not permitted on door faces in occupied areas unless no alternative is possible.
 1. Do not use through bolts on solid wood core doors.

SECTION 087100 - DOOR HARDWARE

2.04 FINISHING

- A. Finishes: ANSI A156.18; with following finishes except where otherwise indicated in Schedule shown on drawings.
1. Hinges and Pivots:
 - a. BHMA 629 and 625, bright (polished) finish.
 - b. BHMA 630 and 626, satin finish.
 - c. BHMA 600, primed for painting.
 2. Typical Exterior Exposed and High Use Interior Door Hardware:
 - a. BHMA 630, satin finished stainless steel.
 - b. BHMA 629, bright (polished) stainless steel.
 - c. BHMA 625, bright (polished) chromium plated brass or bronze.
 - d. BHMA 626, satin chromium plated brass or bronze.
 - e. BHMA 605, bright brass (yellow), clear coated.
 - f. BHMA 613, oil rubbed satin bronze.
 3. Typical Interior Door Hardware:
 - a. BHMA 625, bright (polished) chromium plated brass or bronze.
 - b. BHMA 626, satin chromium plated brass or bronze.
 - c. BHMA 630, satin finished stainless steel.
 - d. BHMA 629, bright (polished) stainless steel.
 - e. BHMA 605, bright brass (yellow), clear coated.
 - f. BHMA 613, oil rubbed satin bronze.
 4. Closers:
 - a. BHMA 628, satin aluminum, clear anodized.
 5. Thresholds:
 - a. BHMA 630, satin finished stainless steel.
 6. Other Items: Provide manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify doors and frames are ready to receive work and dimensions are as indicated.
- B. Verify electric power is available to power operated devices and is of correct characteristics.

SECTION 087100 - DOOR HARDWARE

3.02 INSTALLATION

- A. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.
- B. Mounting Heights from Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes.

END OF SECTION

SECTION 089100 - LOUVERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fixed louvers.

1.02 SUBMITTALS

- A. Shop Drawings: Indicate louver layout plan and elevations; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- B. Product Data: Submit data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with AMCA Certification for Water Penetration, Air Performance, and Wind Driven Rain, in compliance with AMCA 500-L. Attach AMCA seal to louvers.
- B. Perform Work in accordance with New York State standards.

1.04 WARRANTY

- A. Furnish twenty year manufacturer warranty for louvers.
- B. Warranty: Include coverage for degradation of epoxy finish.

PART 2 - PRODUCTS

2.01 WALL LOUVERS - DRAINABLE STYLE

A. Manufacturers:

1. Greenheck Fan Corporation
2. Substitutions: approved equal.

B. Louver Construction: Aluminum.

C. Louver Panel Thickness: 4 inches deep, face measurements as indicated on Drawings.

D. Louver Blade Design: Sloped at 45 degrees; dual drain style.

SECTION 089100 - LOUVERS

- E. Louver: To permit passage of air at a velocity of 750 ft / min without blade vibration or noise, with maximum static pressure loss of 2 inches measured at 2,500 ft / min.
- F. Louver: To permit 50 percent free area.
- G. Water Penetration: Not more than 0.01 oz/sq ft of free area at minimum 1,007 ft / min face velocity.

2.02 COMPONENTS

- A. Aluminum: 6063-T5 extruded prefinished with shop applied mill finish.
- B. Bird Screen: Interwoven wire mesh of aluminum, 0.051 inch diameter wire, ¾ inch open weave, diagonal design.

2.03 ACCESSORIES

- A. Fasteners and Anchors: Galvanized steel type.
- B. Flashings: Of same material as louver frame.

2.04 FABRICATION

- A. Louver Blade Design: Slope and style as specified for each louver type; material thickness of 0.081 inch heavy gage extruded minimum.
- B. Louver Frame: Channel shape, mechanically fastened corner joints, material thickness of 0.081 inch heavy gage extruded minimum. Form perimeter of frames with recessed channel to retain backer rod for sealant application.
- C. Intermediate Mullions: Exposed of extruded aluminum, profiled to suit louver frame.
- D. Head and Sill Flashings: Extruded to required shape, single length in one piece for each location.
- E. Screens: Install screen mesh in shaped frame, reinforce corner construction.

2.05 FACTORY FINISHING

- A. Exterior Aluminum Surfaces: Mill finish.
- B. Interior Aluminum Surfaces and Screens: Unfinished.

SECTION 089100 - LOUVERS

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify prepared openings and flashings are ready to receive Work and opening dimensions are as indicated on shop drawings.

3.02 INSTALLATION

- A. Install louvers level and plumb.
- B. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- C. Secure louvers in opening framing with exposed fasteners, removable for maintenance purposes.
- D. Install bird screen and frame to exterior of louver.
- E. Install Work in accordance New York State standards.

END OF SECTION

SECTION 089100 - LOUVERS

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DIVISION 9

FINISHES

SECTION 099000 – PAINTING AND COATING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Concrete masonry units (CMU).
 - 2. Cast Iron, Ductile Iron, Steel.

1.02 DEFINITIONS

- A. Refer to ASTM D16 for definitions of terms used in this Section.

1.03 REFERENCE STANDARDS

- A. ASTM International:
 - 1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
 - 2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. Master Painters Institute:
 - 1. MPI - Approved Products List.
 - 2. MPI - Architectural Painting Manual.

1.04 PREINSTALLATION MEETINGS

- A. Convene minimum one week prior to commencing Work of this Section.

1.05 SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

SECTION 099000 – PAINTING AND COATING

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:
 - 1. Product name and type (description).
 - 2. Batch date.
 - 3. Color number.
 - 4. VOC content.
 - 5. Environmental handling requirements.
 - 6. Surface preparation requirements.
 - 7. Application instructions.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.07 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Lead Paint: It is not expected that lead paint will be encountered in the Work.
 - 1. If suspected lead paint is encountered, do not disturb; immediately notify Architect and Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- 1. Sherwin-Williams Company.
 - 2. Benjamin Moore & Co.
 - 3. Duron, Inc.
 - 4. Glidden Professional, Division of PPG Architectural Finishes, Inc.
 - 5. PPG Architectural Finishes, Inc.
 - 6. Pratt & Lambert.
- B. Source Limitations: Obtain paint materials from single source from single listed manufacturer.
 - 1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

SECTION 099000 – PAINTING AND COATING

2.02 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction[and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].

1. Nonflat Paints and Coatings: 150 g/L.
2. Primers, Sealers, and Undercoaters: 200 g/L.
3. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
4. Pretreatment Wash Primers: 420 g/L.

C. Colors: As selected by Owner.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.

1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

B. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Masonry (Clay and CMU): 12 percent.

C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

SECTION 099000 – PAINTING AND COATING

3.02 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP-6, "Commercial Blast" for Raw Water discharge header.
 - 2. SSPC-SP 3, "Power Tool Cleaning" for other.

3.03 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

SECTION 099000 – PAINTING AND COATING

3.04 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.05 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.06 INTERIOR PAINTING SCHEDULE

- A. CMU Substrates:
 - 1. All interior walls of Raw Water Pump Station Screen Room
 - 2. Waterborn Acrylic System:
 - a. Block Filler: Heavy Duty Block Filler B42 @ 12.0 – 15.0 mils dry resulting in a pinhole free substrate.
 - b. Intermediate Coat: Epoxy Polyamide, interior, matching topcoat. Macropoxy 646 FC @ 4.0 – 6.0 mils dry.
 - c. Topcoat: Moisture Cured Urethane, interior. COROTHANE ® I HS @ 2.0 – 3.0 mils dry.
- B. Metal Substrates:
 - 1. Raw Water Pump discharge piping and valves, Raw Water discharge header, screenings chamber, screening chamber supports, new structural steel, existing structural steel in Screen Room.

SECTION 099000 – PAINTING AND COATING

2. Epoxy/MCU System:

- a. Prime Coat: Moisture Cured Bonding Primer: Corothane I Preprime @ 1.5 – 2.0 mils dry.
- b. Intermediate Coat: Epoxy Polyamide, interior, matching topcoat. Macropoxy 646 FC @ 4.0 – 6.0 mils dry.
- c. Topcoat: Moisture Cured Urethane, interior. Corothane HS @ 2.0 – 3.0 mils dry.
- d. Provide a prime coat @ 1.0 mil for shop primed items.

END OF SECTION

DIVISION 14
CONVEYING EQUIPMENT

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

PART 1 - GENERAL

1.01 SUMMARY

- A. The work required under this section shall include the materials, labor, equipment, designing, manufacturing, shipping, installing and field testing of a top running, double girder, overhead traveling bridge crane, with electric wire rope trolley hoist.
- B. The crane system shall include bridge, trolley, hoist, power and control circuit conductors, safety and control mechanisms, and all other parts and services as defined in this specification. The crane system shall be installed on the runway girders and rails. In addition to material and equipment specified, incidental materials to effect a complete installation shall be provided.
- C. On-site training of Owner's personnel will be provided by the manufacturer. This will include but not necessarily be limited to: techniques of safe operation, daily and monthly inspections, minor troubleshooting. Two four (4) hour training sessions are required.

1.02 REFERENCES

- A. Crane Manufacturers Association of America (CMAA)
 - 1. Specification No. 70 – Specifications for Top Running Bridge & Gantry Type Multiple Girder Electric Overhead Traveling Cranes (2004)
- B. American National Standard (ANSI) / American Society of Mechanical Engineers (ASME)
 - 1. ANSI / ASME HST-4 - Performance Standard for Overhead Electric Wire Rope Hoists (1999)
 - 2. ANSI / ASME B30.2 - Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist) (2011)
- C. Occupational Safety and Health Administration (OSHA)
 - 1. Part 1910.179 - Overhead & Gantry Cranes
 - 2. Part 1926.554 - Overhead Hoists
- D. National Electric Manufacturer's Association (NEMA)
- E. Hoist Manufacturers Institute (HMI)
- F. National Fire Protection Association (NFPA)
 - 1. NFPA-70 National Electric Code
- G. American National Standard (ANSI) / American Institute of Steel Construction (AISC)
 - 1. ANSI/AISC 360 - Specification for Structural Steel for Buildings (2005)
- H. American Welding Society (AWS)
 - 1. D1.1 - Structural Welding Code - Steel
 - 2. D14.1 - Overhead Cranes

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

1.03 OPERATING SPECIFICATIONS

Location:	Sturgeon Point Raw Water Pumping Station – Pump Room
Capacity:	15 tons
Duty Class:	CMAA Class C
Span:	27'- 8"
Bridge Girder Deflection:	L/600
End Trucks:	Dual drive with fixed axles. Motors shall include AC magnetic disc brakes per CMAA requirements. Wheelbase-to-span ratio shall not exceed 7:1.
Hoist:	Electric wire rope hoist.
Lift:	32' above the basement floor with two wraps remaining on drum at lowest hook position.
Trolley:	Motor driven with two drive wheels and brakes per CMAA requirements.
Speeds:	Bridge: 105 fpm, infinitely variable Hoist: 25/3.9 fpm, two speed Trolley: 66 fpm, infinitely variable
Voltage:	208 Volt, 3 Phase, 60 Hertz, 115 volt integral control.
Bumpers:	Rubber bumpers on end trucks and trolley per CMAA requirements.
Control:	Radio Control with backup pendant from independent track on bridge.
Enclosures:	NEMA 4, Minimum.

1.04 SUBMITTALS

A. Shop Drawings

1. Submit for approval, Shop Drawings showing complete details, dimensions, field coordinates and bills of material for fabrication and erection. Drawings shall be stamped by a Professional Engineer, duly licensed in the State of New York.
2. Include member sizes, model numbers, specifications, reactions and complete shop and field notes such as welding symbols, paint requirements, bolt sizes, etc.
3. Submit complete calculations for member sizes, horsepowers, design criteria and seismic calculations stamped as per 1 above.

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

- B. Product Data
 - 1. Provide information on all components, sub-assemblies, control systems, mechanical features, etc. relating to the equipment supplied under this specification.
 - 2. Include brochures, catalog cuts, parts breakdowns, operation and maintenance manuals, clearance diagrams, dimensional data (not supplied in the shop drawings) and any other data necessary for the engineer to determine compliance with specifications.
- C. Wiring Diagrams
 - 1. Provide complete, integrated wiring diagrams for all the equipment provided under this specification on crane supplier's letterhead. Catalog cuts will not be acceptable.

1.05 QUALITY ASSURANCE

- A. Crane suppliers shall have documented experience of ten (10) years, having successfully designed and built installations of similar scope.
- B. Crane suppliers shall be responsible for providing equipment of highest quality and workmanship which will perform specific functions reliably and safely and allow required maintenance procedures with a minimum amount of interference to operation of the equipment.
- C. A copy of the crane supplier's Quality Assurance Plan shall be made available to customer for review prior to award.
- D. Equipment not meeting all requirements of this specification will be replaced with compliant components at no additional cost to the owner.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Unloading and storage of crane shall be under the direct supervision of manufacturer.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. All major components shall be manufactured in the USA and complete repair parts shall be stocked locally by the crane supplier. All controls shall be interchangeable as much possible.
- B. Hoists, trolleys, bridge end trucks, drives and controls shall all be from only one supplier and shall meet the requirements of this specification.

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

- C. Suppliers include:
 - 1. R&M Materials Handling
 - 2. CraneWerks
 - 3. Kone Cranes
 - 4. North American Industries, Inc.
 - 5. Simmers Crane Design & Services

2.02 RUNWAY ELECTRIFICATION

- A. The runway conductors shall be Figure-8, rolled galvanized steel bar as supplied by Duct-O-Wire Corporation. The minimum capacity of the conductor bar shall be 110 amp or larger to carry the necessary ampere load without undue heating.
- B. A four conductor configuration shall be provided with all brackets, hangers, splice covers, power feeds, expansion gap assemblies and collectors as required by Duct-o-wire.
- C. When Variable Frequency Drives are provided, tandem collector shoes shall be provided.

2.03 RUNWAY BEAMS and RAILS

- A. Runway beams shall be provided by the Contractor.
- B. End stops and electrification brackets shall be supplied by the crane manufacturer. End stops shall be formed of malleable angle iron and provided at all dead end track sections. End stops shall be bolted to both sides of the rail to prevent end trucks from running off track ends.
- C. Rails shall be ASCE rails, sized according to the crane wheel loads. Rails, splice bars and bolts shall be supplied by the crane supplier.
- D. The runway rails shall be attached to the runway beams using hook bolts, rail clips or clamps, as determined by the crane supplier.

2.04 CRANE BRIDGE

- A. Bridge Girder
 - 1. Girders shall be designed to resist all vertical, horizontal and torsional forces.
 - 2. Bridge girders shall be new, ASTM A992 Hot Rolled structural steel shapes designed to meet the requirements of CMAA.
- B. End Trucks
 - 1. End trucks shall be constructed of structural steel tubes, providing a rigid structure. Design shall allow easy wheel removal and exchange.
 - 2. End trucks shall be fitted with shock absorbing bumpers.
 - 3. Crane wheels shall be high strength ductile iron, machined with double flanges and straight treads, flame hardened to 300 Bn. Wheels shall be sized to meet the minimum allowable wheel loads per CMAA. The wheel axle assembly shall rotate on dual high quality anti-friction, lifetime lubricated bearings having a minimum life of 5,000 hours.

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

4. The end truck to girder connection shall be bolted for easy removal of end truck. Bridge girder shall be coped to provide the highest possible positioning of the runway beams.
- C. Bridge and Trolley Drives
1. Bridge drives shall employ fixed axles with totally enclosed motors. Trolleys shall employ two drive wheels.
 2. Motors shall be TENV, Class F insulated with a temperature activated switch in the windings, 30 minute rated, 1800 RPM..
 3. The gear reducers shall be fully enclosed with oil bath for gears.

2.05 WIRE ROPE HOIST

- A. Hoist Motor and Braking System
1. Hoist motor shall develop sufficient power to lift the rated load at the specified speed. Motors shall be TENV, Class F insulated with a temperature activated switch, 30 minute rated, 1800 RPM. Hoist motor shall not be placed inside of hoist drum.
 2. The hoist shall have a DC rectified disc type motor brake. Brake material shall not contain asbestos.
- B. Hoist Gearing
1. Hoist gearing shall be helical, heat treated alloy steel and shall operate in an oil bath.
- C. Hoist Drum and Rope
1. The rope drum shall be welded construction, deep grooved and precision machined to give maximum rope life. Drum shall be supported at each end by sealed anti-friction bearings.
 2. The hoisting rope shall be of a proper design and construction for hoist service. The rated capacity load divided by the number of parts of rope shall not exceed 20% of the breaking strength of the rope.
 3. Double wrapping of the rope shall not be permitted. A drum rope guide shall be provided. A minimum of two wraps shall remain on the drum with the hook in the lowest position.
 4. Bottom block shall have a totally enclosed housing fabricated of steel. The rope sheaves shall be supported on an anti-friction thrust bearing. Hook shall be a single barbed type hook as supplied by Crosby and shall be equipped with a heavy spring safety latch.
 5. Hoist shall be equipped with upper and lower limit switches as well as a redundant block operated upper limit switch. The switches shall be adjustable to set the extreme upper and lower limits of hook travel.
 6. Hoist shall be equipped with an overload device to prevent lifting loads in excess of 125%.

2.06 BRIDGE ELECTRIFICATION AND CONTROLS

- A. Electrification
1. To supply the electrical power across the crane for bridge, trolley and hoist motions, a flat cable festoon system shall be utilized. The flat cable shall be extra flexible with color coded wires according to NEMA standards. Wire shall be

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

2. stranded copper per CMAA.
 2. The trolleys that carry the flat cable shall have steel wheels with sealed ball bearings. The c-track that the trolley operates in shall be a minimum of 14 gage galvanized metal.
 3. Flat cable connectors shall be heat shrinkable, corrosion resistant and flame retardant
- B. Controls
1. Bridge, trolley and hoist controls shall be mounted in NEMA 4 enclosures.
 2. A magnetic mainline contactor, controlled by momentary on/off switches on the pushbutton shall be included.
 3. A control transformer shall be provided with separate and isolated primary and secondary winding, all copper wound. Control voltage shall not exceed 120 volts.
 4. Trolley and hoist functions shall be controlled by separate magnetic contactors.
 5. Bridge functions shall be controlled by a variable frequency drive.
 6. All controls shall be sized to meet ambient temperatures. A cooling system will be provided for each enclosure when the ambient temperature exceeds the maximum allowable operating temperature of the individual electrical components.
- C. Pendant Station
1. A NEMA 4, Hubbell pendant station will be provided with a separate pushbutton for each direction. A red mushroom head “off” switch and a separate “on” switch shall be supplied. Operators shall be two-speed.
 2. The enclosures shall have durable, clearly marked legend plates, guards to protect switches from damage or accidental actuation and shall allow for right or left hand operation. Arrangement shall be as used on other existing cranes in the facility.
- D. Radio Controls
1. 2-step pushbuttons and emergency-Stop pushbutton
 2. Robust plastic housing, protection class IP65 with comfortable carrying hand strap.
 3. Rechargeable Li-ion batteries, providing 16 hours of operating time at 50% Effective Duty and LED indication of battery and operating status.
 4. Cranes, solo hoists, chain hoists with motorized travel motions
 5. Internal antenna in the receiver and in the transmitter, VHF (400-465 MHz) and UHF (800-930 MHz) bandwidths
 6. General Technical Specifications
 - a. Transmitter protection: NEMA Type 4 (IP65)
 - b. Receiver protection: NEMA Type 4 (IP65)
 - c. Approvals: CSA, c/us
 - d. Operating Frequency: 48
 - e. Operating Temperature: -4°F to 158°F (-20 to 70°C)
 7. Provide two radio controls with chargers.

2.07 PAINTING

- A. All structural steel shall be cleaned of rust and mill scale with a minimum SSPC-6 “commercial blast” cleaning.
- B. Cranes shall be painted with 2.0 mil DFT Primer & 2.5- 3.0 mil DFT Safety Yellow Industrial Enamel.

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

- C. Hoists shall be painted per the Hoist manufacturer's standard coating. Hooks shall not be painted.
- D. Structural components shall be painted with 2.0 mil DFT Primer & 2.5-3.0 mil DFT Gray Industrial Enamel.

2.08 MISCELLANEOUS

- A. Quality and Spare Parts
 - 1. To properly serve the crane user's needs of after sales service and spare parts, the manufacturer shall have local availability of service and spare parts.
- B. Factory Testing
 - 1. Following complete assembly of the crane in the factory, all components shall be tested to insure correct operation.
 - 2. Push-buttons shall be tested for operation of each movement.
 - 3. All motors shall be phased correctly in the factory for proper operation.

2.09 INTERCHANGEABILITY

- A. Provide like parts on components furnished which are interchangeable and give particular attention to items that may require replacement or adjustment during the life of the crane.

2.010 SAFETY DEVICES

- A. Each crane will be provided with all safety devices required by federal, state or local law.
- B. Each Crane will be provided with a capacity plate with 3 inch high letters on each side of the crane giving the capacity in tons.
- C. Cranes shall be supplied with a readily accessible power disconnect on the bridge, adjacent to or part of the control panel.

2.011 MATERIALS

- A. All materials shall be new and meet the requirements of CMAA, HMI, NEC and NSI. All load bearing parts shall have a 5:1 factor of safety.
- B. Structural steel used in the fabrication of bridge girders and end trucks shall be new and meet the minimum ASTM standards.

2.012 SHIPPING

- A. After factory tests are completed, disassemble the crane into major components for shipment with all major points of attachment match-marked to facilitate final assembly, and all exposed finished parts coated with compound before shipment. Properly pack all small parts in boxes with parts identification clearly marked on the outside of each box.
- B. The crane manufacturer shall pay all costs of packing, loading, shipping and unloading of the crane at the job site.

SECTION 146300 – TOP RUNNING DOUBLE GIRDER BRIDGE CRANE

- C. Crane manufacturer shall replace all parts of the cranes that are damaged or lost in shipment without cost to the Owner.

PART 3 - EXECUTION

3.01 CRANE ERECTION

- A. The crane supplier shall receive, unload, and erect the cranes in accordance with applicable codes and specifications as referenced in the beginning of this specification. Installers shall be employees of the supplier and have five years' experience installing overhead cranes.
- B. Holes shall not be drilled or flame cut in any part of trusses or other parts of the building structure without permission from the Engineer.
- C. Welding to the building structure must also be approved by the Engineer.

3.02 ELECTRICAL WORK

- A. The crane installer shall provide all wiring and electrification in accordance with the National Electric Code.

3.03 FIELD QUALITY CONTROL

- A. Acceptance Test
 1. Conduct testing for final acceptance after the erection work has advanced to the point that inspection and testing can proceed without interruption.
 2. Allow inspection of all parts of the crane containing electrical parts or moving mechanical parts by the Engineer.
 3. Test the cranes for capacity, speed and deflections in the presence of the Engineer and owner with 125 percent of the hoist capacity load on the hook. Test weights shall be supplied by crane supplier.
 4. Crane supplier will transmit to the owner a certificate of load test and compliance with OSHA requirements.

3.04 TRAINING

- A. Following the acceptance testing, the crane supplier will provide the Owner's personnel with two, four (4) hour training sessions of instruction and field training to meet the requirements of ANSI B30.2 and OSHA 179.1 for Operator Training.
- B. The instruction will include but not necessarily be limited to: techniques of safe operation, daily and monthly inspections, minor troubleshooting.
- C. The field training will consist of having the operators actually operate the crane and perform a daily inspection.
- D. A written exam will be conducted to insure the operator's understanding and compliance with the required codes of conduct.

END OF SECTION

DIVISION 22

PLUMBING

SECTION 220503 - PIPES AND TUBES FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Pipe and pipe fittings for the following systems:

1. Potable water piping.
2. Process water piping.
3. Backflow preventer drains.
4. Frazil ice control piping.
5. Electrical manhole mdrain, sump pump discharge, and overflow piping.

B. Related Sections:

1. Section 220523 - General-Duty Valves for Plumbing Piping: Product requirements for valves for placement by this section.

1.02 REFERENCES

A. American Society of Mechanical Engineers:

1. ASME B31.9 - Building Services Piping.

B. ASTM International:

1. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
2. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
3. ASTM D2665 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
4. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
5. ASTM B75 - Standard Specifications for Seamless Copper Tube.
6. ASTM B88 - Standard Specifications for Seamless Copper Water Tube.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate layout of piping systems, including equipment, critical dimensions, and sizes.

C. Product Data: Submit data on pipe materials and fittings. Submit manufacturers catalog information.

SECTION 220503 - PIPES AND TUBES FOR PLUMBING PIPING AND EQUIPMENT

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.
- B. Perform Work in accordance with New York State standards.
- C. Maintain one copy of each document on site.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years' experience.
- B. Installer: Company specializing in performing work of this section with minimum 1 year experience.

1.06 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Furnish temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate installation of buried piping with trenching.

SECTION 220503 - PIPES AND TUBES FOR PLUMBING PIPING AND EQUIPMENT

PART 2 - PRODUCTS

2.01 PVC PIPING

A. PVC Pipe:

1. Fittings: ASTM D2467, Schedule 80, PVC.
2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.

B. Flanges for Pipe 2 inches and Larger:

1. PVC Piping: PVC flanges.
2. CPVC Piping: CPVC flanges.
3. Gaskets: 1/16 inch thick preformed neoprene gaskets.

C. PVC Pipe Materials: For connections to equipment and valves with threaded connections, furnish solvent-weld socket to screwed joint adapters and unions, or ASTM D2464, Schedule 80, threaded, PVC pipe.

2.02 COPPER PIPING

A. Copper Tubing: ASTM B88, Type L drawn.

1. Fittings: ASTM B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
2. Joints: ASTM B32, Alloy Grade Sb5 tin-antimony, or Alloy Grade Sn95 tin-silver, lead free solder.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify excavations are to required grade, dry, and not over-excavated.
- C. Verify trenches are ready to receive piping.

3.02 PREPARATION

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

SECTION 220503 - PIPES AND TUBES FOR PLUMBING PIPING AND EQUIPMENT

- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.03 INSTALLATION - ABOVE GROUND PIPING

- A. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- C. Group piping whenever practical at common elevations.
- D. Sleeve pipe passing through partitions, walls and floors. Refer to Section 220529.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not accessible.
- H. Install non-conducting dielectric connections wherever jointing dissimilar metals.
- I. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum or per plans. Maintain gradients.
- J. Slope piping and arrange systems to drain at low points.
- K. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
- L. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- M. Install valves in accordance with Section 220523.

3.04 INSTALLATION - WATER PIPING SYSTEMS

- A. Install Work in accordance with New York State standards.

3.05 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements, 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Test water piping system in accordance with applicable code.

SECTION 220503 - PIPES AND TUBES FOR PLUMBING PIPING AND EQUIPMENT

3.06 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean and disinfect domestic water distribution system in accordance with Section 221100.

END OF SECTION

SECTION 220503 - PIPES AND TUBES FOR PLUMBING PIPING AND EQUIPMENT

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SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Ball valves.

B. Related Sections:

1. Section 220503 - Pipes and Tubes for Plumbing Piping and Equipment: Product and installation requirements for piping materials applying to various system types.

1.02 REFERENCES

A. ASTM International:

1. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
2. ASTM D4101 - Standard Specification for Propylene Injection and Extrusion Materials.

B. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturers catalog information with valve data and ratings for each service.

C. Manufacturer's Installation Instructions: Submit hanging and support methods, joining procedures.

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

1.04 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of valves.

C. Operation and Maintenance Data: Submit installation instructions, spare parts lists, exploded assembly views.

SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with New York State Building Code.
- B. Maintain one copy of each document on site.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing work of this section with minimum 3 years experience.

1.07 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- C. Provide temporary protective coating on cast iron and steel valves.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not install valves underground when bedding is wet or frozen.

1.10 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish five year manufacturer warranty for valves excluding packing.

SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 2 - PRODUCTS

2.01 BALL VALVES

A. Manufacturers:

1. Crane; Crane Energy Flow
2. Jenkins Valves.
3. NIBCO Inc.
4. Watts.

- B. 2 inches and Smaller: MSS SP 110, 600 psi WOG, two piece bronze body, chrome plated brass ball, full port, teflon seats, blow-out proof stem, solder or threaded ends, lever handle.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify piping system is ready for valve installation.

3.02 INSTALLATION

- A. Install valves with stems upright or horizontal, not inverted.
- B. Install 3/4 inch gate or ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.
- C. Install valves with clearance for installation of insulation and allowing access.
- D. Provide access where valves and fittings are not accessible.
- E. Install Work in accordance with New York State Building Code.

3.03 VALVE APPLICATIONS

- A. Install shutoff and drain valves at locations indicated on Drawings in accordance with this Section.
- B. Install ball or gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.

END OF SECTION

SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

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DIVISION 23

**HEATING, VENTILATING, AND AIR
CONDITIONING (HVAC)**

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Pipe markers.

1.02 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturers catalog literature for each product required.
- C. Shop Drawings: Submit list of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- D. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.03 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

1.04 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.05 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.

1.06 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

1.07 EXTRA MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 - PRODUCTS

2.01 NAMEPLATES

- A. Furnish materials in accordance with of New York State standards.
- B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.02 PIPE MARKERS

- A. Color and Lettering: Conform to ASME A13.1.
- B. Plastic Pipe Markers
 - 1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers
 - 1. Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.
- B. Prepare surfaces in accordance with Section 099000 for stencil painting.

3.02 INSTALLATION

- A. Apply stencil painting in accordance with Section 099000.
- B. Install identifying devices after completion of coverings and painting.
- C. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- D. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

- E. Identify control panels and major control components outside panels with plastic nameplates.
- F. Identify piping, concealed or exposed, with plastic pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.
- G. For exposed natural gas lines other than steel pipe, attach yellow pipe labels with "GAS" in black lettering, at maximum 5 foot spacing.

END OF SECTION

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

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SECTION 231123 - FACILITY NATURAL-GAS PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Natural gas piping above grade.
2. Unions and flanges.
3. Valves.
4. Pipe hangers and supports.

B. Related Sections:

1. Section 099000 - Painting and Coating: Product requirements for painting for placement by this section.
2. Section 230503 - Pipes and Tubes for HVAC Piping and Equipment: Piping materials for gas piping systems.
3. Section 230523 - General-Duty Valves for HVAC Piping: Valves for gas piping systems.

1.02 REFERENCES

A. American National Standards Institute:

1. ANSI Z21.15 - Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves.

B. American Society of Mechanical Engineers:

1. ASME B16.3 - Malleable Iron Threaded Fittings.
2. ASME B16.33 - Manually Operated Metallic Gas Valves for Use in Gas Piping Systems Up to 125 psig (sizes 1/2 - 2).
3. ASME B31.9 - Building Services Piping.
4. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.

C. ASTM International:

1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.

D. American Welding Society:

1. AWS D1.1 - Structural Welding Code - Steel.

E. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.

SECTION 231123 - FACILITY NATURAL-GAS PIPING

2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
4. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

F. National Fire Protection Association:

1. NFPA 54 - National Fuel Gas Code.

1.03 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.
- B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded or threaded connections to valves, equipment.
- C. Provide pipe hangers and supports in accordance with MSS SP 58.
- D. Use plug or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data:
 1. Piping: Submit data on pipe materials, fittings, and accessories. Submit manufacturers catalog information.
 2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
 3. Hangers and Supports: Submit manufacturers catalog information including load capacity.
- C. Design Data: Indicate pipe size. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- D. Test Reports: Indicate results of natural gas piping system pressure test.
- E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
- F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

SECTION 231123 - FACILITY NATURAL-GAS PIPING

- B. Project Record Documents: Record actual locations of valves, piping system, and system components.
- C. Operation and Maintenance Data: Submit for valve installation instructions, spare parts lists.

1.06 QUALITY ASSURANCE

- A. Perform natural gas Work in accordance with NFPA 54.
- B. Perform work in accordance with applicable code NYS Fuel Gas Code and local gas company requirements.
- C. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.
- D. Perform Work in accordance with authority having jurisdiction for welding hanger and support attachments to building structure.
- E. Furnish shutoff valves complying with ASME B16.33 or ANSI Z21.15.
- F. Perform Work in accordance with NYS standards.
- G. Maintain one copy of each document on site.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years' experience.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- C. Protect piping and fittings from soil and debris with temporary end caps and closures. Maintain in place until installation. Furnish temporary protective coating on cast iron and steel valves.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements.

SECTION 231123 - FACILITY NATURAL-GAS PIPING

1.10 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.11 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.

1.12 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five-year manufacturer's warranty for valves excluding packing.

PART 2 - PRODUCTS

2.01 NATURAL GAS PIPING, ABOVE GRADE

- A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
 - 1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M forged steel welding type.
 - 2. Joints: Threaded for pipe 2 inch and smaller; welded for pipe 2-1/2 inches and larger.

2.02 UNIONS AND FLANGES

- A. Unions for Pipe 2 inches and Smaller:
 - 1. Ferrous Piping: Class 150, malleable iron, threaded.
- B. Flanges for Pipe 2-1/2 inches and Larger:
 - 1. Ferrous Piping: Class 150, forged steel, slip-on flanges.
 - 2. Gaskets: 1/16 inch thick preformed neoprene gaskets.

2.03 BALL VALVES

- A. Furnish materials in accordance with NYS standards.
- B. 1/4 inch to 1 inch: MSS SP 110, Class 125, two piece, threaded ends, bronze body, chrome plated bronze ball, reinforced teflon seats, blow-out proof stem, lever handle, UL 842 listed for flammable liquids and LPG, full port.
- C. 1-1/4 inch to 3 inch: MSS SP 110, Class 125, two piece, threaded ends, bronze body, chrome plated bronze ball, reinforced teflon seats, blow-out proof stem, lever handle, UL 842 listed for flammable liquids and LPG, conventional port.

SECTION 231123 - FACILITY NATURAL-GAS PIPING

2.04 PLUG VALVES

- A. Furnish materials in accordance with NYS standards.
- B. PL-1 2 inches and Smaller: MSS SP 78, Class 150, construction, round port, full pipe area, pressure lubricated, teflon packing, threaded ends. Furnish one plug valve wrench for every ten plug-valves with minimum of one wrench.
- C. 2-1/2 inches and Larger: MSS SP 78, Class 150, construction, round port, full pipe area, pressure lubricated, teflon packing, flanged ends. Furnish wrench-operated.

2.05 PIPE HANGERS AND SUPPORTS

- A. Furnish materials in accordance with NYS standards.
- B. Conform to NFPA 54 and MSS SP 58.
- C. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron or Carbon steel, adjustable swivel, split ring.
- D. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
- E. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- F. Wall Support for Pipe 3 inches and Smaller: Cast iron hook.
- G. Vertical Support: Steel riser clamp or Angle ring.
- H. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

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

SECTION 231123 - FACILITY NATURAL-GAS PIPING

3.03 INSTALLATION - PIPE HANGERS AND SUPPORTS

- A. Install hangers and supports in accordance with ASME B31.9, ASTM F708, and MSS SP 89.
- B. Support horizontal piping hangers as scheduled.
- C. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- D. Place hangers within 12 inches of each horizontal elbow.
- E. Install hangers to allow 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- F. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
- G. Where installing several pipes in parallel and at same elevation, provide multiple pipe hangers or trapeze hangers.
- H. Prime coat exposed steel hangers and supports in accordance with Section 099000. Finish paint exposed steel hangers and supports in accordance with Section 099000. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- I. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

3.04 INSTALLATION - ABOVE GROUND PIPING SYSTEMS

- A. Install natural gas piping in accordance with NFPA 54.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient.
- D. Where required, bend pipe with pipe bending tools in accordance with procedures intended for that purpose.
- E. Install piping to conserve building space and not interfere with use of space.
- F. Size and install gas piping to provide sufficient gas to supply maximum appliance demand at pressure higher than appliance minimum inlet pressure.
- G. Group piping whenever practical at common elevations.
- H. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- I. Provide clearance for installation of insulation and access to valves and fittings.
- J. Provide access where valves and fittings are not exposed.

SECTION 231123 - FACILITY NATURAL-GAS PIPING

- K. Provide support for utility meters in accordance with requirements of utility company.
- L. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting. Refer to Section 099000.
- M. Install identification on piping systems. Refer to Section 230553.
- N. Install valves with stems upright or horizontal, not inverted.
- O. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

3.05 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Where gas appliance will be damaged by test pressure, disconnect appliance and cap piping during pressure test. Reconnect appliance after pressure test and leak test connection.
- C. Where gas appliance is designed for operating pressures equal to or greater than piping test pressure, provide gas valve to isolate appliance or equipment from gas test pressure.
- D. Pressure test natural gas piping in accordance with NFPA 54.

3.06 SCHEDULES

- A. Valve Service:
 - 1. Natural-Gas Piping: SCH40 Black Steel.
- B. Pipe Hanger Spacing:
- C. Steel Pipe Hanger Spacing:
 - 1. Pipe Size 1/2 Inch:
 - a. Maximum Hanger Spacing: 6 feet.
 - b. Hanger Rod Diameter: 3/8 inch.
 - 2. Pipe Size 3/4 Inch:
 - a. Maximum Hanger Spacing: 7 feet.
 - b. Hanger Rod Diameter: 3/8 inch.
 - 3. Pipe Size 1 Inch:
 - a. Maximum Hanger Spacing: 7 feet.
 - b. Hanger Rod Diameter: 3/8 inch.

SECTION 231123 - FACILITY NATURAL-GAS PIPING

4. Pipe Size 1-1/4 Inches:
 - a. Maximum Hanger Spacing: 7 feet.
 - b. Hanger Rod Diameter: 3/8 inch.
5. Pipe Size 1-1/2 Inches:
 - a. Maximum Hanger Spacing: 9 feet.
 - b. Hanger Rod Diameter: 3/8 inch.
6. Pipe Size 2 Inches:
 - a. Maximum Hanger Spacing: 10 feet.
 - b. Hanger Rod Diameter: 3/8 inch.
7. Pipe Size 2-1/2 Inches:
 - a. Maximum Hanger Spacing: 10 feet.
 - b. Hanger Rod Diameter: 1/2 inch.
8. Pipe Size 3 Inches:
 - a. Maximum Hanger Spacing: 10 feet.
 - b. Hanger Rod Diameter: 1/2 inch.

END OF SECTION

SECTION 233400 - HVAC FANS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Upblast centrifugal roof fans.
- B. Related Sections:
 - 1. Section 075403 – Sheet Membrane Roofing – Fully Adhered.
 - 2. Section 260503 - Equipment Wiring Connections: Execution and product requirements for connecting equipment specified by this section.

1.02 REFERENCES

- A. American Bearing Manufacturers Association:
 - 1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
 - 2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- B. Air Movement and Control Association International, Inc.:
 - 1. AMCA 99 - Standards Handbook.
 - 2. AMCA 204 - Balance Quality and Vibration Levels for Fans.
 - 3. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
 - 4. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
 - 5. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate size and configuration of fan assembly, mountings, weights, ductwork and accessory connections.
- C. Product Data: Submit data on each type of fan and include accessories, fan curves with specified operating point plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Submit fan manufacturer instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

SECTION 233400 - HVAC FANS

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.05 QUALITY ASSURANCE

- A. Performance Ratings: Conform to AMCA 210 and bear AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.
- C. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- D. Balance Quality: Conform to AMCA 204.
- E. Perform Work in accordance with New York State standards.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years' experience.

1.07 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Protect motors, shafts, and bearings from weather and construction dust.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

SECTION 233400 - HVAC FANS

1.10 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five-year manufacturer's warranty for fans.

1.11 MAINTENANCE SERVICE

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance service.

1.12 EXTRA MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 - PRODUCTS

2.01 UPBLAST CENTRIFUGAL ROOF FANS

- A. Manufacturers:
 - 1. Greenheck Fan Corporation
 - 2. Dayton
 - 3. Substitutions: Approved equal.
- B. Fan Unit: Upblast type. V-belt drive, spun aluminum housing with grease tray; resilient mounted motor; aluminum wire bird screen; square base to suit roof curb with continuous curb gaskets.
- C. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.
- D. Motor: NEMA premium efficient motor VFD rated.
- E. Roof Curb: 18 inch high self-flashing of galvanized steel construction with continuously welded seams.
- F. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor NEMA 250 Type 1 enclosure.
- G. Accessories:
 - 1. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked.

SECTION 233400 - HVAC FANS

2. Motor Operated Damper: Aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked and line voltage motor drive, power open, spring return.

H. Performance:

1. EF-1
 - a. Air Flow: 14,400 cfm.
 - b. Static Pressure: 0.25 inch wg.
 - c. Fan Tip Speed: 5,506 fpm.
 - d. Fan RPM: 584.
2. EF-2
 - a. Air Flow: 11,000 cfm.
 - b. Static Pressure: 0.18 inch wg.
 - c. Fan Tip Speed: 8,111 fpm.
 - d. Fan RPM: 1,016.
3. EF-3
 - a. Air Flow: 2,500 cfm.
 - b. Static Pressure: 0.20 inch wg.
 - c. Fan Tip Speed: 3,600 fpm.
 - d. Fan RPM: 743.

I. Electrical Characteristics and Components:

1. EF-1
 - a. Electrical Characteristics: In accordance with Section 260503 and the following:
 - 1) 3 hp. 10.6 rated load amperes.
 - 2) 208 volts, three phase, 60 Hz.
 - b. Controls: Thermostat.
2. EF-2
 - a. Electrical Characteristics: In accordance with Section 260503 and the following:
 - 1) 5 hp. 16.7 rated load amperes.
 - 2) 208 volts, three phase, 60 Hz.
 - b. Controls: Thermostat.

SECTION 233400 - HVAC FANS

3. EF-3
 - a. Electrical Characteristics: In accordance with Section 260503 and the following:
 - 1) 3/4 hp. 6.6 rated load amperes.
 - 2) 208 volts, single phase, 60 Hz.
 - b. Controls: Thermostat and VOC Sensor.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify roof curbs are installed and dimensions are as shown on shop drawings instructed by manufacturer.

3.02 INSTALLATION

- A. Secure roof fans with cadmium plated steel lag screws to roof curb.
- B. Install backdraft dampers on inlet to roof exhaust fans.
- C. Install safety screen where inlet or outlet is exposed.
- D. Install backdraft dampers on discharge of exhaust fans and as indicated on Drawings.
- E. Provide sheaves required for final air balance.

3.03 MANUFACTURER'S FIELD SERVICES

- A. Section 014000 - Quality Requirements: Requirements for manufacturers field services.

3.04 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Vacuum clean coils and inside of fan cabinet.

3.05 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.

SECTION 233400 - HVAC FANS

- B. Demonstrate fan operation.

3.06 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Do not operate fans for until ductwork is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION

SECTION 233700 - AIR OUTLETS AND INLETS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Louvers.

B. Related Sections:

1. Section 089100 - Louvers: Wall Louvers.
2. Section 099000 - Painting and Coating: Execution and product requirements for Painting of ductwork visible behind outlets and inlets specified by this section.

1.02 REFERENCES

A. Air Movement and Control Association International, Inc.:

1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:

1. ASHRAE 70 - Method of Testing for Rating the Performance of Air Outlets and Inlets.

C. Sheet Metal and Air Conditioning Contractors:

1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit sizes, finish, and type of mounting. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

C. Test Reports: Rating of air outlet and inlet performance.

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

1.04 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of air outlets and inlets.

SECTION 233700 - AIR OUTLETS AND INLETS

1.05 QUALITY ASSURANCE

- A. Test and rate louver performance in accordance with AMCA 500.
- B. Perform Work in accordance with New York State standards.

1.06 QUALIFICATIONS

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

1.07 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.

1.08 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five-year manufacturer's warranty for air outlets and inlets.

1.09 EXTRA MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 - PRODUCTS

2.01 LOUVERS

- A. Manufacturers:
 - 1. Greeheck Fan Corporation
 - 2. Substitutions: Approved equal.
- B. Louvers: As specified in Section 089100.
- C. Product Description: Stationary Drainable.
- D. Type: 4 inch deep with blades on 45 degree slope, heavy channel frame.
- E. Fabrication: 12 gage thick extruded aluminum, welded assembly, with factory mill finish.
- F. Mounting: Furnish with exterior flat flange for installation.

SECTION 233700 - AIR OUTLETS AND INLETS

- G. Bird Screen: Bird screen with 1/2 inch square mesh for exhaust and 3/4 inch for intake.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify inlet and outlet locations.
- C. Verify ceiling systems are ready for installation.

END OF SECTION

SECTION 233700 - AIR OUTLETS AND INLETS

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SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Type B double wall gas vents.

1.02 DEFINITIONS

- A. Vent: Portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.
- B. Vent Connector: Part of a venting system that conducts flue gases from flue collar of an appliance to a chimney or vent, and may include a draft control device.

1.03 SUBMITTALS

- A. Manufacturer's Installation Instructions: Assembly, support details, and connection requirements.
- B. Manufacturer's Certificate: Products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

- A. Perform Work according to New York State Standards.
- B. Provide factory-built vents and chimneys used for venting natural draft appliances complying with NFPA 211 and UL listed and labeled.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- D. Installer: Company specializing in performing Work of this Section with three years' experience.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Maintain water integrity of roof during and after installation of chimney or vent.

1.06 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication and indicate on Shop Drawings.

SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

1.07 WARRANTY

- A. Furnish five-year manufacturer's warranty for manufactured units.

PART 2 - PRODUCTS

2.01 TYPE B DOUBLE WALL GAS VENTS

- A. Manufacturers:

1. Duravent
2. Hart & Cooley
3. Ameri-vent
4. Approved equal

- B. Furnish materials according to New York State Standards.

1. Fabrication: Inner pipe of sheet aluminum, and outer pipe of galvanized sheet steel, tested in compliance with UL 441.
2. Vent Dampers: Mechanically actuated, same size as draft hood collar, constructed of stainless steel or galvanized steel, with corrosion-resistant components, in compliance with ANSI Z21.67.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Install concrete inserts for support of breeching, chimneys, and stacks in coordination with formwork.

3.02 INSTALLATION

- A. Install according to NFPA 54, SMACNA Guide for Steel Stack Construction.
- B. Coordinate installation of dampers, and induced draft fans.
- C. For Type B double wall gas vents, maintain UL listed minimum clearances from combustibles. Assemble pipe and accessories for complete installation.
- D. Install vent dampers, locating close to draft hood collar, and secured to breeching.
- E. Extend vent above roof according to applicable code.
- F. Maximum Vent Horizontal Distance: 75 percent of vent vertical distance.

SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

- G. Where appliance requires draft hood or barometric control device, install manufacturer furnished listed devices according to manufacturer's instructions and applicable code.

END OF SECTION

SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

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SECTION 235500 - FUEL-FIRED HEATERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Gas fired unit heaters.
- B. Related Sections:
 - 1. Section 231123 - Facility Natural-Gas Piping: Product requirements for natural gas piping connected to gas-fired heaters.

1.02 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI Z83.8 - Gas Unit Heaters.
- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- C. National Fire Protection Association:
 - 1. NFPA 54 - National Fuel Gas Code.
 - 2. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.
 - 3. NFPA 90B - Standard for the Installation of Warm Air Heating and Air Conditioning Systems.
 - 4. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittals procedures.
- B. Shop Drawings: Indicate assembly, required clearances, and locations and sizes of field connections.
- C. Product Data: Submit manufacturer's literature and data indicating rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
- D. Manufacturer's Installation Instructions: Submit Indicate rigging and assembly.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

SECTION 235500 - FUEL-FIRED HEATERS

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of thermostats or other products not mounted on unit.
- C. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listing.

1.05 QUALITY ASSURANCE

- A. Gas-Fired Unit Heater Performance Requirements: Conform to minimum efficiency prescribed by ASHRAE 90.1 when tested in accordance with ANSI Z83.8.
- B. Perform Work in accordance with New York State standards.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years' experience.

1.07 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Accept heaters and controls on site in factory packaging. Inspect for damage.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five-year manufacturer's warranty for heat exchanger.

SECTION 235500 - FUEL-FIRED HEATERS

1.11 EXTRA MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 - PRODUCTS

2.01 GAS FIRED UNIT HEATERS

- A. Manufacturers:
 - 1. Rexnor
 - 2. Modine
 - 3. Dayton
 - 4. Trane
 - 5. Substitutions: Approved equal.
- B. Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heat exchanger, burner, controls, and accessories:
 - 1. Heating fuel: Natural gas fired.
 - 2. Gas Control: Single stage.
 - 3. Ignition System: Electric direct ignition.
 - 4. Control Voltage: 24 volt, 60 hertz.
 - 5. Location: Suspended overhead.
- C. Cabinet: Galvanized steel, easily removed and secured access panels, insulated or double panel construction.
- D. Supply Fan: Axial type.
- E. Heat Exchanger: Aluminized steel welded construction.
- F. Gas Burner: Gravity vented or power vented.
- G. Gas Burner Safety Controls:
 - 1. Thermocouple sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
 - 2. Flame rollout switch: Installed on burner box and prevents operation.
 - 3. Vent safety shutoff sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
 - 4. Limit Control: Fixed stop at maximum permissible setting, de-energizes burner on excessive bonnet temperature, automatic reset.
- H. Controls:
 - 1. Room Thermostat: Adjustable, low voltage, to control burner operation, and supply fan to maintain temperature setting.

SECTION 235500 - FUEL-FIRED HEATERS

2. Supply Fan Control: Energize either from discharge temperature independent of burner controls or with timed off delay and timed on delay. Furnish manual switch for continuous fan operation.

I. Performance:

1. UH-1

- a. Air flow: 629 cfm.
- b. Motor: 0.06 hp.
- c. Heating Capacity:
 - 1) Heating output: 37,350 Btuh.
 - 2) Heating input: 45,000 Btuh.
 - 3) Annual fuel utilization efficiency (AFUE): 83 percent.
 - 4) Gas heating capacities are sea level ratings.

2. UH-2

- a. Air flow: 456 cfm.
- b. Motor: 0.06 hp.
- c. Heating Capacity:
 - 1) Heating output: 24,600 Btuh.
 - 2) Heating input: 30,000 Btuh.
 - 3) Annual fuel utilization efficiency (AFUE): 82 percent.
 - 4) Gas heating capacities are sea level ratings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify space is ready for installation of units and openings are as indicated on shop drawings.

3.02 INSTALLATION

- A. Install units in accordance with gas fired units to NFPA 54.
- B. Installation - Natural Gas Piping:
 1. Connect natural gas piping in accordance with NFPA 54.
 2. Connect natural gas piping to unit, full size of unit gas train inlet. Arrange piping with clearances for burner service.
 3. Install the following piping accessories on natural gas piping connections. Refer to Section 231123.
 - a. Strainer.
 - b. Pressure gage.
 - c. Shutoff valve.

SECTION 235500 - FUEL-FIRED HEATERS

- d. Pressure reducing valve.
- C. Install vent connections in accordance with NFPA 211. Install vents and stacks. Refer to Section 235100.
- D. Install unit heaters with vibration isolation. Hangar mount per manufacturer's recommendations.
- E. Provide hangers and supports for suspended units.
- F. Provide connection to electrical power systems. Refer to Section 260503.

END OF SECTION

SECTION 235500 - FUEL-FIRED HEATERS

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SECTION 238300 - RADIANT HEATING UNITS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes industrial grade heating cable, and temperature controllers for heating cable and mat.
- B. Related Sections:
 - 1. Section 031000 - Concrete Forming and Accessories: Execution requirements for inserts for wiring specified by this section.
 - 2. Section 260503 - Equipment Wiring Connections: Execution requirements for electric connections specified by this section.

1.02 PERFORMANCE REQUIREMENTS

- A. Snow Melting Installations: 40 W/sq ft, minimum, in protected areas.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate heating cable layout, locations of terminations, thermostats, and branch circuit connections.
- C. Product Data: Submit data for heating cable, and control components.
- D. Design Data: Indicate calculations demonstrating performance requirements are met.
- E. Manufacturer's Installation Instructions: Submit support details, and connection requirements.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of heating cable, temperature sensors, thermostats, and branch circuit connections.
- C. Operation and Maintenance Data: Submit description of controls and repair methods and parts list of components.

SECTION 238300 - RADIANT HEATING UNITS

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience approved by manufacturer.

1.06 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Accept cable on site in factory wrapping. Inspect for damage.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements.
- B. Maintain cable electric continuity during installation of concrete.

1.09 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

1.10 SEQUENCING

- A. Section 011000 - Summary: Work sequence.
- B. Sequence Work to prevent damage to heating system before concrete is poured or insulation installed.

1.11 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate Work with installation of concrete formwork and concrete placement.

SECTION 238300 - RADIANT HEATING UNITS

1.12 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish two year manufacturer warranty for floor-heating and snow-melting equipment.
- C. Correct defective Work within two year period after Date of Substantial Completion.

PART 2 - PRODUCTS

2.01 HEATING CABLE

- A. Manufacturers:
 - 1. Pentair Thermal, Electromelt.
 - 2. Danfoss, Inc.
 - 3. Orbit Manufacturing.
 - 4. Substitutions: Not Permitted.
- B. Furnish materials in accordance with State standards.
- C. Heating Cable: Thermoplastic-insulated, parallel resistance heating cable.
- D. Ratings: 30 Watts/lineal ft.
- E. Ratings: 40 Watts/sq ft.
- F. Install a redundant heating cable wired to a junction box for future use.

2.02 ACCESSORIES

- A. Thermostat: Dwyer Model 04-D.
- B. Install in metal conduit.
- C. Control Panel: Pentair Model C910 or equivalent.

2.03 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Electrical Characteristics: In accordance with Section 260503 and the following:
 - 1. 22 rated load amperes.
 - 2. 208 volts, single phase, 60 Hz.
 - 3. 30 amperes maximum circuit breaker size.

SECTION 238300 - RADIANT HEATING UNITS

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify concrete formwork is ready to receive Work.
- C. Verify field measurements are as shown on Drawings.
- D. Verify required utilities are available, in proper location, and ready for use.

3.02 INSTALLATION

- A. Avoid pinching and making sharp bends in cable.
- B. Prevent damage by sharp rocks, metal, or other objects during installation.
- C. Do not cross heating cable over itself.

3.03 INTERFACE WITH OTHER PRODUCTS

- A. Do not install heating cable across expansion or construction joints.

3.04 ERECTION TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Cable Spacing in Concrete: 3 inch centers, minimum; 9 inch centers, maximum.
- C. Depth in Concrete: 2 inches below finished surface.
- D. Bending Radius: Six times cable diameter, minimum.

3.05 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect for breaks in cable insulation.
- C. Test for continuity of heating cable.
- D. Measure insulation resistance to manufacturer's recommended values. Use test instruments in accordance with manufacturer's instructions.

SECTION 238300 - RADIANT HEATING UNITS

- E. Perform continuity and insulation resistance test on completed cable installation. For cables embedded in concrete, perform tests immediately before, during, and after concrete placement.
- F. Measure voltage and current at each unit.
- G. Submit written test report showing values measured on each test for each cable.

3.06 DEMONSTRATION AND TRAINING

- A. Demonstrate operation of heating cable controls.

END OF SECTION

SECTION 238300 - RADIANT HEATING UNITS

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DIVISION 26
ELECTRICAL

SECTION 260503 - EQUIPMENT WIRING CONNECTIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes electrical connections to equipment.
- B. Related Sections:
 - 1. Section 260519 - Low-Voltage Electrical Power Conductors and Cables.
 - 2. Section 260533 - Raceway and Boxes for Electrical Systems.

1.02 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA WD 1 - General Requirements for Wiring Devices.
 - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.
- B. National Fire Protection Association:
 - 1. NFPA 70-National Electrical Code

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
- C. Manufacturer's installation instructions.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Submittal procedures.
- B. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

1.05 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

SECTION 260503 - EQUIPMENT WIRING CONNECTIONS

- C. Determine connection locations and requirements.
- D. Sequence rough-in of electrical connections to coordinate with installation of equipment.
- E. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 - PRODUCTS

2.01 CORD AND PLUGS

- A. Attachment Plug Construction: Conform to NEMA WD 1.
- B. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.
- C. Cord Construction: Type SO SJO (as required) multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
- D. Cord Construction: Type SOOW SJOOW (as required) multiconductor flexible cord with identified equipment grounding conductor, suitable for use in wet locations.
- E. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.02 EXISTING WORK

- A. Remove exposed abandoned equipment wiring connections, including abandoned connections above accessible ceiling finishes.
- B. Disconnect abandoned utilization equipment and remove wiring connections. Remove abandoned components when connected raceway is abandoned and removed. Install blank cover for abandoned boxes and enclosures not removed.
- C. Extend existing equipment connections using materials and methods compatible with existing electrical installations, or as specified.

SECTION 260503 - EQUIPMENT WIRING CONNECTIONS

3.03 INSTALLATION

- A. Make electrical connections.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Install receptacle outlet to accommodate connection with attachment plug.
- E. Install cord and cap for field-supplied attachment plug.
- F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- H. Install terminal block jumpers to complete equipment wiring requirements.
- I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.
- J. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

3.04 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

SECTION 260503 - EQUIPMENT WIRING CONNECTIONS

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SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Removal of existing electrical equipment, wiring, and conduit in areas to be remodeled; removal of designated construction; dismantling, cutting and alterations for completion of the Work.
2. Disposal of materials.
3. Storage of removed materials.
4. Identification of utilities.
5. Salvaged items.
6. Protection of items to remain as scheduled at end of section.
7. Relocate existing equipment to accommodate construction.

1.02 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of capped utilities, conduits and equipment abandoned in place.

1.03 QUALITY ASSURANCE

- A. Perform Work in accordance with NFPA 70 (National Electric Code).

1.04 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum 2 weeks prior to commencing work of this section.

1.05 SEQUENCING

- A. Section 011000 - Summary: Requirements for sequencing.

1.06 SCHEDULING

- A. Section 013000 - Administrative Requirements and 013216 - Construction Progress Schedule: Requirements for scheduling.
- B. Schedule work to coincide with new construction and pump motor rehabilitation.

SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

- C. Perform noisy work:
 - 1. Between hours of 8:00 AM and 5:00 PM.
- D. Cease operations immediately when structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

1.07 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Conduct demolition to minimize interference with adjacent building areas.
- C. Coordinate demolition work with General Contractor, Engineer, and Owner's representative.
- D. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.
- E. Shut-down Periods:
 - 1. Arrange timing of shut-down periods of in service equipment with General Contractor, Engineer and Owner's representative. Do not shut down any utility without prior written approval.
 - 2. Keep shut-down period to minimum or use intermittent period as directed by General Contractor, Engineer and Owner's representative.
- F. Identify salvage items in cooperation with Owner.

PART 2 - PRODUCTS

2.01 Not Used

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify wiring and equipment indicated to be demolished serve only abandoned facilities.
- C. Verify termination points for demolished services.

SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

3.02 PREPARATION

- A. Erect, and maintain temporary safeguards, including warning signs and lights, barricades, and similar measures, for protection of the public, Owner, Contractor's employees, and existing improvements to remain.

3.03 DEMOLITION

- A. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Engineer before disturbing existing installation.
- B. Remove exposed abandoned conduit. Cut conduit flush with walls and floors, and patch surfaces.
- C. Remove conduit, wire, boxes, and fastening devices to avoid any interference with new installation.
- D. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- E. Reconnect equipment being disturbed by renovation work and required for continue service to the location indicated on drawings.
- F. Disconnect or shut off service to areas where electrical work is to be removed. Remove electrical fixtures, equipment, and related switches, outlets, conduit and wiring which are not part of final project.
- G. Perform work on energized equipment or circuits with experienced and trained personnel and only with prior written authorization from Engineer and Owner's representative.
- H. Remove, relocate, and extend existing installations to accommodate new construction.
- I. Repair adjacent construction and finishes damaged during demolition and extension work.
- J. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components. Cut embedded support elements flush with walls and floors.
- K. Clean and repair existing equipment to remain or to be reinstalled.
- L. Protect and retain power to existing active equipment remaining.
- M. Cap abandoned empty conduit at both ends.

3.04 EXISTING PANELBOARDS

- A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse. Install new breakers.
- B. Tag unused circuits as spare.

SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

- C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.
- D. Remove existing wire no longer in use from panel to equipment.
- E. Provide new updated typed directories.

3.05 SALVAGE ITEMS

- A. Remove and protect items indicated in Schedule to be salvaged and turn over to Owner.
- B. Items of salvageable value may be removed as work progresses. Transport salvaged items from site as they are removed.

3.06 REUSABLE ELECTRICAL EQUIPMENT

- A. Carefully remove equipment, materials, or fixtures which are to be reused.
- B. Disconnect, remove, or relocate existing electrical material and equipment interfering with new installation.

3.07 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Remove demolished materials as work progresses. Legally dispose.
- C. Keep workplace neat.

3.08 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

3.09 SCHEDULES

- A. Remove, store and protect the following materials and equipment:
 - 1. Raw Water Pump Motor Controllers (RVAT & VFD's)
 - 2. Ultrasonic Level Meters
 - 3. Cutler Hammer Digitrip Relay (from abandoned 5kV breaker)

SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

B. Protect the following materials and equipment remaining:

1. 480V switchboard and step down transformers
2. Pump motors
3. SCADA control cabinet
4. Outdoor substation
5. DC battery system for substation

END OF SECTION

SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

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SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes building wire and cable; metal clad cable; and wiring connectors and connections.
- B. Related Sections:
 - 1. Section 260553 - Identification for Electrical Systems: Product requirements for wire identification.

1.02 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.
 - 2. NFPA 262 - Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces.
- C. Underwriters Laboratories, Inc.:
 - 1. UL 1277 - Standard for Safety for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members.

1.03 SYSTEM DESCRIPTION

- A. Product Requirements: Provide products as follows:
 - 1. Stranded conductor for feeders and branch circuits 10 AWG and smaller.
 - 2. Stranded conductors for control circuits.
 - 3. Conductor not smaller than 12 AWG for power and lighting circuits.
 - 4. Conductor not smaller than 16 AWG for control circuits.
 - 5. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.
- B. Wiring Methods: Provide the following wiring methods:
 - 1. Concealed Dry Interior Locations: Use only building wire, Type THWN insulation, in raceway, armored cable or metal clad cable.
 - 2. Exposed Dry Interior Locations: Use only building wire, Type THWN insulation, in raceway.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

3. Wet or Damp Interior Locations: Use only building wire, Type THWN insulation, in raceway or metal clad cable.
4. Exterior Locations: Use only building wire, Type THWN insulation, in raceway.
5. Underground Locations: Use only building wire, Type THWN insulation, in raceway.

1.04 DESIGN REQUIREMENTS

- A. Conductor sizes are based on copper unless indicated as aluminum or "AL".
- B. When aluminum conductor is substituted for copper conductor, size to match circuit requirements, terminations, conductor ampacity and voltage drop.
- C. Aluminum conductor substitutions must be submitted to and approved by the Engineer prior to commencing work.

1.05 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit for building wire and each cable assembly type.
- C. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors.
- D. Test Reports: Indicate procedures and values obtained.

1.06 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of components and circuits.

1.07 QUALITY ASSURANCE

- A. Perform Work in accordance with NFPA 70 (National Electric Code).
- B. Maintain one copy of each document on site.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

1.09 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on Drawings.

1.10 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.
- C. Wire and cable routing indicated is approximate unless dimensioned.

PART 2 - PRODUCTS

2.01 BUILDING WIRE

- A. Product Description: Single conductor insulated wire.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.

2.02 METAL CLAD CABLE

- A. Conductor: Copper.
- B. Insulation Voltage Rating: 600 volts.
- C. Insulation Temperature Rating: 75 degrees C.
- D. Insulation Material: Thermoplastic.
- E. Armor Material: Steel.
- F. Armor Design: Corrugated tube.
- G. Jacket: PVC.

2.03 INDUSTRIAL INSTRUMENTATION AND CONTROL

- A. Product Description: A factory assembly of two or more insulated conductors, with or without shield, under a nonmetallic jacket NFPA 70 Type TC.
 - 1. All analog, RTD, communication or similar wiring shall be shielded.
- B. Conductor: Copper.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

- C. Overall Jacket: Polyvinyl Chlorine (PVC) in accordance with UL 1277.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation Temperature Rating: 90 degrees C.
- F. Listings: wire shall be listed by approved third party testing agency such as UL or CSA.

2.04 ETHERNET CABLE

- A. Product Description: An industrial grade multi-pair cable with overall shielding.
- B. Conductor: Copper.
- C. Overall Jacket: Polyvinyl Chloride (PVC).
- D. Insulation Voltage: 300 V or 600 V where applicable.
- E. Listings: Cable shall be listed by approved third party testing agency such as UL or CSA.

2.05 TERMINATIONS

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression type copper.
- B. Lugs for Wires 4 AWG and Larger: Color keyed, compression type copper, with insulating sealing collars.
- C. Tighten all screw, bolt, or similar connections with torque drive per manufacture's specifications.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify interior of building has been protected from weather.
- C. Verify mechanical work likely to damage wire and cable has been completed.
- D. Verify raceway installation is complete and supported.

3.02 PREPARATION

- A. Completely and thoroughly swab raceway before installing wire.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

3.03 EXISTING WORK

- A. Remove exposed abandoned wire and cable. Patch surfaces where removed cables pass through building finishes.
- B. Disconnect abandoned circuits and remove circuit wire and cable. Remove abandoned boxes when wire and cable servicing boxes is abandoned and removed. Install blank cover for abandoned boxes not removed.
- C. Provide access to existing wiring connections remaining active and requiring access. Modify installation or install access panel.
- D. Extend existing circuits using materials and methods compatible with existing electrical installations, or as specified.
- E. Clean and repair existing wire and cable remaining or wire and cable to be reinstalled.

3.04 INSTALLATION

- A. Route wire and cable to meet Project conditions.
- B. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- C. Identify and color code wire and cable under provisions of Section 260553. Identify each conductor with its circuit number or other designation indicated.
- D. Special Techniques--Building Wire in Raceway:
 - 1. Pull conductors into raceway at same time.
 - 2. Install building wire 4 AWG and larger with pulling equipment.
- E. Special Techniques - Cable:
 - 1. Protect exposed cable from damage.
 - 2. Support cables above accessible ceiling, using spring metal clips.
 - 3. Use suitable cable fittings and connectors.
- F. Special Techniques - Wiring Connections:
 - 1. Clean conductor surfaces before installing lugs and connectors.
 - 2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
 - 3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
 - 4. Install split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
 - 5. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
 - 6. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

7. Terminate aluminum conductors with tin-plated, aluminum-bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.
 8. Install suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
- G. Install stranded conductors for branch circuits 10 AWG and smaller. Install crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.
 - H. Install terminal lugs on ends of 600 volt wires unless lugs are furnished on connected device, such as circuit breakers.
 - I. Size lugs in accordance with manufacturer's recommendations terminating wire sizes. Install 2-hole type lugs to connect wires 4 AWG and larger to copper bus bars.
 - J. For terminal lugs fastened together such as on motors, transformers, and other apparatus, or when space between studs is small enough that lugs can turn and touch each other, insulate for dielectric strength of 2-1/2 times normal potential of circuit.

3.05 WIRE COLOR

- A. General:
 1. Install wire colors in accordance with the following:
 - a. Black and red for single phase circuits at 120/240 volts.
 - b. Black, red, and blue for circuits at 120/208 volts single or three phase.
 - c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
- B. Neutral Conductors: White (120V), Gray (277V). When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
- C. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded.
- D. Feeder Circuit Conductors: Uniquely color code each phase.
- E. Ground Conductors: Green

3.06 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Wire.
 - 2. Mechanical connectors.

1.02 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - 2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.
- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- C. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.

1.03 SYSTEM DESCRIPTION

- A. Grounding systems use the following elements as grounding electrodes:
 - 1. Existing Metal underground water pipe.
 - 2. Metal building frame.
 - 3. Existing grounding system.

1.04 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 5 ohms maximum.

1.05 QUALITY ASSURANCE

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.
- B. Perform Work in accordance with local codes and standards.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.
- D. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

PART 2 - PRODUCTS

2.01 WIRE

- A. Material: Stranded copper.
- B. Bonding Conductor: Copper conductor bare.

2.02 MECHANICAL CONNECTORS

- A. Manufacturers:
 - 1. Burndy
 - 2. ERICO International Corporation
 - 3. Harger Lightning and Grounding
 - 4. Or approved equal.
- B. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

3.02 PREPARATION

- A. Remove paint, rust, mill oils, surface contaminants at connection points.

3.03 EXISTING WORK

- A. Modify existing grounding system to maintain continuity to accommodate renovations.
- B. Extend existing grounding system using materials and methods compatible with existing electrical installations, or as specified.

3.04 INSTALLATION

- A. Install in accordance with IEEE 142 and 1100.
- B. Install grounding and bonding conductors concealed from view.
- C. Bond together reinforcing steel and metal accessories in structures.
- D. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- E. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
- F. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel.
- G. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits by means of grounding bushings on terminations at panelboards with installed number 12 conductor to grounding bus.
- H. Grounding electrical system using continuous metal raceway system enclosing circuit conductors in accordance with NEC.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- I. Permanently attach equipment and grounding conductors prior to energizing equipment.

3.05 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Grounding and Bonding: Perform inspections and tests listed in NETA ATS, Section 7.13.
- C. Perform continuity testing in accordance with IEEE 142.
- D. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Conduit supports.
2. Formed steel channel.
3. Spring steel clips.
4. Sleeves.
5. Mechanical sleeve seals.
6. Equipment bases and supports.

B. Related Sections:

1. Section 031500 - Concrete Anchoring.
2. Section 033000 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.

1.02 REFERENCES

A. National Fire Protection Association:

1. NFPA 70 - National Electrical Code.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data:

1. Hangers and Supports: Submit manufacturers catalog data including load capacity.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 2 - PRODUCTS

2.01 CONDUIT SUPPORTS

- A. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.
- B. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
- C. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- D. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.
- E. Cable Ties: High strength nylon temperature rated to 185 degrees F. Self locking.

2.02 FORMED STEEL CHANNEL

- A. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

2.03 SPRING STEEL CLIPS

- A. Product Description: Mounting hole and screw closure.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Do not drill or cut structural members.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

3.03 INSTALLATION - HANGERS AND SUPPORTS

A. Anchors and Fasteners:

1. Concrete Structural Elements: Provide, expansion anchors.
2. Steel Structural Elements: Provide beam clamps.
3. Concrete Surfaces: Provide Hilti-HY200 Anchoring System.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts.
5. Solid Masonry Walls: Provide Hilti-HY200 Anchoring System.
6. Sheet Metal: Provide sheet metal screws.
7. Wood Elements: Provide wood screws.

B. Install conduit and raceway support and spacing in accordance with NEC.

C. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.

D. Install multiple conduit runs on common hangers.

E. Supports:

1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install steel channel supports to stand cabinets and panelboards 1 inch off wall.
4. Support vertical conduit at every floor.

3.04 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment. Refer to Section 033000.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

3.05 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

3.06 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

3.07 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes conduit and tubing, outlet boxes, pull and junction boxes.
- B. Related Sections:
 - 1. Section 260503 - Equipment Wiring Connections.
 - 2. Section 260529 - Hangers and Supports for Electrical Systems.
 - 3. Section 260553 - Identification for Electrical Systems.

1.02 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
 - 2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
- B. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
 - 3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

1.03 SYSTEM DESCRIPTION

- A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground More than 5 feet outside Foundation Wall: Provide, thickwall nonmetallic conduit.
- C. Underground Within 5 feet from Foundation Wall: Provide rigid steel conduit.
- D. Outdoor Locations, Above Grade: Provide rigid steel conduit. Provide cast metal outlet boxes.
- E. Wet and Damp Locations: Provide rigid steel conduit. Provide cast metal outlet, junction, and pull boxes.
- F. Exposed Dry Locations: Provide rigid steel conduit. Provide sheet-metal boxes. Provide hinged enclosure for large pull boxes.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

1.04 DESIGN REQUIREMENTS

- A. Minimum Raceway Size: 3/4 inch unless otherwise specified.

1.05 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit for the following:
 - 1. Flexible metal conduit.
 - 2. Liquidtight flexible metal conduit.
 - 3. Nonmetallic conduit.
 - 4. Metallic conduit.
 - 5. Raceway fittings.
 - 6. Conduit bodies.
 - 7. Pull and junction boxes.
- C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.06 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents:
 - 1. Record actual routing of conduits larger than 2 inch.
 - 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- C. Protect PVC conduit from sunlight.

1.08 COORDINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate installation of outlet boxes for equipment connected under Section 260503.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 2 - PRODUCTS

2.01 METAL CONDUIT

- A. Rigid Steel Conduit: ANSI C80.1.
- B. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.02 FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction.
- B. Fittings: NEMA FB 1.

2.03 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Product Description: Interlocked steel construction with PVC jacket.
- B. Fittings: NEMA FB 1.

2.04 NONMETALLIC CONDUIT

- A. Product Description: NEMA TC 2; Schedule 80 PVC.
- B. Fittings and Conduit Bodies: NEMA TC 3.

2.05 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
 - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch male fixture studs where required.
 - 2. Concrete Ceiling Boxes: Concrete type.
- B. Cast Boxes: NEMA FB 1, Type FD, cast ferrous alloy. Furnish gasketed cover by box manufacturer.
- C. Wall Plates for Finished Areas: As specified in Section 262726.
- D. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.06 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.02 EXISTING WORK

- A. Remove exposed abandoned. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods compatible with existing electrical installations, or as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

3.03 INSTALLATION

- A. Ground and bond raceway and boxes.
- B. Fasten raceway and box supports to structure and finishes in accordance with Section 260529.
- C. Identify raceway and boxes in accordance with Section 260553.
- D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.04 INSTALLATION - RACEWAY

- A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
- B. Arrange raceway supports to prevent misalignment during wiring installation.
- C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 260529.
- E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
- F. Do not attach raceway to other piping systems.
- G. Construct wireway supports from steel channel specified in Section 260529.
- H. Route exposed raceway parallel and perpendicular to walls.
- I. Maintain clearance between raceway and piping for maintenance purposes.
- J. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
- K. Cut conduit square using saw or pipe cutter; de-burr cut ends.
- L. Bring conduit to shoulder of fittings; fasten securely.
- M. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
- N. Install conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations.
- O. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.
- P. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
- Q. Install fittings to accommodate expansion and deflection where raceway crosses, control and expansion joints.
- R. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
- S. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

3.05 INSTALLATION - BOXES

- A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings.
- B. Do not fasten boxes to other piping systems.
- C. Support boxes independently of conduit.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- D. Install gang box where more than one device is mounted together. Do not use sectional box.
- E. Install gang box with plaster ring for single device outlets.

3.06 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Install knockout closures in unused openings in boxes.

3.07 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Clean interior of boxes to remove dust, debris, and other material.
- C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Nameplates.
 - 2. Labels.
 - 3. Wire markers.
 - 4. Conduit markers.
 - 5. Stencils.

1.02 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data:
 - 1. Submit manufacturer's catalog literature for each product required.
 - 2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
- C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.03 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept identification products on site in original containers. Inspect for damage.
- C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
- B. Install labels only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.01 NAMEPLATES

- A. Product Description: Laminated three-layer plastic with engraved white letters on black contrasting background color.
- B. Letter Size:
 - 1. 1/4 inch high letters for identifying individual equipment and loads.
 - 2. 1/2 inch high letters for identifying grouped equipment and loads.
- C. Minimum nameplate thickness: 1/8 inch.

2.02 LABELS

- A. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background.

2.03 WIRE MARKERS

- A. Description: Cloth tape, split sleeve, or tubing type wire markers.
- B. Legend:
 - 1. Power and Lighting Circuits: Branch circuit or feeder number.
 - 2. Control Circuits: Control wire number as indicated on schematic and interconnection diagrams.

PART 3 - EXECUTION

3.01 PREPARATION

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

3.02 EXISTING WORK

- A. Install identification on existing equipment to remain in accordance with this section.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

3.03 INSTALLATION

- A. Install identifying devices after completion of painting.
- B. Nameplate Installation:
 - 1. Install nameplate parallel to equipment lines.
 - 2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
 - 3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
 - 4. Secure nameplate to equipment front using adhesive.
 - 5. Install nameplates for the following:
 - a. Motor Control Centers.
 - b. Panelboards and Switchboards.
 - c. Transformers.
 - d. Variable frequency drives.
- C. Label Installation:
 - 1. Install label parallel to equipment lines.
- D. Wire Marker Installation:
 - 1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes control cabinets, and each load connection.

END OF SECTION

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

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SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Distribution and branch circuit panelboards.
- B. Related Requirements:
 - 1. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 2. Section 260553 - Identification for Electrical Systems.
 - 3. Section 262813 - Fuses.

1.02 REFERENCE STANDARDS

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- B. National Electrical Manufacturers Association:
 - 1. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
 - 3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
 - 4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
 - 5. NEMA PB 1 - Panelboards.
 - 6. NEMA PB 1.1 - General Instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code.
- E. Underwriters Laboratories Inc.:
 - 1. UL 50 - Cabinets and Boxes
 - 2. UL 67 - Safety for Panelboards.

SECTION 262416 - PANELBOARDS

3. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.
4. UL 1449 - Transient Voltage Surge Suppressors.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit catalog data showing specified features of standard products.
- C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.
- C. Operation and Maintenance Data: Submit spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.05 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance products.
- B. Extra Stock Materials:
 1. Furnish two of each panelboard key. Panelboards keyed alike.

1.06 QUALITY ASSURANCE

- A. Qualifications
 1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

SECTION 262416 - PANELBOARDS

PART 2 - PRODUCTS

2.01 DISTRIBUTION PANELBOARDS

A. Manufacturers:

1. Eaton (Cutler-Hammer)
2. General Electric Company
3. Siemens Industry, Inc.
4. Square D
5. Substitutions: or approved equal.

B. Description: NEMA PB 1, circuit breaker type panelboard.

C. Materials:

1. Panelboard Bus: Copper with tin or silver plating, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.
2. Molded Case Circuit Breakers: UL 489, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.
3. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated on Drawings.
4. Surge Suppressers: Integrated in panelboard as indicated on drawings, refer to Seciton 263553.
5. Enclosure: NEMA PB 1, Type 12, 6 inches deep, 20 inches wide, cabinet box.
6. Cabinet Front: Surface type, fastened with concealed trim clamps or screws, hinged door with flush lock.

D. Finishes:

1. Manufacturer's standard gray enamel.

2.02 BRANCH CIRCUIT PANELBOARDS

A. Manufacturers:

1. General Electric Company
2. Siemens Industry, Inc.
3. Square D
4. Eaton (Cutler Hammer)
5. Substitutions: or approved equal.

B. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

C. Materials:

1. Panelboard Bus: Copper, current carrying components, ratings as indicated on Drawings. Furnish copper ground bus in each panelboard.

SECTION 262416 - PANELBOARDS

2. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 240 volt panelboards; 14,000 amperes rms symmetrical for 480 volt panelboards, unless indicated on Drawings.
 3. Molded Case Circuit Breakers: UL 489, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on Drawings. Do not use tandem circuit breakers.
 4. Enclosure: NEMA PB 1, Type 1.
 5. Cabinet Box: 6 inches deep, 20 inches wide.
- D. Cabinet Front: Flush cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock keyed alike. Finishes:
1. Finish in manufacturer's standard gray enamel.

2.03 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.

PART 3 - EXECUTION

3.01 DEMOLITION

- A. Disconnect abandoned panelboards. Install blank cover for abandoned panelboards.
- B. Maintain access to existing panelboard remaining active and requiring access. Modify installation or provide access panel.

3.02 INSTALLATION

- A. Install panelboards in accordance with NEMA PB 1.1.
- B. Install panelboards plumb.
- C. Install recessed panelboards flush with wall finishes.
- D. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.
- E. Install filler plates for unused spaces in panelboards.
- F. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads. Identify each circuit as to its clear, evident and specific purpose of use.
- G. Install engraved plastic nameplates in accordance with Section 260553.

SECTION 262416 - PANELBOARDS

- H. Ground and bond panelboard enclosure according to Section 260526. Connect equipment ground bars of panels in accordance with NFPA 70.

3.03 REPAIR

- A. Repair existing panelboards to remain or to be reinstalled.

3.04 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.
- D. Perform switch inspections and tests listed in NETA ATS, Section 7.5.
- E. Perform controller inspections and tests listed in NETA ATS, Section 7.16.1.

3.05 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.
- B. Measure steady state load currents at each panelboard feeder; rearrange circuits in panelboard to balance phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.

3.06 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean existing panelboards to remain or to be reinstalled.

END OF SECTION

SECTION 262416 - PANELBOARDS

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SECTION 262716 - ELECTRICAL CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Hinged cover enclosures.
2. Cabinets.
3. Terminal blocks.
4. Accessories.

B. Related Requirements:

1. Section 260526 - Grounding and Bonding for Electrical Systems.
2. Section 260529 - Hangers and Supports for Electrical Systems.
3. Section 260533 - Raceway and Boxes for Electrical Systems.

1.02 REFERENCE STANDARDS

A. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA ICS 4 - Industrial Control and Systems: Terminal Blocks.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit manufacturer's standard data for enclosures, cabinets, and terminal blocks.

C. Manufacturer's Instructions: Submit application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

D. Qualification Statements:

1. Submit fabricator, experience qualifications.

1.04 MAINTENANCE MATERIAL SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

SECTION 262716 - ELECTRICAL CABINETS AND ENCLOSURES

B. Extra Stock Materials:

1. Furnish two of each key.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

PART 2 - PRODUCTS

2.01 HINGED COVER ENCLOSURES

- A. Description: NEMA 250, Type 4X steel stainless steel enclosure.
1. Covers: Continuous hinge, held closed by hasp and staple for padlock.
 2. Furnish interior metal panel for mounting terminal blocks and electrical components; finish with white enamel.
 3. Enclosure Finish: Manufacturer's standard enamel.

2.02 CABINETS

- A. Description:
1. Boxes: Galvanized steel.
 2. Box Size: as indicated on Drawings.
 3. Backboard: Furnish backboard for mounting terminal blocks. Paint matte white.
 4. Fronts: Steel, surface type with concealed trim clamps or screw cover front, door with concealed hinge, and flush lock.
- B. Fabrication
1. Furnish metal barriers to form separate compartments wiring of different systems and voltages.
 2. Furnish accessory feet for free-standing equipment.
- C. Finishes:
1. Finish with gray baked enamel.

2.03 TERMINAL BLOCKS

- A. Description:
1. Terminal Blocks: NEMA ICS 4, finger safe construction.
 2. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.

SECTION 262716 - ELECTRICAL CABINETS AND ENCLOSURES

3. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.
4. Furnish ground bus terminal block, with each connector bonded to enclosure.

2.04 PLASTIC RACEWAY

- A. Description: Plastic channel with hinged or snap-on cover.

PART 3 - EXECUTION

3.01 DEMOLITION

- A. Remove abandoned cabinets and enclosures, including abandoned cabinets and enclosures above accessible ceiling finishes. Patch surfaces.
- B. Maintain access to existing cabinets and enclosures and other installations remaining active and requiring access. Modify installation or provide access panel.
- C. Extend existing cabinets and enclosures using materials and methods compatible with existing electrical installations, or as specified.

3.02 REPAIR

- A. Repair existing cabinets and enclosures to remain or to be reinstalled.

3.03 INSTALLATION

- A. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner in accordance with Section 260529.
- B. Install cabinet fronts plumb.

3.04 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Clean existing cabinets and enclosures to remain or to be reinstalled.
- C. Clean electrical parts to remove conductive and harmful materials.
- D. Remove dirt and debris from enclosure.
- E. Clean finishes and touch up damage.

END OF SECTION

SECTION 262716 - ELECTRICAL CABINETS AND ENCLOSURES

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SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes wall switches; receptacles; multioutlet assembly; and device plates.
- B. Related Sections:
 - 1. Section 260533 - Raceway and Boxes for Electrical Systems: Outlet boxes for wiring devices.

1.02 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA WD 1 - General Requirements for Wiring Devices.
 - 2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

PART 2 - PRODUCTS

2.01 WALL SWITCHES

- A. Product Description: NEMA WD 1, Heavy-Duty, AC only general-use snap switch.
- B. Body and Handle: Ivory plastic with toggle handle.
- C. Ratings:
 - 1. Voltage: 120 volts, AC.
 - 2. Current: 20 amperes.

2.02 RECEPTACLES

- A. Product Description: NEMA WD 1, Heavy-duty general use receptacle.
- B. Device Body: Ivory plastic.

SECTION 262726 - WIRING DEVICES

- C. Configuration: NEMA WD 6, type as indicated on Drawings.
- D. Convenience Receptacle: Type 5-20.
- E. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

2.03 WALL PLATES

- A. Decorative Cover Plate: 430 stainless steel.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify outlet boxes are installed at proper height.
- C. Verify wall openings are neatly cut and completely covered by wall plates.
- D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.02 PREPARATION

- A. Clean debris from outlet boxes.

3.03 EXISTING WORK

- A. Disconnect and remove abandoned wiring devices.
- B. Modify installation to maintain access to existing wiring devices to remain active.
- C. Clean and repair existing wiring devices to remain or to be reinstalled.

3.04 INSTALLATION

- A. Install devices plumb and level.
- B. Install switches with OFF position down.
- C. Install receptacles with grounding pole on top.
- D. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.

SECTION 262726 - WIRING DEVICES

- E. Install wall plates on flush mounted switches, receptacles, and blank outlets.
- F. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- G. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.
- H. Use jumbo size plates for outlets installed in masonry walls.
- I. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.05 INTERFACE WITH OTHER PRODUCTS

- A. Coordinate locations of outlet boxes provided under Section 260533 to obtain mounting heights as specified and as indicated on drawings.
- B. Install wall switch 48 inches above finished floor.
- C. Install convenience receptacle 48 inches above finished floor.

3.06 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

3.07 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Adjust devices and wall plates to be flush and level.

3.08 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Final cleaning.
- B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 262726 - WIRING DEVICES

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SECTION 262813 - FUSES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fuses.

1.02 REFERENCE STANDARDS

A. National Electrical Manufacturers Association:

1. NEMA FU 1 - Low Voltage Cartridge Fuses.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data sheets showing electrical characteristics, including time-current curves.

1.04 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual sizes, ratings, and locations of fuses.

1.05 MAINTENANCE MATERIALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials

B. Spare Parts:

1. Furnish two fuse pullers.

C. Extra Materials:

1. Furnish three spare fuses of each Class, size, and rating installed.

SECTION 262813 - FUSES

1.06 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers:

1. Cooper Bussman.
2. Mersen.
3. Little Fuse.
4. Substitutions: or approved equal.

2.02 FUSE PERFORMANCE REQUIREMENTS

- A. Main Service Switches Larger than 600 amperes: Class L (time delay).
- B. Main Service Switches: Class J (time delay).
- C. Power Load Feeder Switches Larger than 600 amperes: Class L (time delay).
- D. Power Load Feeder Switches: Class J (time delay).
- E. Motor Load Feeder Switches: Class J (time delay).
- F. Motor Branch Circuits: Class J (time delay).

2.03 FUSES

- A. Dimensions and Performance: NEMA FU 1, Class as specified or as indicated on Drawings.
- B. Voltage: Rating suitable for circuit phase-to-phase voltage.

PART 3 - EXECUTION

3.01 DOMOLITION

- A. Remove fuses from abandoned circuits.

SECTION 262813 - FUSES

- B. Maintain access to existing fuses and other installations remaining active and requiring access. Modify installation or provide access panel.

3.02 INSTALLATION

- A. Install fuse with label oriented so manufacturer, type, and size are easily read.

END OF SECTION

SECTION 262813 - FUSES

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SECTION 262816.13 - ENCLOSED CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes molded-case and insulated-case circuit breakers in individual enclosures.
- B. Related Sections:
 - 1. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 2. Section 260529 - Hangers and Supports for Electrical Systems.
 - 3. Section 260553 - Identification for Electrical Systems.

1.02 REFERENCES

- A. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- B. Underwriters Laboratories Inc.:
 - 1. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit catalog sheets showing ratings, trip units, time current curves, dimensions, and enclosure details.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations and continuous current ratings of enclosed circuit breakers.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

SECTION 262816.13 - ENCLOSED CIRCUIT BREAKERS

1.06 EXTRA MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.

PART 2 - PRODUCTS

2.01 MOLDED CASE CIRCUIT BREAKER

- A. Manufacturers:
 - 1. Square D
 - 2. Eaton (Cutler Hammer)
 - 3. Siemens
 - 4. Substitutions: or approved equal.
- B. Product Description: Enclosed, molded-case circuit breaker conforming to UL 489.
- C. Field-Adjustable Trip Circuit Breaker: Circuit breakers with frame sizes 200 amperes and larger have mechanism for adjusting long time short time continuous current setting for automatic operation.
- D. Field-Changeable Ampere Rating Circuit Breaker: Circuit breakers with frame sizes 200 amperes and larger have changeable trip units.
- E. Solid-State Circuit Breaker: Electronic sensing, timing, and tripping circuits for adjustable current settings; ground fault trip with; instantaneous trip; and adjustable short time trip.
- F. Accessories: Conform to UL 489.
 - 1. Handle Lock: Provisions for padlocking.
 - 2. Grounding Lug: In each enclosure.
- G. Enclosure: UL 489, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - 1. Interior Dry Locations: Type 1.
 - 2. Exterior Locations: Type 3R.

PART 3 - EXECUTION

3.01 EXISTING WORK

- A. Disconnect and remove abandoned enclosed circuit breakers.
- B. Maintain access to existing enclosed circuit breakers and other installations remaining active and requiring access. Modify installation or provide access panel.

SECTION 262816.13 - ENCLOSED CIRCUIT BREAKERS

- C. Clean and repair existing enclosed circuit breakers to remain or to be reinstalled.

3.02 INSTALLATION

- A. Install enclosed circuit breakers plumb. Provide supports in accordance with Section 260529.
- B. Height: 5 feet to operating handle.
- C. Install grounding and bonding in accordance with requirements of Section 260526.
- D. Locate and install engraved plastic nameplates in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.6.1.1.

3.04 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.
- B. Adjust trip settings to coordinate circuit breakers with other overcurrent protective devices in circuit.
- C. Adjust trip settings to provide adequate protection from overcurrent and fault currents.
- D. Engineer shall provide device settings to Contractor.

END OF SECTION

SECTION 262816.13 - ENCLOSED CIRCUIT BREAKERS

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SECTION 262819 - ENCLOSED SWITCHES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Fusible.
 - 2. Nonfusible switches.
- B. Related Requirements:
 - 1. Section 260529 - Hangers and Supports for Electrical Systems.
 - 2. Section 260553 - Identification for Electrical Systems.
 - 3. Section 262813 - Fuses.

1.02 REFERENCE STANDARDS

- A. National Electrical Manufacturers Association:
 - 1. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 2. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit switch ratings and enclosure dimensions.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of enclosed switches and ratings of installed fuses.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

SECTION 262819 - ENCLOSED SWITCHES

PART 2 - PRODUCTS

2.01 FUSIBLE SWITCH ASSEMBLIES

A. Manufacturers:

1. General Electric Company
2. Siemens
3. Square D
4. Cutler Hammer
5. Substitutions: or approved equal.

B. Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position.

C. Operation:

1. Switch Ratings
 - a. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
 - b. Short Circuit Current Rating: UL listed for 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses (30-600 ampere switches employing appropriate fuse rejection schemes). 200,000 rms symmetrical amperes when used with or protected by Class L fuses (800-1200 ampere).

D. Materials:

1. Fuse clips: Designed to accommodate NEMA FU 1, Class J fuses.
2. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel or stainless steel.
 - a. Interior Dry Locations: Type 1 Painted Steel.
 - b. Interior Wet Locations: Type 4X Stainless Steel.
 - c. Exterior Locations: Type 4X Stainless Steel.

2.02 NONFUSIBLE SWITCH ASSEMBLIES

A. Manufacturers:

1. General Electric Company
2. Siemens Power Transmission
3. Square D
4. Cutler Hammer
5. Substitutions: or approved equal.

SECTION 262819 - ENCLOSED SWITCHES

- B. Description: NEMA KS 1, Type HD, with externally operable handle interlocked to prevent opening front cover with switch in ON position enclosed load interrupter knife switch. Handle lockable in OFF position.
- C. Operation:
 - 1. Switch Ratings
 - a. Switch Rating: Horsepower rated for AC or DC as indicated on Drawings.
 - b. Short Circuit Current Rating: UL listed for 200,000 rms symmetrical amperes when used with or protected by Class R or Class J fuses (30-600 ampere switches employing appropriate fuse rejection schemes). 200,000 rms symmetrical amperes when used with or protected by Class L fuses (800-1200 ampere).
- D. Materials:
 - 1. Enclosure: NEMA KS 1, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel or stainless steel.
 - a. Interior Dry Locations: Type 1 Painted Steel.
 - b. Interior Wet Locations: Type 4X Stainless Steel.
 - 2. Service Entrance: Switches identified for use as service equipment are to be labeled for this application. Furnish solid neutral assembly and equipment ground bar.

PART 3 - EXECUTION

3.01 DEMOLITION

- A. Disconnect and remove abandoned enclosed switches.
- B. Maintain access to existing enclosed switches and other installations remaining active and requiring access. Modify installation or provide access panel.

3.02 INSTALLATION

- A. Install enclosed switches where indicated.
- B. Install enclosed switches plumb. Provide supports in accordance with Section 260529.
- C. Height: 5 feet to operating handle (indoors). 6 feet-7 inches to operating handle in highest position (outdoors).
- D. Install fuses for fusible disconnect switches. Refer to Section 262813 for product requirements.

SECTION 262819 - ENCLOSED SWITCHES

- E. Install engraved plastic nameplates in accordance with Section 260553. Engrave nameplates with the equipment served and the panel and circuit number supplying the switch.
- F. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.03 REPAIR

- A. Repair existing enclosed switches to remain or to be reinstalled....

3.04 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.5.

3.05 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Clean existing enclosed switches to remain or to be reinstalled.

END OF SECTION

SECTION 262913 - ENCLOSED CONTROLLERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes manual and magnetic motor controllers in individual enclosures.
- B. Related Sections:
 - 1. Section 262813 - Fuses.

1.02 REFERENCES

- A. National Electrical Manufacturers Association:
 - 1. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 2. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
 - 3. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
 - 4. NEMA ICS 6 - Industrial Control and Systems: Enclosures.
 - 5. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- B. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- C. Underwriters Laboratories Inc.:
 - 1. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, enclosure details, and wiring schematic.
- C. Test Reports: Indicate field test and inspection procedures and test results.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

SECTION 262913 - ENCLOSED CONTROLLERS

- B. Project Record Documents: Record actual locations and ratings of enclosed controllers.
- C. Operation and Maintenance Data: Submit Replacement parts list for controllers.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

PART 2 - PRODUCTS

2.01 FULL-VOLTAGE NON-REVERSING CONTROLLERS

- A. Manufacturers:
 - 1. Square D
 - 2. Eaton (Cutler Hammer)
 - 3. Siemens
 - 4. Substitutions: or approved equal.
- B. Product Description: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower.
- C. Control Voltage: 120 volts, 60 Hertz.
- D. Overload Relay: NEMA ICS 2; bimetal.
- E. Product Features:
 - 1. Auxiliary Contacts: NEMA ICS 2, 2 each field convertible contacts in addition to seal-in contact.
 - 2. Cover Mounted Pilot Devices: NEMA ICS 5, heavy duty oiltight type.
 - 3. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.
 - 4. Pushbuttons: Flush type.
 - 5. Indicating Lights: LED type.
 - 6. Selector Switches: Rotary type.
 - 7. Relays: NEMA ICS 2.
 - 8. Control Power Transformers: 120 volt secondary, 250 VA minimum, in each motor starter. Furnish fused primary and secondary, and bond unfused leg of secondary to enclosure.
- F. Combination Controllers: Combine motor controllers with disconnect in common enclosure, using thermal magnetic circuit breaker conforming to UL 489, with integral thermal and instantaneous magnetic trip in each pole.
- G. Enclosure: NEMA ICS 6, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
 - 1. Interior Dry Locations: Type 1.

SECTION 262913 - ENCLOSED CONTROLLERS

2.02 FULL-VOLTAGE REVERSING CONTROLLERS

A. Manufacturers:

1. Square D
2. Eaton (Cutler Hammer)
3. Siemens
4. Substitutions: or approved equal.

B. Product Description: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower. Include electrical interlock between FORWARD and REVERSE rotation.

C. Control Voltage: 120 volts, 60 Hertz.

D. Overload Relay: NEMA ICS 2; bimetal.

E. Product Features:

1. Auxiliary Contacts: NEMA ICS 2, 2 each field convertible contacts in addition to seal-in contact.
2. Cover Mounted Pilot Devices: NEMA ICS 5, heavy duty oiltight type.
3. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.
4. Pushbuttons: Flush type.
5. Indicating Lights: LED type.
6. Selector Switches: Rotary type.
7. Relays: NEMA ICS 2,.
8. Control Power Transformers: 120 volt secondary, 250 VA minimum, in each motor starter. Furnish fused primary and secondary, and bond unfused leg of secondary to enclosure.

F. Combination Controllers: Combine motor controllers with disconnect in common enclosure, using thermal magnetic circuit breaker conforming to UL 489, with integral thermal and instantaneous magnetic trip in each pole.

G. Enclosure: NEMA ICS 6, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.

1. Interior Dry Locations: Type 1.
2. Exterior Locations: Type 3R.
3. Wet/Damp Locations: Type 4X (stainless steel).

PART 3 - EXECUTION

3.01 EXISTING WORK

A. Disconnect and remove abandoned enclosed motor controllers.

B. Maintain access to existing enclosed motor controllers and other installations to remain active and to require access. Modify installation or provide access panel.

SECTION 262913 - ENCLOSED CONTROLLERS

- C. Clean and repair existing enclosed motor controllers to remain or to be reinstalled.

3.02 INSTALLATION

- A. Install enclosed controllers plumb. Provide supports in accordance with Section 260529.
- B. Height: 5 feet to operating handle.
- C. Install fuses for fusible switches. Refer to Section 262813 for product requirements.
- D. Select and install overload heater elements in motor controllers to match installed motor characteristics.
- E. Install engraved plastic nameplates. Refer to Section 260553 for product requirements and location.
- F. Neatly type label and place inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating. Place label in clear plastic holder.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.16.1.

END OF SECTION

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes variable frequency controllers.
- B. Related Sections:
 - 1. Section 260553 – Identification for Electrical Systems.
 - 2. Section 262813 - Fuses.

1.02 REFERENCES

- A. Institute of Electrical and Electronics Engineers:
 - 1. IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
 - 2. IEEE 519 – Recommended Practice and Requirements for Harmonic Control in Electric Power Systems.
- B. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
 - 2. NEMA FU 1 - Low Voltage Cartridge Fuses.
 - 3. NEMA ICS 7 - Industrial Control and Systems: Adjustable Speed Drives.
 - 4. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation, and Operation of Adjustable Speed Drive Systems.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; nameplate legends; and wiring schematic.
- C. Product Data: Submit catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, enclosure details, Modbus TCP/IP mapping, and all components.
- D. Test Reports: Indicate field test and inspection procedures and test results.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

- E. Manufacturer's Field Reports: Indicate start-up inspection findings.
- F. Controller Program settings for review by Engineer and Owner.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit instructions complying with NEMA ICS 7.1. Include procedures for starting and operating controllers, and describe operating limits possibly resulting in hazardous or unsafe conditions. Include routine preventive maintenance schedule.
- C. Record Drawings and Final Controller Program Settings.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years experience, and with service facilities within 250 miles of project.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Product storage and handling requirements.
- B. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided. Handle carefully to avoid damage to components, enclosure, and finish.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements.
- B. Conform to NEMA ICS 7 service conditions during and after installation of variable frequency controllers.

1.08 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish two year manufacturer warranty for variable frequency controller.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

1.09 MAINTENANCE SERVICE

- A. Section 017000 - Execution and Closeout Requirements: Maintenance service.
- B. Furnish service and maintenance of variable frequency controller for one year from Date of Substantial Completion.

1.10 MAINTENANCE MATERIALS

- A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.
- B. Furnish two of each air filter.
- C. Furnish one space blower and fan for each drive.

PART 2 - PRODUCTS

2.01 VARIABLE FREQUENCY CONTROLLER

- A. Manufacturers:
 - 1. Toshiba W7.
 - 2. Square D Altivar ATV 600.
 - 3. Siemens Sinamic W.
 - 4. Substitutions: No substitutions permitted.
- B. Product Description: NEMA ICS 7, enclosed variable frequency controller suitable for operating indicated loads. Select unspecified features and options in accordance with NEMA ICS 7.1.
- C. Ratings:
 - 1. Rated Input Voltage: 480, three phase, 60 Hertz.
 - 2. Rated SCCR: 65kA Sym.
 - 3. Motor Nameplate Voltage: 460, three phase, 60 Hertz.
 - 4. Motor Nameplate Full Load Amps: 512.
 - 5. Motor Service Factor: 1.15.
 - 6. Displacement Power Factor: Between 1.0 and 0.95, lagging, over entire range of operating speed and load.
 - 7. Operating Ambient: 0 degrees C to 40 degrees C.
 - 8. Overload Current
 - a. Normal duty, variable torque, capable of 110% overcurrent for 60 seconds.
- D. Design Features:
 - 1. Employ microprocessor-based inverter logic isolated from power circuits.
 - 2. Employ pulse-width-modulated inverter system.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

3. Design for ability to operate controller with motor disconnected from output.
 4. Design to attempt five automatic restarts following fault condition before locking out and requiring manual restart.
- E. Indicators and Manual Controls:
1. Input Signal: ModBus TCP/IP.
 2. Display: Furnish integral HMI digital display to indicate output voltage, output frequency, and output current.
 3. Status Indicators: Separate indicators for running, stopped, fault, check valve open, check valve closed, seal water flow, and input power ON.
 4. Current Limit Adjustment: 60 - 110 percent of rated.
 5. Acceleration Rate Adjustment: 0.5 - 30 seconds.
 6. Deceleration Rate Adjustment: Coast to Stop.
 7. HAND-OFF-AUTOMATIC selector switch
 8. Manual speed control (via HMI).
 9. Control Power Source: Integral control transformer.
 10. Door mounted HMI and Program Port.
- F. Safeties and Interlocks:
1. Door Interlocks: Mechanical means to prevent opening of equipment with power connected, or to disconnect power when door is opened; include means for defeating interlock by qualified persons.
 2. Emergency Stop: Where indicated on the plans.
 3. Disconnecting Means: Integral circuit breaker on line side of each controller.
- G. Fabrication:
1. Wiring Terminations: Match conductor materials and sizes as indicated on Drawings.
 2. Enclosure: NEMA 250, Type 1, suitable for equipment application in places accessible only to qualified personnel.
 3. Finish: Manufacturer's standard enamel.
 4. Refer to plans for dimensions and conduit entry locations.
- H. Accessories:
1. Include 5% input line reactor.
 2. Include 3% output load reactor.
 3. Include 18-pulse phase shifting auto-transformer and DC rectifier.
 4. RTD input module for eight (8), 3-wire, 100 PT RTD's.
 5. Modbus TCP/IP communications.
- I. Refer to plans for additional information.

2.02 SOURCE QUALITY CONTROL

- A. Shop inspect and perform standard productions tests for each controller.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify building environment is maintained within service conditions required by manufacturer.

3.02 EXISTING WORK

- A. Disconnect and remove abandoned controllers.
- B. Clean and repair existing controllers to remain or to be reinstalled.

3.03 INSTALLATION

- A. Install in accordance with NEMA ICS 7.1.
- B. Tighten accessible connections and mechanical fasteners after placing controller.
- C. Program, commission, and test each controller.
- D. Install engraved plastic nameplates in accordance with Section 260553.
- E. Neatly type label inside controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating. Place label in clear plastic holder.
- F. Ground and bond controller.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.16 and NEMA ICS 7.1.

3.05 MANUFACTURER'S FIELD SERVICES

- A. Section 014000 - Quality Requirements: Manufacturer's field services.
- B. Prepare and startup variable frequency controller.

SECTION 262923 - VARIABLE-FREQUENCY MOTOR CONTROLLERS

3.06 DEMONSTRATION AND TRAINING

- A. Furnish 4 hours of instruction each for two persons (eight hours total), to be conducted at project site with manufacturer's representative.

END OF SECTION

DIVISION 31
EARTHWORK

SECTION 310516 - AGGREGATES FOR EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Coarse aggregate materials.
2. Fine aggregate materials.

B. Related Sections:

1. Section 312316 – Excavation.
2. Section 312323 - Fill.
3. Section 334600 - Subdrainage: Filter aggregate.
4. Geotechnical report; bore hole locations and findings of subsurface materials.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
5. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Submit name of imported materials suppliers.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

SECTION 310516 - AGGREGATES FOR EARTHWORK

1.04 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Perform Work in accordance with NYSDOT Standard Specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Course Aggregate:

- 1. Type A1: NYSDOT subbase course Type 2 for use in backfilling under pavement. Subbase course type 2 shall conform to requirements of NYSDOT material designation section 733-04 and have the following gradation by weight.

<u>% Passing</u>	<u>Sieve</u>
100	2 - inch
25 - 60	¼ - inch
5 - 40	No. 40
0 - 10	No. 200

B. Select Structural Fill:

- 1. Type A2: NYSDOT select structural fill for use in backfilling around structures. Structural fill shall conform to requirements of NYSDOT material designation section 733-14 and have the following gradation by weight.

<u>% Passing</u>	<u>Sieve</u>
100	4 -inch
0 - 70	No. 40
0 - 15	No. 200

C. Subdrainage Filter Aggregate and Bedding:

- 1. Type A3: NYSDOT underdrain filter type II for use in backfilling under subdrainage pipe. Underdrain filter type 2 shall conform to requirements of NYSDOT material designation 733-20 and have the following gradation by weight.

<u>% Passing</u>	<u>Sieve</u>
100	½ inch
20 - 100	¼ inch
0 - 15	No. 10
0 - 5	No. 20

- D. Follow NYSDOT Standard Specifications if gradation data varies from those listed above.

SECTION 310516 - AGGREGATES FOR EARTHWORK

- E. Recycled concrete or asphalt pavement shall not be allowed.
- F. Slag of any type shall not be allowed.

2.02 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing and inspection services.
- B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698, ASTM D1557, ASTM D4318, ASTM C136.
- C. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698, ASTM D1557, ASTM D4318, ASTM C136.
- D. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 - EXECUTION

3.01 STOCKPILING

- A. Stockpile materials on site at locations designated by Owner.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.
- E. Stockpile unsuitable materials on impervious material and cover to prevent erosion and leaching, until disposed of.

3.02 STOCKPILE CLEANUP

- A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 310516 - AGGREGATES FOR EARTHWORK

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SECTION 310517 – SELECT GRANULAR MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

Select granular materials shall be used in bedding, pipe encasement, or backfill and as specified or as directed by the ENGINEER.

B. Related Work Specified Elsewhere

1. Section 312318 - Rock Removal
2. Section 312317 - Excavation, Backfill and Trenching
3. Section 331100 - Buried Piping Installation

1.02 QUALITY ASSURANCE

A. Reference Standards

1. NYSDOT Standards, latest revision

1.03 SUBMITTALS

- A. The CONTRACTOR shall furnish representative samples, sieve analysis and certification of specification compliance for the select granular materials to the ENGINEER and advise on the location of the source.
- B. The CONTRACTOR shall submit copies of proposed materials, methods and operations of backfilling and compaction to the ENGINEER for review prior to the start of work. A list of equipment to be used in CONTRACTOR'S Methods and Operations must be included.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Bedding and Pipe Encasement

1. NYSDOT No. 2A Crushed Stone – bedding for DIP and PCCP watermain.

Shall be a No. 1 and No. 2 blend, thoroughly washed, clean, sound, tough, hard, crushed limestone conforming to the requirements of NYSDOT Item No. 703.0201 or crushed gravel conforming to the requirements of NYSDOT Item No. 703.0202, having the following gradation by weight:

SECTION 310517 – SELECT GRANULAR MATERIALS

<u>% Passing</u>	<u>Sieve</u>
100	1- $\frac{1}{2}$ -inch
93-100	1-inch
27-58	$\frac{1}{2}$ -inch
0-8	$\frac{1}{4}$ -inch

2. NYSDOT Concrete Sand – bedding for copper and polyethylene tubing. Washed, fine aggregate sand shall conform to the requirements of NYSDOT Item No. 703.07, having the following gradation by weight:

<u>% Passing</u>	<u>Sieve</u>
100	$\frac{3}{8}$ -inch
90 - 100	No. 4
75 - 100	No. 8
50 - 85	No. 16
25 - 60	No. 30
10 - 30	No. 50
1 - 10	No. 100
0 - 3	No. 200

B. Select Backfill

1. NYSDOT Subbase Type 2 Crusher Run Stone or Crusher Run Gravel. Material shall conform to the requirements of NYSDOT Item No. 304.12, having the following gradation by weight:

<u>% Passing</u>	<u>Sieve</u>
100	2-inch
25 - 60	$\frac{1}{4}$ -inch
5 - 40	No. 40
0 - 10	No. 200

C. Peagravel

1. NYSDOT Type 1A Screened Gravel for the annular space between the carrier pipe and the casing pipe. Screened gravel shall conform to the requirements of NYSDOT Item No. 703.0203 and have the following gradation by weight:

<u>% Passing</u>	<u>Sieve</u>
100	$\frac{1}{2}$ -inch
90 - 100	$\frac{1}{4}$ -inch
0 - 15	$\frac{1}{8}$ -inch

- D. Follow NYSDOT Standard Specifications if gradation data varies from those listed above.

SECTION 310517 – SELECT GRANULAR MATERIALS

- E. Recycled concrete or asphalt pavement shall not be allowed.
- F. Slag of any type shall not be allowed.
- G. Flowable fill shall not be allowed.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General
 - 1. Select granular material as specified or directed for watermain bedding or encasement shall be placed in accordance with Section 312317 - Excavation, Backfill and Trenching and Section 331100 - Buried Piping Installation.
 - 2. Select backfill where specified or directed shall be placed in accordance with the backfilling provisions of Section 312317 - Excavation, Backfill & Trenching.

3.02 DISPOSAL OF DISPLACED MATERIALS

- A. Materials displaced through the use of the above materials shall be wasted or disposed of by the CONTRACTOR and the cost of such disposal shall be included in the appropriate bid item.

END OF SECTION

SECTION 310517 – SELECT GRANULAR MATERIALS

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SECTION 310813 - PILE LOAD TESTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Pile load testing.
2. Documented test results.

B. Related Sections:

1. Section 312316 - Excavation: Excavating to working and test equipment level.
2. Section 316216 - Steel Piles.

1.02 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Additional Tests:

1. Basis of Measurement: Each additional test pile.
2. Basis of Payment: Includes set-up, applying test load, test equipment, monitoring, reporting results.

1.03 REFERENCES

A. ASTM International:

1. ASTM D1143 - Standard Test Method for Piles Under Static Axial Compressive Load.
2. ASTM D3689 - Standard Test Methods for Deep Foundations Under Static Axial Tensile Load.
3. ASTM D4945 - Standard Test Method for High-Strain Dynamic Testing of Piles.

1.04 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate test method and equipment, load type, calibration equipment.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with the following:

1. Compressive Load Tests: ASTM D4945.
2. Uplift Load Tests: ASTM D3689.

B. Perform Work in accordance with State of NY Building Code.

SECTION 310813 - PILE LOAD TESTING

- C. Maintain one copy of each document on site.

1.06 QUALIFICATIONS

- A. Monitor test pile placement and elevations under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of New York.

1.07 SEQUENCING

- A. Section 011000 - Summary: Requirements for sequencing.

PART 2 - PRODUCTS

2.01 EQUIPMENT

- A. Equipment Type, Load Carrying Device, Load, and Instrumentation: Conform to ASTM D4945 of same type as will be used for pile placement of the Work.
- B. Quantity: Provide one test crib for pile load testing.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify site conditions will support cribbing and load for testing purposes.

3.02 PREPARATION

- A. Establish stable working elevation for test equipment.

3.03 TESTING

- A. Perform load tests.
- B. Load Test The Following:
 - 1. Test 2 indicator piles at locations as directed by Engineer.
- C. Subject piles to 2 times design load.
- D. Acceptable Permanent Set of Piles After Load Testing: 1/8 inch.

SECTION 310813 - PILE LOAD TESTING

- E. When tested piles do not conform to requirements, perform additional testing of other piles.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Field testing requirements.
- B. Section 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- C. An independent inspection firm will be engaged to observe and document test method and results.
- D. Document test equipment used, method of calibration and recording, test results, recommendations or modification of piling method used.
- E. Accurately record actual dimensions and locations of tested piles and movement or distortion caused by testing.

3.05 EQUIPMENT REMOVAL

- A. Remove test and temporary load equipment from site.

END OF SECTION

SECTION 310813 - PILE LOAD TESTING

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SECTION 312316 - EXCAVATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Soil densification.
2. Excavating for building foundations.
3. Excavating for parking areas.
4. Excavating for slabs-on-grade.
5. Excavating for site structures.

B. Related Sections:

1. Section 310516 - Aggregates for Earthwork: Stockpiling excavated materials.
2. Section 312318 - Rock Removal: Removal of rock during excavating.
3. Geotechnical report; bore hole locations and findings of subsurface materials.

1.02 REFERENCES

- A. Local utility standards when working within 24 inches of utility lines.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.
- C. Shop Drawings: Indicate soil densification grid for each size and configuration footing requiring soils densification.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with NYSDOT Standard Specifications.

SECTION 312316 - EXCAVATION

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 PREPARATION

- A. Call Dig Safely New York at 1-800-962-8962 not less than five working days before performing Work.
 - 1. Request underground utilities to be located and marked within and surrounding construction areas.
- B. Identify required lines, levels, contours, and datum.
- C. Protect utilities indicated to remain from damage.
- D. Protect plant life, lawns, and other features remaining as portion of final landscaping.
- E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.02 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation work.
- B. Excavate subsoil to accommodate building foundations, slabs-on-grade paving site structures, and construction operations.
- C. Compact disturbed load bearing soil in direct contact with foundations to original bearing capacity; perform compaction in accordance with Section 312323.
- D. Slope and/or shore banks as per minimum statutory/regulatory requirements for a safe work site.
- E. Do not interfere with 45 degree bearing splay of foundations.
- F. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- G. Trim excavation. Remove loose matter.
- H. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume. Remove larger material as specified in Section 312323.
- I. Notify Engineer of unexpected subsurface conditions.
- J. Correct areas over excavated as directed by Engineer.

SECTION 312316 - EXCAVATION

- K. Stockpile subsoil in area designated on site to depth not exceeding 8 feet and protect from erosion.
- L. Repair or replace items indicated to remain damaged by excavation.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements.
- B. Perform inspection of excavation and controlled fill operations in accordance with applicable code.
- C. Obtain visual inspection of bearing surfaces by qualified geotechnical firm before installing subsequent work.

3.04 PROTECTION

- A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.
- C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

END OF SECTION

SECTION 312316 - EXCAVATION

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SECTION 312317 – EXCAVATION, BACKFILL, AND TRENCHING

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. The CONTRACTOR shall furnish all labor, materials, equipment, and incidentals necessary for excavation, trenching, backfill, and compaction as shown and specified for waterline installation. Disposal of excess and unsuitable excavated material is included.
2. Backfill of excavations with acceptable materials as specified in other Sections.

B. Related Work Specified Elsewhere

1. Section 310517 - Select Granular Materials
2. Section 3123165 – Rock Removal
3. Section 331100 - Buried Piping Installation

1.02 QUALITY ASSURANCE

A. Reference Standards

1. ASTM A36, Structural Steel
2. ASTM A328, Steel Sheet Piling
3. ASTM D422, Particle-Size Analysis of Soils
4. ASTM D698, Moisture-Density Relations of Soils, using 5.5 lb. Rammer and 12-inch Drop
5. ASTM D1556, Density of Soil in Place by the Sand-Cone Method
6. ASTM D1557, Moisture-Density Relations of Soils, using 10 lb. Rammer and 18-inch Drop
7. ASTM D2321, Recommended Practices for Underground Installation of Pipe for Sewers and Other Gravity Flow Applications
8. ASTM D2922, Density of Soil and Soil-Aggregate in Place by Nuclear Method (Shallow Depth)
9. AISC Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings
10. Occupational Safety and Health Administration (OSHA) Regulations
11. Industrial Code Rule 23

1.03 SUBMITTALS

- ##### A.
- Before any excavation begins, the CONTRACTOR shall obtain all permits and licenses required by governing authorities having jurisdiction and submit certified copies to ENGINEER prior to work being performed.

SECTION 312317 – EXCAVATION, BACKFILL, AND TRENCHING

- B. The CONTRACTOR shall submit drawings submitted with a PE stamp, for information only, for the following items as required:
1. Sheeting, shoring and bracing
 2. Dewatering systems
 3. Cofferdams
 4. Additional protection systems required
 5. Underpinning
 6. Underdraining
 7. Sediment and Erosion control
 8. Boring and Receiving Pits.
- C. The CONTRACTOR shall submit proposed materials, methods and operations of backfilling and compaction to the ENGINEER for review prior to the start of work. A list of equipment to be used in CONTRACTOR'S methods and operations must be included.
- D. All drawings shall be prepared and sealed by an independent professional engineer recognized as an expert in the specialty involved and licensed to practice in the State of New York. The drawings shall be submitted to the ENGINEER to establish compliance with the terms of the Contract Documents. Calculations shall not be submitted. Drawing submissions will not be checked and will not imply approval by the ENGINEER of the work involved. CONTRACTOR shall be wholly responsible for designing, installing, and operating whatever system is necessary to accomplish satisfactory sheeting, bracing, protection, underpinning, and dewatering.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Bedding and Select Backfill
1. Bedding and select backfill material shall be in accordance with Section 310517 - Select Granular Materials.
- B. Backfill and Fill Materials
1. Excavated materials may be used for backfill provided:
 - a. Material is sandy, loamy or similar to bank run gravel.
 - b. Material is free of debris, hazardous materials, frozen materials, organic or other deleterious materials. Material greater than 4-inches in any direction is unacceptable. Material greater than 2-inches in any direction is unacceptable for backfill directly against the watermain.
 - c. Maximum dry density and optimum moisture content are determined in accordance with the above.
 - d. Material is reviewed and deemed acceptable by the ENGINEER.

SECTION 312317 – EXCAVATION, BACKFILL, AND TRENCHING

2. Use select granular backfill within 5 feet or within a 1 on 1 slope from the trench to the edge of pavement of all roadways.
- C. Topsoil
1. Topsoil shall be furnished and installed in conformance with New York State Department of Transportation Standard Specifications.
- D. Explosives
1. Explosives are not allowed to be used nor allowed on site.
- E. Sheeting, Shoring & Bracing
1. Used material shall be in good condition, not damaged or excessively pitted. Unless otherwise specified, all sheeting to remain in place shall be new. New or used sheeting may be used for temporary work.
 2. All timber used for breast boards (lagging) shall be new or used, meeting the requirements for Douglas Fir Dense Construction grade or Southern Pine No. 2 Dense S3. Where close or tight sheeting is required, wood sheeting shall be tongued and grooved.
 3. All steel work for sheeting, shoring, bracing, cofferdams, etc. shall be designed in accordance with the provisions of the “Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings”, of the AISC except that field welding will be permitted.
 4. Steel sheet piling shall be manufactured from steel conforming to ASTM A328. Steel soldier piles, wales and braces shall be new or used and shall conform to ASTM A36.
 5. Steel sheeting shall have a minimum thickness of $\frac{3}{8}$ -inch in web, unless otherwise specified.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The CONTRACTOR shall provide the ENGINEER with sufficient time and means to examine the areas and conditions under which excavating, filling and grading are to be performed. The CONTRACTOR shall notify the ENGINEER of conditions detrimental to the proper and timely completion of work. The CONTRACTOR shall not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

3.02 TEST PITS

- A. Where shown or ordered by the ENGINEER, the CONTRACTOR shall excavate and backfill test pits in advance of construction to determine conditions or location of existing

SECTION 312317 – EXCAVATION, BACKFILL, AND TRENCHING

facilities. The CONTRACTOR shall perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling and restoring the surface for the test pits.

- B. Test pits which the CONTRACTOR excavates that are not shown on the Drawings or specified or ordered shall be at the CONTRACTOR'S expense.
- C. No test pits will be dug prior to utility company stakeout.
- D. Cold patch for temporary repair shall be placed as directed by the ENGINEER.

3.03 EROSION CONTROL

- A. All necessary precautions shall be taken to preclude the contamination of any wetland or waterway by suspended solids, sediment, fuels, solvents, lubricants, epoxy coatings, paints, concrete leachate or any other environmentally deleterious substance associated with the project.
- B. All necessary precautions shall be taken to prevent the entry of raw concrete or concrete liquors into the waters and/or wetlands of the State of New York. Equipment washwater from this project shall not be allowed to enter any waterway or wetland.
- C. All sediments are to be retained on the project site through the use of hay bales, silt fences or other barriers, as specified or approved by the local authority having jurisdiction, to prevent erosion.
- D. All areas of soil disturbance resulting from this project shall be seeded with an appropriate perennial grass seed and mulched with hay or straw within one week of final grading. Mulch shall be maintained until a suitable vegetative cover has been established.
- E. Pumped groundwater collected from excavations shall not be allowed to be discharged directly to any wetland, waterway, or other water body.
- F. Contamination of any wetland, waterway, or other water body shall be cleaned and/or restored to the satisfaction of the ENGINEER and governing authorities at the expense of the CONTRACTOR.

3.04 EXCAVATION

- A. The CONTRACTOR shall perform all excavation required to complete the work as shown and specified. Excavations shall include earth, sand, clay, gravel, hardpan, boulders and ledge rock, decomposed rock, pavements, rubbish and all other materials within the excavation limits, except rock. Where the excavation is in rock meeting the definition in Section 312318 - Rock Removal (requiring drilling, jack-hammering and hand removal), the rock shall be removed as specified in Section 312318.

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- B. Excavations for pipelines, utilities and structures shall be open excavations, shored and braced where necessary, according to OSHA standards, to prevent possible injury to workmen and to new and existing structures or pipelines.
- C. Where the pipeline, utility or structure is to be placed below the ground water table, well-points, cofferdams or other acceptable methods shall be used to permit construction under dry conditions. Dry conditions shall prevail until concrete has reached sufficient strength to withstand earth and hydrostatic loads and until the pipelines are properly jointed, tested and backfilled.
- D. Pumping in excavations shall be done in such a manner so as to prevent damage to the existing subgrade, and to prevent the carrying away of unconsolidated concrete materials.
- E. Excavations for pipelines shall be made sufficiently wide to permit proper laying and jointing of the pipe. The trench width at the top of the pipe should not be greater than the outside diameter of the pipe barrel plus 2 feet, but shall be sufficient to allow thorough compacting of earth refill adjacent to the bottom half of the pipe. The depth of trench shall be sufficient to allow a minimum cover over the top of the pipe as shown on the drawings. The use of excavating equipment which requires the trench to be excavated to an excessive width will not be allowed. All trenches for buried piping shall be excavated at least 6 inches below the bottom of the pipe and backfilled with pipe bedding material as specified in Section 310517 – Select Granular Materials.
- F. Acceptable excavated materials shall be stockpiled in specified areas until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
 - 1. Locate and retain soil materials away from edge of excavations.
 - 2. Unsuitable backfill material shall be kept separate from all other material and shall be disposed of as specified hereinafter. Disposal of unsuitable and excess excavated material shall be accomplished immediately upon removal from the excavation.
 - 3. Stockpiles shall not be located such that they interfere with traffic or access to public or private property. If necessary, the CONTRACTOR shall maintain additional stockpile areas located elsewhere on the site, and shall transport the suitable backfill material to and from such stockpile areas as required for the work.
 - 4. In built-up districts and in streets where traffic conditions render it necessary, the material excavated from the initial opening shall be removed by the CONTRACTOR as soon as excavated, and the material subsequently excavated, if suitable for the purpose, shall be used to backfill the trenches in which pipe has been laid or structures have been built, and neither the excavated material nor materials of construction shall be stored on the streets or sidewalks.
- G. If the material at the design grade is unsuitable as determined by the ENGINEER, the CONTRACTOR, when ordered in writing, shall excavate additional material to the depth necessary and shall backfill to the proposed grade with select granular material.

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- H. Unless otherwise directed or permitted, not more than 100 feet of trench in advance of the end of the completed pipe or structure therein shall be opened at any time. Every trench in rock shall be fully opened at least 30 feet in advance of any place where masonry or pipe is being laid. Any time when the CONTRACTOR'S crews are not on the job working, a trench length equal to or less than one-half of the last length of pipe installed may be left open, but properly covered or barricaded to protect the public.
- I. At such locations where two pipes may be installed in parallel in a common trench, and where specified, the CONTRACTOR shall install the pipes a minimum of 2 feet apart as measured horizontally from the outside diameter of pipe.

3.05 UNAUTHORIZED EXCAVATION

- A. All excavation outside the lines and grades shown and not specified, together with the removal and disposal of the associated material shall be at the CONTRACTOR'S expense. The unauthorized excavation shall be filled as directed by the ENGINEER with select compacted backfill at the CONTRACTOR'S expense. Claims and damages resulting from the CONTRACTOR'S unauthorized excavation will be his sole responsibility.

3.06 DRAINAGE AND DEWATERING

A. General

1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.
2. Remove water from excavation as fast as it collects.
3. Maintain the ground water level at least 2 feet below the bottom of the excavation to provide a stable surface for construction operations and to prevent damage to the work during all stages of construction.
4. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
5. Provide sediment traps when water is conveyed into water courses.
6. Notify the ENGINEER before shutting down dewatering systems for any reason.
7. Standing water shall not be permitted in the excavation at any time. If the material at the design grade becomes unsuitable or contaminated due to the actions of the CONTRACTOR, the CONTRACTOR shall excavate additional material to the depth necessary and shall backfill to the proposed grade with select fill or crushed stone.
8. 100% stand-by pumps (gasoline powered) shall be maintained at the site at all times.
9. Any hardships created by the temporary dewatering for this Contract which adversely affects the water supply to local property owners, shall be satisfactorily resolved by the CONTRACTOR, including the provision of temporary water service, if required, at no additional cost to the OWNER.
10. Obtain required permits from agencies of jurisdiction, NYSDEC, and USACOE, for any water being discharged into rivers, streams, or water courses.

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B. Disposal of Water Removed by Dewatering Systems

1. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the work under construction or completed.
2. Dispose of water in such a manner as to cause no inconvenience to the owner or others on or adjacent to the site.
3. Convey water from the excavation in a closed conduit. Do not use trench excavations as temporary drainage ditches.
4. Disposal of water shall be by specified methods and shall not cause erosion or sedimentation to occur in existing drainage systems. All sedimentation or blocking of existing systems shall be thoroughly cleaned and returned to original condition by the CONTRACTOR at his expense.
5. Damage caused by the CONTRACTOR'S operations to public or private property shall be repaired by him to the satisfaction of the ENGINEER and the damaged property owner at the CONTRACTOR'S expense.
6. The CONTRACTOR shall perform all work, furnish all materials and install all measures required to reasonably control soil erosion resulting from construction operations and prevent excessive flow of sediment from the construction site. Such work may include the installation of water diversion structures, diversion ditches and sediment basins and seeding, mulching or sodding critical areas to provide temporary protection. The CONTRACTOR shall submit a plan showing the methods to be used for controlling erosion and sedimentation during construction along with the schedule of construction operations to the ENGINEER for review.
7. All erosion and sediment control practices shall be in place prior to any grading operations and installation of proposed structures or utilities.
8. All erosion and sediment control practices shall be left in place until construction is completed and/or area is stabilized.
9. Where necessary, disturbed areas shall be temporarily seeded and/or mulched until proper weather conditions exist for establishment of a permanent vegetative cover.

3.07 SHEETING, SHORING, AND BRACING

A. General

1. Unless otherwise shown or specified, excavations shall be open, shored and braced or sheeted where necessary to prevent injury to workmen, structures, pipelines and utilities.
2. Structures within 100 feet of sheeting installations shall be subject to a pre-construction survey to identify and record existing structural conditions. In the instance of private residencies, the homeowners shall be contacted directly. These inspections shall be carried out by a pre-inspection firm experienced in this line of work.

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3. During the actual construction process, the CONTRACTOR shall provide the monitoring and recording of the actual vibrations generated. A baseline of ambient vibration levels shall be established prior to driving sheet piling.
 - a. The particle acceleration during the driving of the sheet piling shall not exceed 2.0 FPS.
 - b. The CONTRACTOR will be required to change the construction methods if the work is resulting in unacceptable vibration levels.
4. All municipal, county, state, and federal ordinances, codes, regulations, and laws shall be observed. The CONTRACTOR shall provide all sheeting, shoring, and bracing which conforms to New York State Department of Labor – Industrial Code Note 23 and all applicable sections of the 1970 Occupational Safety and Health Act (OSHA), and any other requirements as necessary.
5. All municipal, county, state and federal ordinances, codes, regulations, laws and OSHA regulations shall be observed.
6. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down the shoring and bracing as excavation progresses.
7. Safe and satisfactory sheeting, shoring and bracing shall be the entire responsibility of the CONTRACTOR.
8. The CONTRACTOR shall be held accountable and responsible for the sufficiency of all shoring and bracing used and for all damage to persons or property resulting from the improper quality, strength, placing, maintaining or removing of the same.
9. The ENGINEER'S permission to proceed with work in either a sheeted, shored braced or open trench condition shall in no way relieve the CONTRACTOR from the above responsibilities.
10. The clearances and types of temporary structures, insofar as they affect the character of the finished work, and the design of steel sheeting to be left in place, will be subject to the review of the ENGINEER, but the CONTRACTOR shall be solely responsible for the adequacy of all sheeting, shoring, bracing, cofferdamming, etc.
11. Unless otherwise shown, specified, or ordered, all materials used for temporary construction shall be removed when work is completed. Such removal shall be made in a manner not injurious to the pipelines or structures.
12. All steel sheet piling designed to remain in place shall be new materials. New or used materials may be used for temporary work.
13. Steel sheet piling shall be manufactured from steel conforming to ASTM A328. Steel for soldier piles, wales, and braces shall be manufactured to conform to ASTM A36.

B. Sheeting Left in Place

1. Steel sheet piling shall be left in place or where conditions are such that the removal of sheeting will endanger the work or adjacent pipes or structures or when ordered in writing to be left in place by the ENGINEER. It shall consist of rolled sections of the

SECTION 312317 – EXCAVATION, BACKFILL, AND TRENCHING

continuous interlocking type unless otherwise specified. The type and design of the sheeting and bracing shall conform to the above specifications for all steel work for sheeting and bracing.

2. Steel sheet piling to be left in place shall be driven straight to the lines and grades as shown or directed. The piles shall penetrate into firm materials with secure interlocking throughout the entire length of the pile. Damaged piling having faulty alignment shall be pulled and replaced by new piling.
3. The type of guide structure used and method of driving for steel sheet piling to be left in place shall be submitted to the ENGINEER for review. Jetting will not be permitted.
4. The CONTRACTOR shall cut off piling left in place at least 2 feet below road surface or to the grades shown or ordered by the ENGINEER and shall dispose of the cutoffs.
5. Portions of sheeting or soldier piles and breast boards which are in contact with concrete shall be left in place.

C. Removal of Sheeting and Bracing

1. Sheeting and bracing shall be removed from excavation unless otherwise indicated by the ENGINEER. Removal shall be done so as to not cause injury to the work.
 - a. Wood or steel sheeting shall not be removed when adjacent to structures, pavement, pipes, or any other public or private property where removal may cause damage to such property.
 - b. Fill all voids left by removal of sheeting with select fill.
2. Removal of sheet piling shall be done so as not to cause injury to the Work. Removal shall be equal on both sides of excavation to ensure no unequal loads on pipe or structures.

D. Pipeline Alignment in New York State Department of Transportation and Erie County Highway Department Right-Of-Way:

1. The New York State Department of Transportation and Erie County Highway Department require all trenches or excavations which fall within a 1 on 1 slope as measured from the edge of pavement to be tight-sheeted with pre-driven steel sheet piling prior to excavation.
 - a. The design of the predriven steel sheet piling and bracing system is the responsibility of the CONTRACTOR. The ENGINEER may reject any materials which he regards as unsound.
 - b. A copy of all predriven steel sheet piling and bracing system designs shall be submitted to the ENGINEER for his information before installation of same. Each drawing and computation page shall display the seal and signature of a licensed New York State professional engineer. This information must also be submitted to the Agency having jurisdiction for review and must meet with that Agency's approval.

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- c. The CONTRACTOR'S submittal to the ENGINEER shall include written verification from the Agency of jurisdiction that the information being submitted to the ENGINEER has been approved by that Agency.
 2. If devices other than pre-driven steel sheet piling are approved by the Agency of jurisdiction in areas designated as requiring temporary sheeting, the CONTRACTOR may (with the ENGINEER'S review) be allowed to use them. However, the costs of furnishing and using these devices will be considered as included in the unit prices bid for the various pipe sections.
- E. In areas where the Drawings call for sheeting to remain in place, alternate sheeting methods will not be allowed. Only pre-driven, steel sheet piling systems designed for the CONTRACTOR by a professional engineer will be allowed in these areas.

3.08 BACKFILL AND COMPACTION

- A. All backfill required for trenches and structures required to provide the finished grades shown and as described herein shall be furnished, placed and compacted in 6 inch lifts by the CONTRACTOR. Unless otherwise specified or required, fill shall be obtained from the excavated materials. All materials used for filling and backfilling shall be soil of acceptable quality, free from boulders, frozen lumps, wood, stumps, sludge, or other organic matter or other deleterious or hazardous materials. Excavated materials meeting these requirements and approved by the ENGINEER may be used as backfill.
- B. Rock and/or earth material may be encountered during the work that is unsuitable for backfilling. When this material is encountered, it shall be disposed of in the specified manner, possibly resulting in a shortage of suitable backfill material. In this event, the CONTRACTOR shall be responsible for furnishing, delivering and installing clean earth or select backfill materials to properly and completely backfill the excavation. Backfill material for these situations may be obtained from other areas of the project where suitable material is available or from offsite locations as approved by the ENGINEER. All backfill material is subject to the ENGINEER'S review and must meet the minimum requirements of the specifications above.
- C. Backfill excavations as promptly as work permits, but not until completion of the following:
 1. Inspection by the ENGINEER of all work within the excavation.
 2. Inspection, testing approval, and recording of locations of underground utilities, connections, branches, structures and other facilities.
 3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in a manner to prevent settlement of the structure or utilities, or leave in place if required.
 4. Removal and proper disposal of trash and debris.
- D. Excavation shall be kept dry during backfilling operations. Backfill around piping and structures shall be brought up evenly on all sides.

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- E. The minimum density to be obtained during backfilling operations shall be 95 percent and is a percentage of the maximum density obtained in the laboratory as defined in ASTM D698 Method C including Note 2. This percentage is of modified Proctor density. In-place density determinations shall be made using a sand density cone or equivalent method as specified by ASTM D1556. If any bricks, bottles, pieces of metal, debris or other foreign matter larger than $\frac{3}{4}$ -inch size are encountered in the density test hole, a different test location shall be chosen. The ENGINEER will determine the frequency of field testing required to determine the density of the fill and shall direct the number and location of density tests. All equipment necessary to determine fill density, including nuclear density meters, shall be supplied by the CONTRACTOR.
- F. The water content of fill material shall be controlled during placement within the range necessary to obtain the density specified. In general, the moisture content of the fill shall be within 5 percent dry and 2 percent wet of the optimum moisture content for the specified density as determined by laboratory tests. The CONTRACTOR shall perform all necessary work to adjust the water content of the material to within the range necessary to permit the density specified. No fill material shall be placed and no compaction of fill will be permitted when there is any standing water in the trenches or when the fill material or the ground the fill is to be placed on is frozen.
- G. The CONTRACTOR is not allowed to access any part of an existing water supply system (fire hydrants, etc.) as a source of water for any reason during construction activities, including the use of water for backfilling to obtain the proper moisture content.
- H. If the specified densities are not obtained because of the CONTRACTOR'S improper control of placement or compaction procedures, or because of inadequate or improperly functioning equipment, the CONTRACTOR shall perform whatever work is required to provide the specified densities. This work shall include complete removal of unacceptable fill areas, replacement and recompaction until acceptable fill is provided.
- I. All backfill in pipe trenches shall be placed in horizontal layers not exceeding 6 inches in depth and thoroughly compacted before the next layer is placed.
- J. Where pipe is laid in rock excavation, crushed stone or gravel fill shall be carefully placed and tamped over the rock before the pipe is laid. After laying, pipe, the balance of the backfill shall be placed as described herein above.
- K. Placement:
1. Place pipe bedding, select backfill and/or earth backfill or borrow materials, as specified herein and in Section 15051- Buried Piping Installation.
 2. Trenches under roadways shall be backfilled with select backfill material for the entire length of the open cut crossing plus 5 feet back from the edge of pavement or a distance equal to a 1 on 1 slope to the invert, whichever is greater.
 3. Where shoulders are excavated, the trench shall be backfilled with select granular material.

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4. The entire trench area under driveways, parking areas, and sidewalks, shall be backfilled with select granular material in accordance with the Contract Drawings and Specifications.
5. Prior to commencing with the backfilling operation, the CONTRACTOR shall submit information to the ENGINEER such as catalog cuts, specification sheets, etc., describing the type of compaction equipment he intends to use.

L. Pipe Trench Preparation

1. Braced trench width shall be minimized to greatest extent practical but shall conform to the following:
 - a. Trench width shall be sufficient to provide room for installing, jointing and inspecting piping, as shown on Contract Drawings.
 - b. Enlargements at pipe joints may be made if required and specified by the ENGINEER.
 - c. Trench width shall be sufficient for sheeting, bracing, sloping, and dewatering.
 - d. Trench width shall be sufficient to allow thorough compacting of backfill.
 - e. Do not use excavating equipment which requires the trench to be excavated to excessive width.
2. Depth of trench shall be as shown. If required, depths may be revised as specified by the ENGINEER.

- M. The CONTRACTOR shall repair any settlement that occurs at no additional cost to the OWNER.

3.09 GRADING

A. General

Uniformly grade areas within limits of grading under this Section including adjacent transition areas. Smooth subgrade surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Turfed Areas

Finish areas to receive topsoil to within not more than 1 inch above or below the required subgrade elevation.

C. Walks and Pavements

Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than $\frac{1}{2}$ inch above or below the required subgrade elevation.

SECTION 312317 – EXCAVATION, BACKFILL, AND TRENCHING

D. Slabs

Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 3 inch when tested with a 10 foot straightedge.

E. Compaction

After grading, compact subgrade surfaces to the depth and percentage of maximum density required.

F. All existing drainage swales and ditches, if disturbed, shall immediately, upon completion of pipe installation, be restored to proper lines and grades. CONTRACTOR shall ensure the final drainage facilities are in working condition and acceptable to the agency of jurisdiction.

3.10 PAVEMENT SUBBASE COURSE

A. General

Place subbase material, in layers of specified thickness, over ground surface to support the pavement base course.

B. Grade Control

During construction, maintain lines and grades including crown and cross-slope of subbase course.

C. Shoulders

Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials as specified, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least 12 inch width of shoulder simultaneously with compacting and rolling of each layer of subbase course.

D. Placing

Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations. When a compacted subbase course is shown to be 6 inches thick or less, place material in a single layer. When shown to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.

3.11 DISPOSAL OF EXCAVATED MATERIALS

A. Material removed from the excavations which does not conform to the requirements for fill or is in excess of that required for backfill shall be hauled away by the CONTRACTOR and

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disposed of in compliance with Municipal, County, State, Federal or other applicable regulations at no additional cost to the OWNER.

- B. The CONTRACTOR shall not dispose waste excavated material in any of the following locations:
1. Wetland areas.
 2. Flood plains.
 3. Any area where excess siltation will damage or pollute receiving water.
 4. Disposal of excess materials shall only be allowed at locations approved by NYSDEC Region 9.

3.12 RESTORATION AND CLEAN-UP

- A. Following installation, the CONTRACTOR shall restore all areas to their original condition to the satisfaction of the ENGINEER.

END OF SECTION

SECTION 312318 - ROCK REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing identified and discovered rock during excavation.
2. Expansive tools to assist rock removal.

B. Related Sections:

1. Section 312316 - Excavation: Building excavation.
2. Section 312323 - Fill: Backfill materials.

1.2 REFERENCES

A. National Fire Protection Association:

1. NFPA 495 - Explosive Materials Code.

1.3 DEFINITIONS

- A. Site Rock: Solid mineral material with volume in excess of one (1) cu yd or solid material that cannot be removed with 3/4 cu yd capacity excavator without drilling, jack hammering, or blasting.

1.4 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.

1.5 SCHEDULING

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify site conditions and note subsurface irregularities affecting Work of this section.

3.2 PREPARATION

- A. Identify required lines, levels, contours, and datum.

SECTION 312318 - ROCK REMOVAL

3.3 ROCK REMOVAL BY MECHANICAL METHOD

A. Limits of Rock Excavation

1. Structures:

- a. The lowest elevation of the structure, manhole, pump station, plus bedding etc. at each location or as directed by the Engineer.
- b. Vertical planes located 12 inches outside the footing or as shown on the Contract Drawings.
- c. As ordered by Engineer.

2. Pipe Trenches: The width of trenches shall be the outside diameter of the pipe plus 2 feet, exclusive of bells, branches, hubs, spurs or cradles. The sides of the trench shall be vertical.

- a. The depth of the trench shall be the depth on the bottom of the pipe exclusive of bells and branches plus bedding.
- b. The length shall be equal to the laid length of pipe, measured horizontally.
- c. Additional width in pipe trenches at field joints or beyond the lines described above will be considered outside the limits described.
- d. As ordered by the Engineer.

B. When there is a separate pay bid item for rock excavation, the rock shall be uncovered prior to removal in sections acceptable to the Engineer so that it may be measured.

C. When there is not a separate pay bid item for rock excavation, the rock shall be uncovered prior to removal in sections acceptable to the Engineer for observation and for record.

3.4 METHODS OF REMOVAL

A. Hand removal

1. The Contractor shall remove rock by hand methods such as drilling, jack-hammering and mechanical excavation.
2. Under no circumstances will blasting be allowed. Explosive materials used primarily for blasting operations are not allowed on site.

3.5 DISPOSAL

A. Backfill

1. Pieces of rock larger than 4 inches shall not be used in backfilling pipe trenches.
2. Rock backfill shall not be placed within two feet of the outside diameter of pipes.
3. The quantity of rock used in any backfill location shall not be so great as to result in voids, as determined by the Engineer.
4. Rock backfill shall not be placed within 18 inches of the surface of finish grade.
5. Excess or unacceptable rock may be disposed of on the site only where shown or specified by the Engineer. Rock which cannot be disposed of on the site shall be

SECTION 312318 - ROCK REMOVAL

removed and disposed of off the site at the Contractor's expense and in compliance with all applicable federal, state and local regulations.

- B. The rock excavated, which cannot be incorporated into the backfill material, as specified, shall be disposed of as spoil and shall be replaced with the quantity of acceptable material for backfilling.

3.6 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Request visual inspection of foundation bearing surfaces by inspection agency before installing subsequent work.

END OF SECTION

SECTION 312318 - ROCK REMOVAL

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SECTION 312323 - FILL

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Backfilling building perimeter to subgrade elevations.
2. Backfilling site structures to subgrade elevations.
3. Fill under slabs-on-grade.
4. Fill under paving.
5. Fill for over-excavation.

B. Related Sections:

1. Section 033000 - Cast-In-Place Concrete: Concrete materials.
2. Section 310516 - Aggregates for Earthwork: Aggregates for fill.
3. Section 312316 - Excavation.
4. Geotechnical Report; borehole locations and findings of subsurface materials.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data for geotextile fabric indicating fabric and construction.

SECTION 312323 - FILL

- C. Materials Source: Submit name of imported fill materials suppliers.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements NYSDOT Standard Specifications Current Edition.

1.04 QUALITY ASSURANCE

- A. Perform Work in accordance with Village of Ellicottville and NYSDOT Standard Specifications, Current Edition.

PART 2 - PRODUCTS

2.01 FILL MATERIALS

- A. Structural Fill: Select structural fill as specified in Section 310516.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Coordination and project conditions.
- B. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- C. Verify underground tanks are anchored to their own foundations to avoid flotation after backfilling.
- D. Verify structural ability of unsupported walls to support loads imposed by fill.

3.02 PREPARATION

- A. Compact subgrade to density requirements for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with structural granular fill and compact to density equal to or greater than requirements for subsequent fill material.
- C. Scarify subgrade surface to depth as required.
- D. Proof roll to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

SECTION 312323 - FILL

3.03 BACKFILLING

- A. All trenches and excavation shall be backfilled to the original surface of the ground or to such other grades as may be shown on the plans or directed by the engineer.
- B. Backfill areas to contours and elevations with sound material, free from waste, objectionable organic material, rubbish, boggy or unsuitable. No frozen material shall be used.
- C. Backfilling shall begin as soon as practicable after structures and pipelines have been installed and inspected. Materials for bedding and backfill shall be as shown on the drawings and as specified.
- D. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- E. Place fill material in continuous layers and compact in accordance with schedule at end of this section.
- F. Backfill shall be placed in uniform horizontal layers and shall be tamped or otherwise consolidated as the work progresses. In no case shall the consolidated layers of backfill be more than 6-inches in depth. Lumps of earth shall be broken up and if there are any stones or lumps that cannot be readily broken up, they shall be distributed throughout the mass so that all interstices are solidly filled with fine materials.
- G. Employ placement method that does not disturb or damage other work.
- H. Maintain optimum moisture content of backfill materials to attain required compaction density.
- I. Backfill against supported foundation walls. Do not backfill against unsupported foundation walls.
- J. Backfill simultaneously on each side of unsupported foundation walls until supports are in place.
- K. Slope grade away from building minimum 2 percent slope for minimum distance of 10 ft, unless noted otherwise.
- L. Make gradual grade changes. Blend slope into level areas.
- M. Remove surplus backfill materials from site.
- N. Leave fill material stockpile areas free of excess fill materials.

3.04 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Top Surface of Backfilling Within Building Areas: Plus or minus 1/4 inch from required elevations.

SECTION 312323 - FILL

- C. Top Surface of Backfilling Under Paved Areas: Plus or minus 1/2 inch from required elevations.
- D. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.05 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Perform laboratory material tests in accordance with ASTM D1557, ASTM D698, and AASHTO T180.
- C. Perform in place compaction tests in accordance with the following:
 - 1. Density Tests: or ASTM D2922.
 - 2. Moisture Tests: ASTM D3017.
- D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- E. Frequency of Tests: As directed by Engineer.
- F. Proof roll compacted fill surfaces under slabs-on-grade, pavers, and paving.

3.06 PROTECTION OF FINISHED WORK

- A. Section 017000 - Execution and Closeout Requirements: Protecting finished work.
- B. Reshape and re-compact fills subjected to vehicular traffic.

3.07 SCHEDULE

- A. Structures:
 - 1. Backfill with specified material and compact to 95% for granular material.

END OF SECTION

SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Sediment Socks/Wattle/Silt Fence.
2. Inlet Protection.
3. Sediment Filter Bags.
4. Stabilized Construction Entrance.
5. Dust Control.
6. Concrete Wash Area.

B. Related Sections:

1. Section 310516 - Aggregates for Earthwork.
2. Section 310517 - Select Granular Materials.
3. Section 312316 - Excavation.
4. Section 312317 - Excavation , Backfilling and Trenching.
5. Section 312323 - Fill.

C. This project did not meet the requirements for a NYSDEC Stormwater Pollution Prevention Plan. If the Engineer identifies a situation which constitutes stormwater pollution, the Contractor shall immediately take action, using the products identified herein.

1.02 REFERENCES

A. New York State:

1. Standards and Specifications for Erosion and Sediment Control (current edition).
2. Stormwater Design Manual (current edition).
3. Department of Transportation Standard Specifications (current edition).

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Product Data: Submit data on sediment socks/wattles/silt fence, inlet protection, sediment filter bags.
- C. Samples: N/A
- D. Test Reports: N/A.

SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS

- E. Manufacturer's Certificate: Certify silt socks/wattles/silt fence, inlet protection, sediment filter bags meet or exceed New York State Erosion, Sediment & Stormwater requirements.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with requirements of Section 312316, and Section 312317.
- B. Perform Work in accordance with State of New York and Town of Evans Standards.
- C. Maintain one copy of SWPPP document on-site.

1.06 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum two week prior to commencing work of this section.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not place grout when air temperature is below freezing.
- C. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.01 ROCK AND GEOTEXTILE MATERIALS

- A. Furnish materials in accordance with New York State Department of Transportation Standard Specifications and New York State Standards and Specifications for Erosion & Sediment Control (current editions).

2.02 SEDIMENT SOCKS/WATTLE/SILT FENCE

- A. Furnish materials in accordance with New York State Department of Transportation Standard Specifications and New York State Standards and Specifications for erosion and sediment control (current editions).

SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS

2.03 INLET PROTECTION

- A. Furnish materials in accordance with New York State Department of Transportation Standard Specifications and New York State Standards and Specifications for erosion and sediment control (current editions).

2.04 SEDIMENT FILTER BAGS

- A. Furnish materials in accordance with New York State Department of Transportation Standard Specifications and New York State Standards and Specifications for erosion and sediment control (current editions).

2.05 STABILIZED CONSTRUCTION ENTRANCE

- A. Furnish materials in accordance with New York State Department of Transportation Standard Specifications and New York State Standards and Specifications for erosion and sediment control (current editions).

2.06 DUST CONTROL

- A. Furnish materials in accordance with New York State Department of Transportation Standard Specifications and New York State Standards and Specifications for erosion and sediment control (current editions).

2.07 CONCRETE WASH AREA

- A. Furnish materials in accordance with New York State Department of Transportation Standard Specifications and New York State Standards and Specifications for erosion and sediment control (current editions).

2.08 BLOCK, STONE, AGGREGATE, AND SOIL MATERIALS

- A. Course Aggregate: Type A1, as specified in Section 310516.
- B. Soil Backfill: Soil Type S1, as specified in Section 310513.

2.09 PLANTING MATERIALS

- A. Seeding and Soil Supplements: as specified in New York State Department of Transportation Standard Specifications.
- B. Mulch: as specified in New York State Department of Transportation Standard Specifications.

SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify compacted subgrade, granular base, stabilized soil is acceptable and ready to support devices and imposed loads.
- C. Verify gradients and elevations of base or foundation for other work are correct.

3.02 SEDIMENT SOCKS/WATTLES/SILT FENCE

- A. Clear debris and vegetation as necessary as specified in Section 311000.
- B. Install control measures.
- C. Ensure full adherence to ground or subsoil.

3.03 INLET PROTECTION

- A. Clean inlet surface as necessary to allow for installation.
- B. Install control measure.
- C. Ensure full inlet coverage.

3.04 SEDIMENT FILTER BAG

- A. Install control measure.

3.05 STABILIZED CONSTRUCTION ENTRANCE

- A. Prepare area to proper subgrade depth by removing debris, vegetation, soil or stone as necessary as specified in Sections 311000, 312213, and 312316.
- B. Install geotextile and stone.

3.06 DUST CONTROL

- A. Prevent dust creation by spraying water on construction areas as necessary.
- B. If site areas continue to exhibit dust problems, install temporary or permanent measures (i.e. grass, mulch, polymer, etc.) as necessary. Consult with Engineer first.

SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS

3.07 CONCRETE WASH AREA

- A. Install control measure.
- B. Ensure water tightness to avoid concrete escaping wash area.

3.08 SITE STABILIZATION

- A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.
- B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.
- C. Stockpile and waste pile heights shall not exceed 12 feet. Slope stockpile sides at 1: 1 or flatter.
- D. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 14 days.
 - 1. During non-germinating periods, apply mulch at recommended rates.
 - 2. Stabilize disturbed areas which are not at finished grade and which will be disturbed within one year in accordance with Section 329219 at 100% percent of permanent application rate with no topsoil.
 - 3. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with Section 329219 permanent seeding specifications.
- E. Stabilize diversion channels, swales, discharge outlets, slopes, etc.

3.09 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.
- C. Compaction Testing: As specified in Section 312323.
- D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- E. Frequency of Compaction Testing: One for each lift.

3.10 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

SECTION 312500 - EROSION AND SEDIMENTATION CONTROLS

- B. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.
- C. Do not damage structure or device during cleaning operations.
- D. Do not permit sediment to erode into construction or site areas or natural waterways.
- E. Clean channels when depth of sediment reaches approximately one half channel depth.

3.11 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

END OF SECTION

SECTION 316216 - STEEL PILES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Rolled steel section piles.

B. Related Sections:

1. Section 033000 - Cast-In-Place Concrete: Concrete requirements for placement of grade beams.
2. Section 310813 - Pile Load Tests: Requirements for pile load tests.
3. Section 312316 - Excavation: Excavating to working level.

1.02 UNIT PRICES - MEASUREMENT AND PAYMENT

A. Designed Piles:

1. Design Pile Quantity: Determined by number of piles indicated in Contract Documents.
2. Design Pile Length: By linear foot 20 measured from point to cut-off elevation.
3. Test Piles: 5 feet longer than design length piles.

B. Actual Piles:

1. Actual Pile Quantity: Determined by number of piles identified in Project Record Documents.
2. Actual Pile Length: Determined by length of piles identified in Project Record Documents.

1.03 REFERENCES

A. ASTM International:

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
3. ASTM A588 - Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4-in. (100-mm) Thick.
4. ASTM A690/A690M - Standard Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel H-Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments.
5. ASTM A913/A913M - Standard Specification for High-Strength Low-Alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-Tempering Process (QST).
6. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.

SECTION 316216 - STEEL PILES

- B. American Welding Society:
 - 1. AWS D1.1 - Structural Welding Code - Steel.
 - 2. AWS D1.5 - Bridge Welding Code.
- C. SSPC: The Society for Protective Coatings:
 - 1. SSPC PA 2 - Measurement of Dry Coating Thickness with Magnetic Gages.
 - 2. SSPC SP 5 - White Metal Blast Cleaning.

1.04 PERFORMANCE REQUIREMENTS

- A. Drive piles to defined load supporting capacity.

1.05 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate details and schedule of pile installation sequence. Identify pile length and shapes to suit design loads.
- C. Product Data: Submit details of collars, tips, splices, and cushion blocks.
- D. Manufacturer's Mill Certificate: Certify pipe piles meets or exceeds specified requirements.

1.06 SUSTAINABLE DESIGN SUBMITTALS

- A. Section 018113 - Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
 - 1. Materials Resources Certificates:
 - a. Certify recycled material content for recycled content products.
 - b. Certify source for regional materials and distance from Project site.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
 - 1. Provide cost data for the following products:
 - a. Products with recycled material content.
 - b. Regional products.

SECTION 316216 - STEEL PILES

1.07 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Accurately record the following:
 - 1. Sizes, lengths, and locations of piles.
 - 2. Sequence of driving.
 - 3. Number of blows per foot for entire length of piles and measured set for last 10 blows.
 - 4. Identify piles requiring drilling, and hole diameters.
 - 5. Final base and top elevations.
 - 6. Driving force of each hammer blow.

1.08 QUALITY ASSURANCE

- A. Perform Work according to State of New York Building Code.
- B. Maintain one copy of document on site.

1.09 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum 5 years documented experience.
- B. Design and select pile components under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of New York.
- C. Monitor pile driving operations by Geotechnical Engineer experienced in this Work and licensed in State of New York.
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.10 PRE-INSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing Work of this section.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Protect shop coated piles from damage to applied coating. Use nylon slings to handle coated piles.

SECTION 316216 - STEEL PILES

1.12 SCHEDULING

- A. Schedule test piles.
- B. Do not drive piles until excavation or filling of area surrounding piles is completed to design grades indicated on Drawings.
- C. Do not drive piles until mud-line is clear of debris or other material interfering with pile driving.
- D. When concrete is less than seven days old, do not drive piles closer to concrete than distance computed by formula below.
 - 1. $D = 1/7 \sqrt{E}$:
 - a. E = Energy of pile hammer in foot-pounds
 - b. D = Distance in feet

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Piles: ASTM A572; structural steel, rolled pipe piles sections, minimum 50 ksi yield strength; sizes and lengths indicated on Drawings.
- B. Accessories: Points, driving cap; to suit pile shape.

2.02 SHOP FINISHING

- A. Prepare steel surfaces to be coated according to SSPC SP 5. Blast clean surfaces using steel shot or grit.
- B. Coat exposed surfaces of steel piles with electrostatically applied, fusion bonded epoxy to minimum dry coat thickness of 18 mils, as tested according to SSPC PA 2.
- C. Apply coating with uniform gloss and thickness in cured coating, free of blisters, pinholes, fish-eyes, sags, runs, and other irregularities.
- D. Allow coating to cure before driving piles.

2.03 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.

SECTION 316216 - STEEL PILES

- B. Test sample piles according to Section 310813.
- C. Test for continuity of coating with a holiday tester of 100 volts or less. Repair detected holidays and other coating imperfections.
- D. Maintain record of coating tests and inspections. Submit test and inspection record.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

3.02 PREPARATION

- A. Use driving method which will not cause damage to nearby structures.
- B. Notify adjacent and affected land owners and building occupants with 10 days notice before proceeding with the Work.
- C. Protect structures including overhead and buried utilities near the Work, from damage.
- D. Prepare to place piles from excavated working elevation.
- E. Field Touch-Up Pile Coating:
 - 1. Provide touch-up system for repair of coating defects compatible with shop coating.
 - 2. Before driving, touch-up abraded surfaces in coating. Clean and touch-up field welds.
 - 3. Apply touch-up coating to match shop coating.

3.03 PILE HAMMER

- A. Use pile hammer complying with requirements indicated on Drawings.
- B. Keep hammer in good mechanical condition.
- C. Operate hammer at speed and pressure recommended by manufacturer.
- D. When energy per blow is less than 80 percent of rated energy per blow as specified by manufacturer of pile hammer, make necessary repairs to improve energy output to value of at least 80 percent of rated energy per blow, or replace pile hammer.

SECTION 316216 - STEEL PILES

3.04 INSTALLATION

- A. Drive piles only in presence of Engineer.
- B. Use rigid frame, fixed lead type driving equipment capable of supporting pile firmly in vertical position or to required batter.
- C. Align top of pile normal to driving force of pile, hammer and leads to minimize bowing of pile during impact of hammer ram.
- D. Where groups of piles are required, drive center pile of group first and then drive remaining piles in group progressing outward from center.
- E. Drive piles to minimum tip penetration and to driving resistance indicated on Drawings. Take corrective action, when required, to prevent observable impact bowing of pile at final driving resistance.
- F. When driving resistance prohibits advancing pile to required minimum tip penetration, spud, jet, jet and drive, or use other means as necessary to advance pile to required minimum tip penetration. Then drive pile to required resistance indicated on Drawings. After jetting pile, re-drive adjacent piles to required resistance.
- G. Pre-drilling or pre-augering hole of maximum diameter 2 inches smaller than pile flange dimension may be used to advance pile to penetration no deeper than required minimum tip penetration. Then drive pile to required resistance indicated on Drawings.
- H. Protect pile head during driving, using cap-block cushion consisting of alternate plates of phenolic laminate and aluminum designed to prevent damage to piles while transmitting required hammer energy to pile top as indicated on Drawings, with full bearing on pile butt for even distribution of hammer blow.
- I. Deliver hammer blows to central axis of pile.
- J. When driving is interrupted before refusal, drive an additional 12 inches before resuming recording of performance data.
- K. Re-drive piles which have lifted due to driving adjacent piles, or by soil uplift.
- L. Do not damage piles during driving operations.
- M. Cut off tops of piles to elevations indicated and prepare pile top to receive grade beams.

3.05 WELDING AND SPLICING

- A. Perform welding according to AWS D1.1 for shielded metal arc welding.
- B. Only use welders qualified according to AWS D1.1.
- C. Reinforce pile tips, as indicated on Drawings.
- D. Splice pile sections as follows:

SECTION 316216 - STEEL PILES

1. Complete penetration butt weld of flanges and web.
 2. Splicer sleeve with flanges welded with full penetration groove welds.
- E. Use jig or alignment device during welding to maintain required specified.
- F. For splices made during pile installation, rigid frame pile leads may be used as jig.
- G. Use only butt weld splices within 20 feet from pile cut-off elevation or design grade, whichever is lower.
- H. Comply with the following for number, type and location of splices:
1. No more than three splices for piles over 100 feet long.
 2. No more than two splices for piles up to 100 feet long.
 3. No splice closer than 25 feet from tip.

3.06 ERECTION TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Maximum Variation from Vertical for Plumb Piles: 1 in 48.
- C. Maximum Variation from Required Angle for Batter Piles: 1 in 24.
- D. Maximum Variation from Pile Cut-Off Elevation: 4 inches.
- E. Maximum Out-of-Position: 2 inches.
- F. Maximum Variation in Centerline after Splicing: 3/8 inch in 40 feet for undriven portion.

3.07 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Request inspection of foundations according to applicable code.
- C. Perform load tests to requirements of Section 310813.
- D. Test Piles: Same diameter and type as specified for other piling, placed in same manner.
- E. Accepted test piles may be used in the Work.
- F. Unacceptable Piles: Piles that fail tests, are placed out of position, are below cut-off elevations, or are damaged.
- G. Provide additional piles or replace piles to conform to specified requirements.

END OF SECTION

SECTION 316216 - STEEL PILES

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DIVISION 32
EXTERIOR IMPROVEMENTS

SECTION 321123 - AGGREGATE BASE COURSES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Aggregate subbase.
 - 2. Aggregate base course.
- B. Related Sections:
 - 1. Section 312323 - Fill: Compacted fill under base course.
 - 2. Section 321216 - Asphalt Paving: Binder and finish asphalt courses.

1.02 REFERENCES

- A. NYSDOT Standard Specifications current edition, Section 300, 400 and 700.
- B. American Association of State Highway and Transportation Officials:
 - 1. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
- C. ASTM International:
 - 1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
 - 2. ASTM D2940 - Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data:
 - 1. Submit data for stone base course.
- C. Materials Source: Submit name of aggregate materials suppliers.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements NYSDOT Standard Specifications, current edition.

SECTION 321123 - AGGREGATE BASE COURSES

1.04 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work. Notify Engineer before hand if this cannot be achieved.
- B. Perform Work in accordance with NYSDOT Standard Specifications current edition.

PART 2 - PRODUCTS

2.01 AGGREGATE MATERIALS

- A. Coarse Aggregate: Fill Type NYSDOT Subbase Type 2 Crusher Run Stone as specified in Section 310516.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify compacted substrate is dry and ready to support paving and imposed loads.
 - 1. Proof roll substrate with 6 in minimum two perpendicular passes to identify soft spots.
 - 2. Remove soft substrate and replace with compacted fill as specified in Section 321123-3.5.A and 312323.
- C. Verify substrate has been inspected, gradients and elevations are correct.

3.02 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place fill on soft, muddy, or frozen surfaces.

3.03 AGGREGATE PLACEMENT

- A. Install geotextile fabric over subgrade in accordance with manufacturer's instructions.
 - 1. Lap ends and edges minimum 6 inches.
 - 2. Anchor fabric to subgrade when required to prevent displacement until aggregate is installed.

SECTION 321123 - AGGREGATE BASE COURSES

- B. Place aggregate equal thickness layers to total compacted thickness as indicated on Drawings.
 - 1. Maximum Layer Compacted Thickness: 6 inches.
 - 2. Minimum Layer Compacted Thickness: 3 inches.
- C. Level and contour surfaces to elevations, profiles, and gradients indicated.
- D. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.
- E. Maintain optimum moisture content of fill materials to attain specified compaction density.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements and 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

3.05 COMPACTION

- A. Aggregate shall be compacted to requirements of NYSDOT Standard Specifications Section 203-3.03c, "Compaction".

3.06 SCHEDULES

- A. Refer to Drawing details for subbase thicknesses.

END OF SECTION

SECTION 321123 - AGGREGATE BASE COURSES

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SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Asphalt materials.
2. Aggregate materials.
3. Aggregate subbase.
4. Asphalt paving base course, binder course, and wearing course.

B. Related Requirement:

1. Section 310516 - Aggregates for Earthwork: Product requirements for aggregate for placement by this section.
2. Section 312323 - Fill: Compacted subbase for paving.
3. Section 321123 - Aggregate Base Courses: Compacted subbase for paving.

1.02 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:

1. AASHTO M17 - Standard Specification for Mineral Filler for Bituminous Paving Mixtures.
2. AASHTO M29 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
3. AASHTO M140 - Standard Specification for Emulsified Asphalt.
4. AASHTO M208 - Standard Specification for Cationic Emulsified Asphalt.
5. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
6. AASHTO M320 - Standard Specification for Performance-Graded Asphalt Binder.
7. AASHTO M324 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
8. AASHTO MP1a - Standard Specification for Performance-Graded Asphalt Binder.

B. Asphalt Institute:

1. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
2. AI MS-19 - Basic Asphalt Emulsion Manual.
3. AI SP-2 - Superpave Mix Design.

C. ASTM International:

1. ASTM C1371-2004a - Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.

SECTION 321216 - ASPHALT PAVING

2. ASTM C1549-2004 - Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
3. ASTM D242 - Standard Specification for Mineral Filler For Bituminous Paving Mixtures.
4. ASTM D692 - Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
5. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
6. ASTM D977 - Standard Specification for Emulsified Asphalt.
7. ASTM D1073 - Standard Specification for Fine Aggregate for Bituminous Paving Mixtures.
8. ASTM D1188 - Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
9. ASTM D2027 - Standard Specification for Cutback Asphalt (Medium-Curing Type).
10. ASTM D2397 - Standard Specification for Cationic Emulsified Asphalt.
11. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
12. ASTM D2950 - Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
13. ASTM D3381 - Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction.
14. ASTM D3515 - Standard Specification for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
15. ASTM D3549 - Standard Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
16. ASTM D3910 - Standard Practices for Design, Testing, and Construction of Slurry Seal.
17. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
18. ASTM E408-1971(1996)e1 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
19. ASTM E903-1996 - Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres.
20. ASTM E1918-1997 - Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
21. ASTM E1980-2001 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data:
 1. Submit product information for asphalt and aggregate materials.
 2. Submit mix design with laboratory test results supporting design.
- C. Manufacturer's Certificate: Certify products meet or exceed NYSDOT Standard Specifications, current edition.

SECTION 321216 - ASPHALT PAVING

1.04 QUALITY ASSURANCE

- A. Mixing Plant: Conform to NYSDOT Standard Specifications, current edition.
- B. Mixing Plant: Certified by NYSDOT.
- C. Obtain materials from same source throughout.
- D. Perform Work in accordance with NYSDOT Standard Specifications current edition.

1.05 QUALIFICATIONS

- A. Installer: Company specializing in performing work of this section with minimum five years documented experience.

1.06 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.
- B. Do not place asphalt mixture between November 1 and April 14. Asphalt placed outside this timeframe must provide a limited warranty against defects in such work.
- C. Do not place asphalt mixture when ambient air or base surface temperature is less than 40 degrees F for lift sections 3-inches or greater, or surface is wet or frozen.

PART 2 - PRODUCTS

2.01 SUSTAINABILITY CHARACTERISTICS

- A. Reclaimed or recycled material can be included as per NYSDOT Standard Specifications, current edition.

2.02 ASPHALT PAVING

- A. Performance/Design Criteria:
 - 1. Asphalt paving section shall be as the following per contract documents:
 - a. Stone Base Course Type 2: 6-inches, NYSDOT Item #304.12 (Select Backfill per 310516).
 - b. Asphalt 19 F9 Binder Course HMA, 80 Series Compaction: 3-inches, NYSDOT Item #402.19802
 - c. Asphalt 9.5Top Course HMA, 80 Series Compaction: 1-1/2-inches, NYSDOT Item #402.098902

SECTION 321216 - ASPHALT PAVING

B. Asphalt Materials:

1. Unless otherwise specified herein, all bituminous macadam materials and work shall conform to the applicable requirements of the NYSDOT Standard Specifications, current edition.
2. The materials shall include but not limited to:
 - a. Asphalt binder
 - b. Asphalt cement
 - c. Aggregates
 - d. Tack coat
 - e. Emulsions

2.03 MIXES

- A. Mix shall adhere to Hot Mix Asphalt (HMA) Pavement Requirements per NYSDOT Standard Specifications Sections 400 and 700 per current standards.

2.04 ACCESSORIES

- A. Geotextile Stabilization Fabric: NYSDOT Item 207.24 and as per materials Section 737-01E.

2.05 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Testing, inspection and analysis requirements.
- B. Submit proposed mix design for review prior to beginning of Work.
- C. Test samples in accordance with NYSDOT Standard Specifications Section 400.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify utilities indicated under paving are installed with excavations and trenches backfilled and compacted.
- C. Verify compacted soil subbase is dry and ready to support paving and imposed loads.
 1. Remove any unsuitable subgrade materials or soft subbase and replace with compacted fill as specified in Section 312323.
- D. Verify gradients and elevations of base are correct.

SECTION 321216 - ASPHALT PAVING

- E. Verify gutter drainage grilles and manhole frames and are installed in correct position and elevation.

3.02 PREPARATION

- A. Prepare subbase in accordance with NYSDOT Standard Specifications, current edition.

3.03 INSTALLATION

- A. The Contractor shall construct pavement in the locations shown and to the grade and compacted depth pavement indicated.
- B. The bottom two courses shall be Type A4 aggregate, uniformly graded, crushed stone, each compacted to a total 6 inches in depth. The depth of loose stone, in all cases, shall be gauged by the use of cubical blocks of suitable size. The spreading of any layer or course of broken stone, or filler shall be done from suitable spreader equipment or from piles dumped along the road as directed by the Engineer. No segregation of large or fine particles will be allowed, but the stone as spread shall be well graded with no pockets of fine material. After the bottom course of stone has been laid loose, it shall be thoroughly rolled with an approved roller weighing not less than ten (10) tons.
- C. This rolling must begin at the sides and continue toward the center and shall continue until there is no movement of the course ahead of the roller. After the course is thoroughly compacted, No. 1 stone and screenings or sand, or a mixture of these, shall be uniformly spread, either by hand labor or by an approved mechanical device, upon the surface and swept in by means of a gang-dragged broom of an approved type and rolled dry. After rolling, the course shall be tested with a line 40 feet in length and any depression over 1/2 inch in depth shall be satisfactorily eliminated. After the completion of the rolling, no hauling other than that necessary for bringing material for the next course shall be allowed over the rolled material. It is the intention to bind this course with the small stone, but no surplus or filler will be allowed on this course. This course shall not be laid in excess of 500 linear feet without being rolled and thoroughly filled so as to render it waterproof and thereby prevent the softening up of the subgrade.
- D. If the subgrade material shall become churned up into, or mixed with the bottom course through any reason whatsoever, the Contractor shall at his own expense remove such mixture of subgrade material and broken stone, or gravel, and replace it with clean broken stone, or gravel, of the proper size and shall roll or otherwise compact the material so as to produce a uniform, firm and even bottom course.
- E. If hand spreading is used, all filler shall be delivered and piled alongside the road before the course is placed.
- F. Over this prepared base course, construct a 4-1/2 inch compacted depth two-course, asphalt concrete, consisting of 3 inches of binder course and 1-1/2 inches of top course per Section 321216-2.2.

SECTION 321216 - ASPHALT PAVING

- G. After the roadway areas are completed, the Contractor shall string lines along the edges of the pavement and shall trim the edges as required by the Engineer to give a neat edge appearance to the road construction.
- H. Slope all roadway areas as shown on the Drawings to catch basins so that there are no low spots where water will collect.
- I. In general the new pavement shall be graded to drain as shown on the Drawings. Where new paving work meets existing paving, care shall be taken to provide a neat and smooth transition in a neat and workmanlike manner.

3.04 TOLERANCES

- A. Section 014000 - Quality Requirements: Tolerances.
- B. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- C. Scheduled Compacted Thickness: Within 1/4 inch.
- D. Variation from Indicated Elevation: Within 1/2 inch.

3.05 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting, testing.
- B. Material tickets: Copies of tickets for materials placed must be provided to engineer/inspector.
- C. Asphalt Paving Mix Temperature: Measure temperature at time of placement.
- D. Asphalt Paving Thickness: Measure thickness at time of placement.

3.06 PROTECTION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.
- B. Immediately after placement, protect paving from mechanical injury or until surface temperature is less than 140 degrees F.

3.07 SCHEDULES

- A. Refer to drawing details for subbase thicknesses.

END OF SECTION

DIVISION 33

UTILITIES

SECTION 331100 – BURIED PIPING INSTALLATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work Specified

The work specified shall include all labor, material, equipment, services and incidentals necessary to furnish and install watermain, specials and fittings, install fire hydrants and to perform interconnections and abandonments as shown on the plans and specified herein.

B. Related Work Specified Elsewhere

1. Section 310517 - Select Granular Materials
2. Section 310518 – Rock Removal
3. Section 312317 - Excavation, Backfill, and Trenching
4. Section 331301 - Testing and Disinfection

1.02 QUALITY ASSURANCE

A. Reference Standards

1. AWWA Standards identified in other related sections
2. ASTM Standards identified in other related sections
3. ANSI Standards identified in other related sections
4. Occupational Safety and Health Administration (OSHA)
5. 1996 Safe Drinking Water Act
6. NSF/ANSI Standard 60 and 61, as applicable
7. All other standards itemized in related work sections

1.03 SUBMITTALS

A. Shop Drawings

Prior to obtaining any products in relationship to this Section, the CONTRACTOR shall submit detailed shop drawings and data for review by the ENGINEER.

B. Materials List

The CONTRACTOR shall submit, along with shop drawings, a materials list, which shall include full information regarding all components of the watermain. Materials of construction shall be presented in the listing.

SECTION 331100 – BURIED PIPING INSTALLATION

C. Other Submittals

1. Prior to installation of the proposed watermain, the CONTRACTOR shall furnish the required number of the manufacturer's Operation and Maintenance Manual for each item.
2. The CONTRACTOR shall submit certificates of compliance with the applicable referenced standards.
3. A tabulated layout schedule.
4. Detailed procedure, schedules and list of materials for interconnection sequence.
5. Furnish delivery tickets indicating the pipe manufacturer, pipe type and class, identifying that the pipe was new and from a manufacturer that has been submitted and approved.

D. Certificate

1. Submit certificate of compliance with NSF/ANSI Standard 61 for all products under this section, including interior coatings, by an independent, authorized laboratory.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. During delivery and handling, all materials shall be braced and protected from any distortion or damage in accordance with the manufacturer's requirements; any such distortion or damage shall be basis for rejection of the materials.
- B. Equipment used for unloading shall be covered with wood or rubber to avoid damage to the exterior of the pipe, fittings and accessories. Do not drop or roll materials off trucks.
- C. The materials shall be inspected before and after unloading. Materials that are found to be cracked, chipped, gouged, dented, or otherwise damaged shall not be accepted.
- D. Interiors of pipe, fittings and specials shall be kept free from dirt and foreign matter.
- E. Store pipe and fittings on heavy wood blocking or platforms so they are not in contact with the ground.
- F. Pipe, fittings, and specials shall be unloaded opposite to or as close to the place where they are to be used as is practical to avoid unnecessary handling.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General

1. All products, including interior coatings, shall be suitable for use in a potable water system.

SECTION 331100 – BURIED PIPING INSTALLATION

2. All products, including wetted parts, shall be certified to meet NSF/ANSI Standard 61.

B. Pipe

Materials for the piping, joints and fittings shall be as specified in other related sections or as shown in the pipe schedule or on the Contract Drawings.

1. Pipe and appurtenances shall comply with the applicable standards for its type of material.
2. All pipes, fittings, valves, hydrants, specials, and accessories must be new materials in first-class condition. Used or recycled materials shall not be allowed, regardless of condition.
3. Piping for hydrant branches shall only be Class 53 ductile iron.
4. Piping within casing pipes (except for tree bores) and beneath pavement shall be either ductile iron pipe or prestressed concrete cylinder pipe as shown and as specified.
5. Piping in non-paved areas shall be either ductile iron pipe, prestressed concrete cylinder pipe, or PVC as shown and as specified.

C. Joints

Type of joints shall be as specified in other related Sections or as shown in the pipe schedule or as on the Contract Drawings.

D. Magnetic Pipe Marking Tape

Magnetic pipe marking tape as manufactured by C. H. Hanson Products, Paul Potter Warning Tape, or approved equal shall be installed above all new watermain.

1. Tape shall be 3 inches wide consisting of two (2) exterior plies of polyethylene with an aluminum alloy foil core.
2. Tape shall be blue color and labeled: "WATER" in black letters.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General

1. Excavation and backfilling shall be in accordance with the applicable provisions of Section 312317 - Excavation, Backfill, and Trenching.
2. Blocking will not be permitted under pipe, except where the pipe is to be laid with concrete cradle or encasement.
3. Pipe shall be installed on a layer of select material as shown on the Drawings to provide an acceptable bedding. The top of this layer shall then be considered the bottom of the trench.

SECTION 331100 – BURIED PIPING INSTALLATION

4. Pipe shall not be laid on bedrock without appropriate bedding stone.
5. No pipe shall be laid upon a foundation in which frost exists; or when there is danger of the formation of ice or the penetration of frost at the bottom of the excavation.
6. Bell holes shall be dug in the bottom of the trench to allow the pipe to have a firm bedding along the entire length of the pipe.
7. Temporary watertight bulkheads shall be placed in all open ends of pipe whenever pipe laying is not actively in process. The bulkheads shall be designed to prevent the entrance of dirt, debris, or water.
8. Precautions shall be taken to prevent the flotation of pipe in the event of water entering the trench.
9. Hydrant installation shall be as specified herein.

B. Location and Grade

1. Watermain and appurtenances shall be located as shown on the Contract Drawings or as directed and as established from the control survey in accordance with the General Requirements.
2. The alignment and grades shall be determined and maintained by a method acceptable to the ENGINEER.
3. Pipe shall be installed in straight horizontal trenches. “Snaking” of pipe by bending sections horizontally shall not be allowed.

C. Subgrade

The subgrade for pipelines shall be earth or bedding as specified or directed and shall be installed in accordance with Section 312317 - Excavation, Backfill and Trenching.

D. Joints

1. Joints shall be assembled using gaskets, lubricants and solvents as furnished by the pipe manufacturer and in accordance with the manufacturer’s recommendations.
2. Joint deflection shall not exceed 50% of manufacturer’s recommendations.

E. Bedding

Bedding shall be deposited and compacted in accordance with Section 312317 - Excavation, Backfill, and Trenching, and shall be as itemized below unless otherwise specified or directed.

1. For watermains:
 - a. The bedding shall be as specified in Section 310517, Select Granular Materials.
 - b. Bedding shall be deposited and tamped in 6-inch layers to the centerline of the pipe or to 6 inches above the pipe in paved or traveled areas.
 - c. Native material placed above the centerline of the pipe shall be deposited in such a manner as to not damage the pipe. Native material shall be suitable for backfill above the centerline of the pipe provided the

SECTION 331100 – BURIED PIPING INSTALLATION

materials are 2 inches in size or less. Native materials shall be suitable for backfill 6 inches above the pipe in non-paved areas provided the materials are 2 to 4 inches in size, but bedding is required to 6 inches above the pipe. Native materials greater than 4 inches are unacceptable for backfill.

F. Thrust Restraints

Thrust restraints for watermains shall be accomplished by the use of both thrust blocks and mechanical restraints for sizes through 12 inches. Joints for watermains 16 inches and larger shall have thrust restraints provided by harnessed joints only. Restraints shall be in the form of retainer glands; ductile iron locking segments with spigot weldment; or anchors of the size and type specified or as required by the pressure and stability of the supporting surface.

1. Thrust restraints shall be installed at all changes in direction, changes in size, dead ends or other locations where shown or directed.
2. Valves shall be treated as a bulkhead condition and pipe joints shall be restrained on both sides of the valve.
3. Cast in place concrete used for thrust restraints shall have developed the required strength prior to testing of the watermain.
4. When approved for use by ENGINEER, tie rods and nuts for thrust restraints shall be of high tensile steel and shall have a minimum yield strength of 70,000 psi.
 - a. Tie rods and nuts installed underground shall be coated with two coats of coal tar pitch preservative coating after installation.
 - b. Oil, grease, paint, or any coating which requires drying will not be acceptable.
5. All fire hydrant branches from the mainline tee to and including valve and hydrant shall be restrained.
6. All piping installed for interconnections shall be restrained.
7. All piping installed within casing pipes shall be restrained for the full length of the pipe installed within the casing pipe.
8. All piping installed within the limits of creek crossings shall be restrained for the full length of the creek crossing limits.

G. Concrete Thrust Blocks

1. Solid concrete blocks shall be used for proper blocking. Hollow concrete blocks or wooden blocking are not acceptable. Cast-in-place wet concrete mix shall be used for vertical bends and anchor collars.

H. Magnetic Pipe Marker

1. Magnetic pipe marker tape shall be placed above all new watermains as shown on the Drawings.
2. Magnetic pipe marker tape shall be tied to watermain valve boxes.

SECTION 331100 – BURIED PIPING INSTALLATION

3. Splices, where needed, shall be made in accordance with manufacturer's recommendations.
4. At completion of the project and before final payment is made, the CONTRACTOR shall test the entire length of the pipe using pipe locating equipment. Tests shall be made only in the present of the ENGINEER. Any section of tape not continuous or that is undetectable shall be removed and replaced at the CONTRACTOR'S expense.

3.02 CUTTING AND SPECIAL HANDLING

- A. Field cuts of pipes shall be in accordance with the manufacturer's instructions.
- B. Where a pipe requires special handling or installation it shall be in accordance with the applicable referenced standard.

3.03 INTERCONNECTIONS

- A. Perform interconnections as shown on the Contract Drawings.

3.04 ABANDONMENTS

A. Hydrants and Valves

1. Removal of existing and abandoned hydrants and valves shall be made with caution to prevent damage while being removed.
2. Return all existing and abandoned hydrants as specified or when directed to the Erie County Water Authority at 3030 Union Road, Cheektowaga, New York.
3. CONTRACTOR is responsible for unloading the abandoned hydrants at the Erie County Water Authority and placing the hydrants in the location specified by the AUTHORITY.
4. CONTRACTOR must deliver the hydrants during normal business hours and must schedule the delivery at least 48 hours in advance.
5. At all valves being abandoned, locate the valve, close the valve, remove the entire valve box, backfill and restore as shown on the Drawings.

B. Existing Watermains

1. No watermain abandonments shall be performed until the ENGINEER is satisfied that the new watermain is functional and meets all codes, standards, tests, and requirements.
2. Abandonments shall only be allowed after all service connections have been transferred to the new watermain, when applicable.
3. Perform the abandonments as shown on Contract Drawings.

SECTION 331100 – BURIED PIPING INSTALLATION

3.05 FIRE HYDRANTS

A. General

1. Install all hydrants and components in accordance with manufacturer's instructions.
2. The hydrant shall be set plumb with the center of the lowest nozzle between 15 inches and 18 inches above the finished grade or as specified by the ENGINEER. The pumper nozzle shall be oriented normal to the near edge of pavement.
3. The auxiliary valve shall be located as close to the main line as possible and at no time shall the center of the hydrant to the center of the auxiliary valve be less than 36 inches. The valve shall not be placed in pavement.
4. No part of the hydrant shall be closer than 2 feet to the face of the curb or 5 feet to the edge of the pavement where no curb exists or as per governing municipalities requirements.
5. All pipe connecting the main to the hydrant stem shall be 6 inch ductile iron pipe, fully restrained by use of anchor pipe or mechanical restraints as specified. Use of tie-rods shall be restricted to restraining existing conditions.
6. A drain pocket of clean No. 1 stone shall be provided as shown on the Drawings.
 - a. The granular material shall be extended above the hydrant drain.
7. Grease all hydrant nozzle threads after installation. The upper stem shall be lubricated with oil or grease. If grease is used, provide alemite fittings. Lubricate areas to be sealed from wet areas with "O" rings. Grease used shall be a food grade compound specially formulated for fire hydrants.
8. Install concrete block during hydrant installation for thrust restraint.

B. Inspection

1. All hydrants and valves will be inspected by the ENGINEER prior to installation. Damaged or defective materials will be rejected whether previously incorporated into the work or not.
2. Prior to the work in this section, the CONTRACTOR shall inspect the installation area to determine if the work of other trades has progressed to the point where the installation may properly commence.
3. The CONTRACTOR shall verify that the installation can proceed in accordance with all pertinent codes and regulations, the original design and the referenced standards.

C. Discrepancies

1. If the above referenced inspection reveals discrepancies, the CONTRACTOR shall notify the ENGINEER immediately.
2. The CONTRACTOR shall not proceed with the installation in areas of discrepancy until said discrepancy is resolved.

SECTION 331100 – BURIED PIPING INSTALLATION

- D. All interior wetted surfaces of fire hydrants except finished or bearing surfaces shall be shop painted in accordance with NSF/ANSI Standard 61 for potable water and applied in accordance with the manufacturers recommendations. Exterior surfaces shall be factory painted yellow and shall be repainted yellow in the field after installation with paint meeting the requirements of this specification.

3.06 TESTING

A. General

Performance testing, leakage, hydrostatic, and proof-of-design tests shall be as specified in Section 331301 - Testing and Disinfection.

B. Testing Criteria

Test pressure shall be 170 psi.

C. Ultrasonic Joint Testing.

1. Each joint shall, at the CONTRACTOR'S sole cost and expense, be tested with ultrasonic test equipment prior to being backfilled. If a leak is detected, corrective action shall be taken prior to installing the next pipe.
2. The fact that a point (or joints) has passed the ultrasonic testing does not waive the requirements for the hydrostatic tests described in Section 331301.
3. The testing equipment shall be as manufactured by Moffat Enterprises of Powell Butte, or equal.

3.07 DISINFECTION

- A. All watermains, hydrant branches, blow-offs, and ARV piping shall be tested and disinfected in accordance with Section 331301 - Testing and Disinfection.

3.08 GENERAL

- A. Install watermain, fittings, and accessories in accordance with applicable sections; as shown on the drawings; and, as specified, required, or directed.

B. Tapping Information

1. All materials as specified herein shall be installed by or under the direction of personnel who are acceptable to the Authority.
 - a. Threaded taps shall be made using a machine designed for cutting, threading and inserting the corporation without interruption of service.
 - 1) Teflon tape may be used on corporation threads.

SECTION 331100 – BURIED PIPING INSTALLATION

- b. Tapping sleeve connections shall be made using a machine to cut and remove the segment through the valve without interruption of service.
 2. Valve boxes shall be set plumb and shall be independently supported on concrete blocking so no weight will be transmitted to the curb stop or watermain.
 3. Service saddles and tapping saddles installed on prestressed concrete cylinder pipe shall be encased in a minimum of 2 inches of concrete mortar after installation.
 4. Service saddles shall be used under the following condition:
 - a. When water services are placed on 4-inch or smaller pipes.
 - b. When water services larger than 1-inch are placed on a 6-inch pipe.
 - c. When water services larger than 1-¹/₂-inch are placed on an 8-inch pipe.
 - d. When water services are tapped to all plastic (PVC) pipe.
 - e. When services larger than 1-¹/₂-inch are placed on ductile iron pipe.
 - f. When water services are tapped to all asbestos-cement pipe.
 5. CONTRACTOR is not allowed to excavate, disturb, or park any equipment beyond the Right-of-Way line without prior approval from the property owner.
 6. If minimum depth is not achieved for the water service at any location, CONTRACTOR shall either excavate and lower the service or repush/drill the service to the minimum depth, at his expense, until a satisfactory service is installed.
 7. Curb boxes are not allowed to be cut for any reason.
 8. Repair or replace any connections, which are leaking to ensure awatertight connection.
- C. Tapping Watermain.
 1. Wet tap connections to existing watermains shall be as shown on the drawings.
 2. The person or firm who will be performing the watermain tap shall be acceptable to the Authority.
 3. Prior to ordering the tapping sleeve, the CONTRACTOR shall excavate a test pit to the depth required and expose the main to be taped to accurately measure the outside diameter of the main. No tapping sleeve shall be ordered until this information has been obtained.
 4. Tapping sleeves shall be suitable for use with the existing pipe to be tapped. Tapping sleeve shall be compatible with the tapping valve furnished.
 5. Thrust blocks shall be constructed behind the wet tap connection as shown on the drawings and specified herein.
 6. Refer to Section 331301 for additional requirements for tapping sleeve and valve testing.
 7. After each tap has been completed, the CONTRACTOR shall keep the tapping area uncovered for a minimum period of one (1) hour to determine if any leakage is occurring. If any leakage has occurred, the tap shall be made watertight in a manner approved by the ENGINEER.
 8. A full pipe coupon shall be retained as a result of the tapping operation.

SECTION 331100 – BURIED PIPING INSTALLATION

9. The valves shall be kept closed until approval from the ENGINEER is given to open the valve.

C. Discrepancies

1. If discrepancies occur between the Drawings and field conditions, the CONTRACTOR shall notify the ENGINEER immediately.
2. The CONTRACTOR shall not proceed with the installation in areas of discrepancy until said discrepancy is resolved.

END OF SECTION

SECTION 331301 – TESTING AND DISINFECTION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Specified

1. Testing and disinfection of all pressure piping for leakage as specified.
 - a. The CONTRACTOR shall furnish all labor, equipment, test connections, vents, water and materials necessary for carrying out the pressure and leakage tests as specified and required.
 - b. The work specified shall include all labor, material, equipment, services and incidentals necessary to fill, clean, chlorinate, flush, and test all pipelines which will carry or hold potable water.

B. Related Work Specified Elsewhere

1. Section 331100 - Buried Piping Installation

C. Description

1. Permission shall be obtained from the OWNER of the water system before the use of water from any existing system. The CONTRACTOR shall:
 - a. Conform to the requirements of the OWNER.
 - b. Pay all costs connected with the taking or use of water for any retesting.
 - c. The CONTRACTOR shall provide written notice to the Authority and ENGINEER at least three working days in advance of testing and disinfection.
2. All work under this section shall be performed in the presence of the ENGINEER. A representative of the public health authority having jurisdiction must also be present, as required.
3. Chlorination shall be scheduled such that sampling and flushing will be performed during normal business hours.

1.02 QUALITY ASSURANCE

A. Reference Standards

1. AWWA B300, Standard for Hypochlorites
2. AWWA B301, Standard for Liquid Chlorine
3. AWWA C104, Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water
4. AWWA C301, Prestressed Concrete Pressure Pipe, Steel-Cylinder Type for Water and Other Liquids

SECTION 331301 – TESTING AND DISINFECTION

5. AWWA C502, Standard for Dry-Barrel Fire Hydrants
6. AWWA C504, Standard for Rubber Seated Butterfly Valves
7. AWWA C600, Standard for Installation of Ductile Iron Watermains and Their Construction
8. AWWA C651, Standard for Disinfecting Water Mains
9. AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch Through 12-inch for Water Distribution
10. NSF/ANSI Standard 60 and 61 (as applicable)
11. Standard Methods for the Examination of Water and Wastewater, latest edition
12. 1996 Safe Drinking Water Act

1.03 SUBMITTALS

- A. The CONTRACTOR shall submit proposed materials, methods, and operations regarding testing and disinfection to the ENGINEER for review prior to the start of testing.
- B. CONTRACTOR must provide a sketch to the ENGINEER of the sampling locations identifying at minimum the following:
 1. Street names,
 2. North arrow,
 3. Sampling locations,
 4. House numbers of nearest buildings to sampling locations.
 5. Other distinguishable landmarks,
 6. Any other information as requested by ENGINEER, OWNER, AUTHORITY, or County Health Department.
- C. The CONTRACTOR shall submit certification that all backflow preventers (Reduced Pressure Zone attachments) and pressure gauges have been tested and certified within the last year.
- D. Qualifications of laboratory analyzing biological samples shall be New York State ELAP certified.
- E. Chain-of-Custody forms are to be furnished for all biological samples taken.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All products must be suitable for use in a potable water system and NSF-60 certified. All piping, valves, etc. shall be NSF-61 certified.
- B. Chlorination shall be by the use of a solution of sodium hypochlorite contained in the pipe or structure as specified. The use of calcium hypochlorite in powdered, granular, or tablet form, shall not be allowed.

SECTION 331301 – TESTING AND DISINFECTION

PART 3 - EXECUTION

3.01 TESTS ON PRESSURE PIPING FOR POTABLE WATER

A. General

1. Flush, test and disinfect prior to connection to existing watermains as specified below, except as otherwise authorized by the ENGINEER.
2. The length of piping and sections included in the tests shall meet the approval of the ENGINEER; however, the length shall not exceed 2,000 feet in any case. Pressure test of pipe section shall be from valve to valve regardless of watermain size.
3. Notify the ENGINEER 72 hours in advance of testing.
4. Equipment in or attached to the pipes being tested shall be protected. Any damage to such equipment during the test shall be repaired by the CONTRACTOR at his expense.
5. Conduct all tests per AWWA C-600 and C-651, latest editions in the presence of the ENGINEER. Repeat tests in the presence of local authorities having jurisdiction if required by them.
6. CONTRACTOR shall have sufficient personnel at the site for the entire duration of all tests.
7. When piping is to be insulated or concealed in a structure, tests shall be made before the pipe is covered.
8. Provide outlets to flush line, expel air and perform specified tests.
9. Where connections to existing lines are called for only one such connection will be allowed.
10. All fittings, hydrants and appurtenances must be properly braced and harnessed before the pressure is applied. Thrust restraining devices which will become a part of the system must also be tested at the test pressure.
11. When testing absorbent pipe materials such as cement or concrete, the pipeline shall be filled with water at least 24 hours before the test is made.
12. The CONTRACTOR must supply all materials and manpower to perform the tests as specified herein.
13. Testing and disinfection shall be acceptable and approved by the agency of jurisdiction before another connection is made.

B. Initial Flushing

1. CONTRACTOR shall fill and flush new main to remove dirt and miscellaneous debris from the inside of the watermain.
2. CONTRACTOR is responsible for removing all entrapped air during flushing.
3. Flushing must have sufficient flowrate to achieve a fluid velocity of 2.5 feet per second inside the waterline.
4. A minimum 2" tap is required for proper flushing of all watermains having a diameter of 8 inches or less.
5. Refer to AWWA C651, for number of taps required to obtain the minimum 2.5 feet per second flow velocity in pipes larger than 8 inches in diameter.

SECTION 331301 – TESTING AND DISINFECTION

6. CONTRACTOR is responsible for providing a water source for flushing. With the permission of the OWNER, an existing watermain may be used as a water source, however, the following restrictions apply:
 - a. The CONTRACTOR is not allowed to operate any valves or hydrants or operate any components which belong to the OWNER.
 - b. If water is drawn from the existing system, an appropriate backwater preventer such as a Reduced-Pressure Zone (RPZ) device must be used. The RPZ must be tested within one (1) year and approved prior to usage.
 - c. Water from flushing procedures must be disposed of properly. Water may be piped or gravity-fed to an existing storm sewer with the ENGINEER'S and the OWNER'S permission if proper erosion control methods to minimize sediment build-up are used. Discharge of water into a roadway is strictly prohibited.
7. CONTRACTOR shall partially open and close valves and hydrants several times under expected line pressure to flush foreign material out of the valves and hydrants.

C. Pressure Test

1. Pressure test apparatus must be installed as shown on the Drawings
2. Test pressure shall be as specified in Section 331100, Buried Piping Installation, at the lowest point in the line.
3. Test pressure shall be held on the piping for a period of at least 2 hours, unless a longer period is requested by the ENGINEER. Pressure should not fluctuate by more than 5 psi during testing.
4. Pressure gauge must be in good working condition and must be demonstrated to be accurate to the ENGINEER prior to any testing.
5. Gauge must have proper labeling to allow ENGINEER to accurately distinguish the maximum allowable 5 psi change in pressure. Gauge must have markings at no greater than 2 psi increments to allow accurate readings.
6. ENGINEER may tap pressure gauge at each reading to ensure needle is measuring pressure accurately.
7. ENGINEER shall record pressure at 15 or 30 minute intervals to help determine if the pressure loss is stabilizing.
8. The CONTRACTOR will inform the ENGINEER when to begin the test.
9. If the pressure drop is greater than 5 psi in 2 hours, or if the ENGINEER believes the line is suspect, the CONTRACTOR shall explore for the cause of the excessive leakage and after repairs have been made, the line shall be retested. This procedure shall be repeated until the pressure loss is less than the maximum allowable and the ENGINEER is satisfied.
10. If the pressure drop is 3 psi or greater but less than 5 psi in 2 hours, the CONTRACTOR shall continue the test for another 2 hours. If the pressure drop over the 4 hour period is greater than 5 psi, the test failed and must be repeated after the cause of the leakage is explored and the necessary repairs have been made
11. The ENGINEER shall make a preliminary determination if the test passes or fails based on the pressure and volume losses recorded during testing.

SECTION 331301 – TESTING AND DISINFECTION

12. After each test, the CONTRACTOR must demonstrate that the test apparatus, including the pressure gauge, is fully functional and accurate. Inaccurate gauges or non-satisfactory equipment will be grounds for test failure, regardless of test results. CONTRACTOR will resupply proper equipment and retest, at his expense.
13. The pressure loss recorded over the 2 or 4-hour test must be acceptable to the County Health Department and AUTHORITY for final hydrostatic testing approval to be given.

D. Leakage Test

1. The leakage test shall be conducted concurrently with the pressure test.
2. The rate of leakage shall be determined at 15-minute intervals by means of volumetric measurement of the makeup water added to maintain the test pressure. The test shall proceed until the rate of leakage has stabilized or is decreasing below an allowable value, for three consecutive 15-minute intervals. After this, the test pressure shall be maintained for at least another 15 minutes.
 - a. At the completion of the test the pressure shall be released at the furthestmost point from the point of application.
3. All exposed piping shall be examined during the test and all leaks, defective material or joints shall be repaired or replaced before repeating the tests.
4. The leakage for pressure pipelines shall not exceed the following allowable rates in gallons per hour per 1000 feet of pipe at the test pressure specified in Section 331100, Buried Piping Installation:

<u>Pipe Diameter</u>	<u>Pipe Material</u>	<u>ECWA Allowable Leakage*</u>
4"	PVC, DI	0.29
6"	PVC, DI	0.40
8"	PVC, DI	0.59
10"	PVC, DI	0.74
12"	PVC, DI	0.88
16"	DI, PCCP	1.17
20"	DI, PCCP	1.47
24"	DI, PCCP	1.76
42"	PCCP	2.77

* 75% of allowable leakage per AWWA C600, rev.10.

5. Regardless of the above allowables, any visible leaks shall be permanently stopped.
6. The CONTRACTOR shall provide a meter certified within the last year or a source-water tank/barrel of small enough cross section so that measurable changes in water depth can be accurately recorded. If the change in water depth cannot be properly measured, the ENGINEER may require the test to be run more than 2 hours until an accurate depth change can be recorded and the ENGINEER is satisfied with the results.

SECTION 331301 – TESTING AND DISINFECTION

7. The leakage volume recorded over the 2 or 4-hour test must be acceptable to the County Health Department and AUTHORITY for final waterline approval to be given.

3.02 BUTTERFLY VALVE TESTING

- A. Each butterfly valve shall have a field leakage test performed with the pressure differential as identified in Section 331100, Buried Piping Installation, applied in both directions. This requirement does not waive the requirements stipulated in AWWA C504.
- B. The duration of each field test in each direction shall be a minimum of two (2) hours.
- C. The CONTRACTOR shall demonstrate to the ENGINEER'S satisfaction that all system components operate correctly, both individually and as a system. All testing equipment and materials required to perform all tests shall be provided by the CONTRACTOR and demonstrated as functional and accurate to the ENGINEER. Non-functional or inaccurate equipment, regardless of test results, will be grounds for test failure. CONTRACTOR shall resupply proper equipment and retest.

3.03 RESILIENT SEAT GATE VALVE TESTING

- A. Each gate valve shall have a field leakage test performed with the pressure differential as identified in Section 331100, Buried Piping Installation, applied in both directions. This requirement does not waive the requirements stipulated in AWWA C509.
- B. The duration of each field test in each direction shall be a minimum of two (2) hours unless specifically defined by the ENGINEER.
- C. The CONTRACTOR shall demonstrate to the ENGINEER'S satisfaction that all system components operate correctly, both individually and as a system. All testing equipment and materials required to perform all tests shall be provided by the CONTRACTOR and demonstrated as functional and accurate to the ENGINEER. Non-functional or inaccurate equipment, regardless of test results, will be grounds for test failure. CONTRACTOR will resupply proper equipment and retest.

3.04 TAPPING SLEEVE AND VALVE TESTING

- A. Prior to making the tap, gate valves shall have a field leakage test performed with a hydrostatic pressure as identified in Section 331100, Buried Piping Installation, on the open end.
- B. Once the system is complete, the valves shall be tested in accordance with the Butterfly and Resilient Seat Gate Valve Testing criteria stated above.
- C. The duration of each field test shall be a minimum of two (2) hours unless specifically defined by the ENGINEER.

SECTION 331301 – TESTING AND DISINFECTION

- D. After installation of the tapping sleeve or saddle and prior to tapping the main, the sleeve or saddle shall be air tested in accordance with manufacturer's recommendations. If the results of the air test do not meet manufacturer's specifications, the sleeve or saddle will be replaced and retested until the results are satisfactory.
- E. The CONTRACTOR shall demonstrate to the ENGINEER'S satisfaction that all system components operate correctly, both individually and as a system. All testing equipment and materials required to perform all tests shall be provided by the CONTRACTOR and demonstrated as functional and accurate to the ENGINEER. Non-functional or inaccurate equipment, regardless of test results, will be grounds for test failure. CONTRACTOR will resupply proper equipment and retest.

3.05 DISINFECTION

- A. Before disinfection, the line shall be cleaned and flushed with clean water as defined in the Initial Flushing section. CONTRACTOR shall provide outlets as required.
- B. The chlorine solution shall be admitted to pipelines through corporation stops placed in the horizontal axis of the pipe, to structures by means of tubing extending directly into the structure or other approved methods.
- C. CONTRACTOR shall install 2-inch saddles on existing and proposed mains and run 2-inch Type K copper tubing with backflow prevention device to allow for addition of chlorinated water. The rate of chlorine solution flow shall be in such proportion to the rate of water entering the pipe or structure that the resulting free chlorine residual shall be between 50 and 100 milligrams per liter (mg/l). Concentrations over 100 mg/l shall not be allowed to enter the piping system.
- D. The placement of chlorine powder or tablets inside the pipe during installation as a means of disinfection will not be allowed.
- E. The proposed piping shall be tested in all respects, prior to connecting the second end of the pipe to the existing system and prior to installing the annular fill at casing pipes.
- F. All valves to existing mains must be closed during the chlorination process. CONTRACTOR must flush the proposed main through a backflow preventer such as a Reduced Pressure Zone (RPZ) and 2-inch copper until chlorine residual at the opposite end reaches 50 mg/l. All valves to the existing water network are to remain closed until this level is reached. While the chlorinated water is being added, all appurtenances on the main shall be operated so as to completely disinfect the new work. The operation shall be repeated as necessary to provide complete disinfection.
- G. Chlorinated water from hydrants and taps must be properly collected and disposed of by the CONTRACTOR. Discharge of chlorinated water into the existing storm sewer or a natural water body shall not be allowed.

SECTION 331301 – TESTING AND DISINFECTION

- H. The chlorine treated water shall be retained in the pipe or structure at least 24 hours, unless otherwise directed. During the retention period all valves and hydrants within the treated sections shall be operated.
- I. The chlorine residual shall be not less than 25 mg/l at any point in the pipe or structure at the end of the retention period. CONTRACTOR shall immediately perform final flushing to reduce the retention time high levels of chlorinated water.
- J. When making repairs to or when specified, structures and portions of pipelines shall be chlorinated by a concentrated chlorine solution containing between 200 mg/l and 300 mg/l of free chlorine. The solution shall be applied with a brush or sprayed on the entire inner surface of the empty pipes or structures. The surfaces disinfected shall remain in contact with the strong chlorine solution for at least 30 minutes.
- K. The CONTRACTOR must use an approved test method to determine chlorine levels. Test strips will be allowed for testing chlorine levels if the kit is new, in the original bottle, and has a color coded scale on the side with legible concentrations defined. Sending samples to an approved laboratory is also acceptable.

3.06 FINAL FLUSHING

- A. Upon completion of each disinfecting operation, the CONTRACTOR will be required to empty the contents of the pipe into a tank truck. Dumping into a sewer will only be allowed with approval from the local governing body. In no instance will chlorinated testing or flushing water be emptied onto the roadways, in ditches, culverts, streams, wetlands, or any other natural water body.
- B. Final flushing will continue until such time as the chlorine residual is between 0.5 and 1.2 mg/l.

3.07 BACTERIOLOGICAL TESTING

- A. After disinfection and final flushing, a representative of the laboratory hired by the CONTRACTOR shall, in the presence of the ENGINEER, take two bacteriological samples from sampling points at approximately 1000-foot intervals and at each end of the test section (one immediately after final flushing and a second one after 24 hours) for testing by an ELAP certified laboratory in accordance with the latest Health Department requirements.
- B. Should acceptable results not occur after these two consecutive tests, the CONTRACTOR shall, at his expense, repeat the disinfection procedure until safe results are obtained.
- C. All precautions shall be taken to maintain dry and sanitary conditions and to prevent contamination of any piping, at the CONTRACTOR'S expense.
- D. If, in the opinion of the ENGINEER, contamination has occurred, the CONTRACTOR shall repeat the disinfection and bacteriological testing at his cost and expense.

SECTION 331301 – TESTING AND DISINFECTION

- E. After reconnecting the proposed piping to the existing piping, the CONTRACTOR shall slowly refill the watermain with water and allow it to pressurize so that the ENGINEER may inspect the connections and/or other piping.
- F. The CONTRACTOR shall, at his expense, correct any observed defects to the satisfaction of the ENGINEER and OWNER.

3.08 APPROVAL

- A. The ENGINEER shall submit the Waterline Installation Complete Works Approval Report(s) to the Erie County Water Authority for approval.

END OF SECTION

SECTION 331301 – TESTING AND DISINFECTION

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SECTION 334600 - SUBDRAINAGE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Building perimeter drainage system.
2. Slab-on-grade drainage system.
3. Filter aggregate and fabric.
4. Bedding.

B. Related Sections:

1. Section 055000 - Metal Fabrications: Access covers and frames in floor slab to cleanouts in weep drainage system.
2. Section 310516 - Aggregates for Earthwork.
3. Section 312316 - Excavation: Excavating for site subdrainage system piping and surrounding filter aggregate.
4. Section 312323 - Fill: Backfilling over filter aggregate, up to subgrade elevation and underside of fill under floor slab.

1.02 REFERENCES

A. ASTM International:

1. ASTM D2729 - Standard Specification for Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Shop Drawings: Indicate dimensions, layout of piping, high and low points of pipe inverts and gradient of slope between corners and intersections.
- C. Product Data: Submit data on pipe drainage products and pipe accessories.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.04 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record location of pipe runs, connections, cleanouts and principal invert elevations.

SECTION 334600 - SUBDRAINAGE

- C. Operation and Maintenance Data: Procedures for submittals.

PART 2 - PRODUCTS

2.01 PIPE MATERIALS

- A. Furnish materials in accordance with New York State Department of Transportation standards.
- B. Corrugated Plastic Tubing: Flexible type; 4 inch diameter, with required fittings.
- C. Use perforated pipe at subdrainage system; unperforated through sleeved walls.

2.02 AGGREGATE AND BEDDING

- A. Filter Aggregate and Bedding Materials: Fill Type A3 as specified in Section 310516.

2.03 ACCESSORIES

- A. Pipe Coupling: Solid plastic.
- B. Filter Fabric: Water pervious type, black polypropylene.
- C. Pipe Sleeve: Plastic type for foundation wall.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify excavated base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with Type A2 aggregate.
- B. Remove large stones or other hard matter which could damage drainage piping or impede consistent backfilling or compaction.

3.03 INSTALLATION

- A. Place drainage pipe on clean cut subsoil.

SECTION 334600 - SUBDRAINAGE

- B. Lay pipe to slope gradients noted on Drawings; with maximum variation from indicated slope of 1/8 inch in 10 feet.
- C. Place pipe with perforations facing down. Mechanically join pipe ends.
- D. Install pipe couplings.
- E. Install Type A3 aggregate at sides, over joints and top of pipe. Install top cover compacted thickness of 12 inches.
- F. Place filter fabric over leveled top surface of aggregate cover prior to subsequent backfilling operations.
- G. Place aggregate in maximum 6 inch lifts, consolidating each lift.
- H. Refer to Section 312323 for compaction requirements. Do not displace or damage pipe when compacting.
- I. Connect to storm sewer system with unperforated pipe , through installed sleeves.

3.04 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Request inspection prior to and immediately after placing aggregate cover over pipe.

3.05 PROTECTION OF INSTALLED CONSTRUCTION

- A. Section 017000 - Execution and Closeout Requirements: Protecting installed construction.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation begins.

END OF SECTION

SECTION 334600 - SUBDRAINAGE

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DIVISION 40

PROCESS INTERCONNECTIONS

SECTION 400507 - HANGERS AND SUPPORTS FOR PROCESS PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Pipe hangers and supports.
2. Hanger rods.
3. Structural attachments.
4. Pipe guides.
5. Formed steel channel.

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories: Execution requirements for placement of inserts and sleeves in concrete forms specified by this Section.
2. Section 033000 - Cast-in-Place Concrete: Execution requirements for placement of concrete housekeeping pads specified by this Section.
3. Section 099000 - Painting and Coating: Product and execution requirements for painting specified by this Section.
4. Section 400519 - Ductile Iron Process Pipe.
5. Section 400551 - Common Work Results for Process Valves: Common product requirements for valves for placement by this Section.

1.02 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASME B31.1 - Power Piping.
2. ASME B31.9 - Building Services Piping.

B. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel. ASTM A47 - Standard Specification for Ferritic Malleable Iron Castings.
2. ASTM A576 - Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality.

C. ASTM A181 - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.

D. American Welding Society:

1. AWS D1.1 - Structural Welding Code Steel - Reference Manual.

SECTION 400507 - HANGERS AND SUPPORTS FOR PROCESS PIPING

- E. Manufacturers Standardization Society of the Valve and Fittings Industry:
 - 1. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacturer, Selection, Application, and Installation.

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with piping and equipment connections specified in other Sections and indicated on Drawings.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer's catalog data including load capacity.
- C. Shop Drawings: Indicate critical dimensions, sizes, and pipe hanger and support locations - and detail of trapeze hangers, anchors, and guides.
- D. Manufacturers' Instructions: Submit special procedures and assembly of components.
- E. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and/or fabricator.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years' documented experience.
- B. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on-Site in original factory packaging, labeled with manufacturer's identification.
- C. Protect products from weather and construction traffic, dirt, water, chemical, and damage by storing in original packaging.

SECTION 400507 - HANGERS AND SUPPORTS FOR PROCESS PIPING

1.07 AMBIENT CONDITIONS

- A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition
- B. Provide ventilation in areas receiving solvent-cured materials.

1.08 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
 - 1. Globe Pipe Hanger Products
 - 2. Hilti, Inc.
 - 3. NIBCO Inc.
 - 4. Or equal.
- B. Description:
 - 1. Conform to ASME B31.9 and MSS SP58.
 - 2. Provide means of vertical adjustment after erection.
 - 3. Pipe Sizes 2 in and Larger: ASTM A36, steel, adjustable, clevis.
 - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 - 5. Wall Support for Pipe Sizes 3 in and Smaller: Cast iron J-hook.
 - 6. Wall Support for Pipe Sizes 4 in and Larger: Welded steel bracket.
 - 7. Vertical Support: Riser clamp.
 - 8. Floor Supports: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- C. Performance and Design Criteria:
 - 1. Riser Supports: Support risers on each floor with riser clamps and lugs, independent of connected horizontal piping.
 - 2. Point Loads:
 - a. Support plastic piping containing meters, valves, appurtenances, and other point loads on both sides.
 - b. Avoid point loads on plastic piping by providing extra wide pipe saddles or galvanized steel shields.

SECTION 400507 - HANGERS AND SUPPORTS FOR PROCESS PIPING

2.02 HANGER RODS

- A. Hanger Rods:
 - 1. ASTM A576, steel.
 - 2. All-thread.
 - 3. Diameter: ASME B31.1.

2.03 FORMED STEEL CHANNEL

- A. Description:
 - 1. Galvanized 12-gage-thick steel.
 - 2. Include holes 1-1/2 in o.c.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Requirements for installation examination.
- B. Verify field dimensions as indicated on Shop Drawings.

3.02 INSTALLATION

- A. Obtain permission from Engineer before using powder-actuated anchors.
- B. Obtain permission from Engineer before drilling or cutting structural members.
- C. Pipe Hangers and Supports:
 - 1. Install according to: ASME 31.9.
 - 2. Support horizontal piping as indicated on Drawings.
 - 3. Install hangers with minimum 1/2 in space between finished covering and adjacent Work.
 - 4. Place hangers within 12 in of each horizontal elbow.
 - 5. Use hangers with 1-1/2 in minimum vertical adjustment.
 - 6. Support riser piping independently of connected horizontal piping.
 - 7. Support piping independently so that equipment is not stressed by piping weight or expansion in piping system.
 - 8. Provide welded steel brackets where piping is to be run adjacent to building walls or columns.
- D. Equipment Bases and Supports:
 - 1. Provide housekeeping pads as detailed on Drawings.

SECTION 400507 - HANGERS AND SUPPORTS FOR PROCESS PIPING

2. Using templates furnished with equipment, install anchor bolts and accessories for mounting and anchoring equipment.
3. Provide rigid anchors for pipes after vibration isolation components are installed.

E. Prime Coat:

1. Prime coat exposed steel hangers and supports.
2. Conform to Section 099000 - Painting and Coating.
3. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

END OF SECTION

SECTION 400507 - HANGERS AND SUPPORTS FOR PROCESS PIPING

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SECTION 400519 – DUCTILE IRON PROCESS PIPE

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Ductile iron pipe and fittings.
2. Accessories.

B. Related Requirements:

1. Section 099000 - Painting and Coating: Product and execution requirements for painting specified by this Section.
2. Section 331301 – Piping Testing and Disinfection.
3. Section 400513 - Common Work Results for Process Piping: Piping components, appurtenances, and identification requirements common to process piping systems.
4. Section 400507 - Hangers and Supports for Process Piping and Equipment: Hangers, anchors, sleeves, and sealing of piping to adjacent structures.
5. Section 400523 - Common Work Results for Process Valves: Common product requirements for valves for placement by this Section.

1.02 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings.
2. ASME B31.3 - Process Piping Design.

B. ASTM International:

1. ASTM A48 - Standard Specification for Gray Iron Castings.

C. American Water Works Association:

1. AWWA C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
2. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings.
4. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C115/A21.15 – Flanged Ductile Iron Pipe with Ductile-Iron or Gray Iron Threaded Flanges.
6. AWWA C150/A21.50 - Thickness Design of Ductile-Iron Pipe.
7. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast.
8. AWWA C153/A21.53 - Ductile-Iron Compact Fittings.
9. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.

SECTION 400519 – DUCTILE IRON PROCESS PIPE

D. The Society for Protective Coatings:

1. SSPC-SP 6/NACE No. 3 - Commercial Blast Cleaning.

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with piping and equipment connections specified in other Sections and indicated on Drawings.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturer's catalog information on pipe materials and fittings.
- C. Shop Drawings: Indicate layout of piping systems, including equipment, critical dimensions, sizes, and materials lists.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Qualifications Statements:
 1. Submit qualifications for manufacturer.

1.05 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

1.06 QUALIFICATIONS

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

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Deliver materials in manufacturer's packaging, including handling instructions.
- C. Inspection: Accept piping and appurtenances on-Site. Inspect for damage.
- D. Store piping and appurtenances according to manufacturer's instructions.

SECTION 400519 – DUCTILE IRON PROCESS PIPE

- E. Protect piping and appurtenances from oxidation by storing off the ground.

1.08 EXISTING CONDITIONS

- A. Field Measurements: Verify field measurements prior to fabrication.

PART 2 - PRODUCTS

2.01 DUCTILE IRON FLANGED PIPE AND FITTINGS

- A. Ductile Iron Pipe with Threaded Flanges:

1. Pipe shall be centrifugally cast ductile iron conforming to the requirements of AWWA C151 and C115 for material, dimensions, tolerance, tests, markings, and other requirements.
2. Pipe barrels and flanges shall have a taper pipe thread (NPT) in accordance with ANSI B1.20.1, with pipe diameters adapted to ductile iron pipe standard outside diameters.
3. Flanged pipe shall be minimum Class 53 thickness.
4. Manufacturer:
 - a. American Cast Iron Pipe Co.
 - b. Clow - A Division of McWane, Inc.
 - c. US Pipe
 - d. Atlantic States, Inc.
 - e. Griffin Pipe

- B. Ductile Iron Flanged Fittings:

1. Tees, bends, elbows, reducers, increasers and other such fittings shall be flanged ductile iron in accordance with the requirements of AWWA C110 and shall conform to ANSI A21.10, 250 psi rating.
2. Reducers shall be eccentric unless otherwise specified.
3. Manufacturer:
 - a. American Cast Iron Pipe Co.
 - b. Clow - A Division of McWane, Inc.
 - c. Griffin
 - d. Tyler - A Division of McWane, Inc.
 - e. US Pipe

- C. Joints for Ductile Iron Flanged Pipe and Fittings:

1. Flanged joints shall conform to the requirements of AWWA C110 and drilling and facing of flanges shall be in accordance with ANSI B16.1 Class 125 flanges unless otherwise specified.

SECTION 400519 – DUCTILE IRON PROCESS PIPE

2. Flanged ductile iron pipe and fittings shall be furnished complete with all necessary joint accessories consisting of natural or synthetic rubber gaskets, 1/8-inch thick, full face; and, nuts, bolts and washers, unless otherwise specified.
3. All nuts, bolts and washers for flanges and accessories shall conform to ANSI B18.2.1 and ANSI B18.2.2, respectively and shall be low carbon steel in conformance with ASTM A307, grade B or fluorocarbon coated as specified herein.

2.02 RESTRAINED FLANGED ADAPTERS

- A. Restraint shall be accomplished by use of a gland that incorporates wedges that increase their resistance to pull out as pressure or external forces increase.
- B. The restrained flange adapter shall be comprised of two rings made of ductile iron conforming to ASTM A536.
- C. The restraining ring shall be suitable for flanges conforming to AWWA C115 flange drilling.
- D. Nuts and bolts shall be fluorocarbon coated or Type 304 stainless steel, high strength, low alloy.
- E. Torque limiting twist off nuts shall be used to insure the proper actuation of the wedges. When the nut is sheared off, a standard hex head shall remain.
- F. Provide fusion bonded epoxy coating on the gasket ring and shop primer on the body.
- G. Restrained flange adapter shall be suitable for use on ductile iron pipe.
- H. Manufacturer:
 1. EBAA Iron, Series 2100 MEGAFLANGE,
 2. Or equal.

2.03 FINISHES

- A. Cement-mortar lining, AWWA C104; double thickness.
- B. Outside Coating:
 1. Exposed: As specified in Section 099000 - Painting and Coating.

2.04 ACCESSORIES

- A. Flange Fillers, Blind Flanges and Reducing Companion Flanges:
 1. Conform to the requirements of AWWA C115 for material, dimensions, tolerance, tests, markings and other requirements.

SECTION 400519 – DUCTILE IRON PROCESS PIPE

2. Drilling and facing of flanges shall be in accordance with ANSI B16.1, Class 125 flanges unless otherwise specified.
3. Flanged fillers, blind flanges and reducing companion flanges shall be furnished complete with all necessary joint accessories consisting of natural or synthetic rubber gaskets, 1/8-inch thick, full face; and, nuts, bolts and washers, unless otherwise specified.
4. Threaded outlets or taps, (Mueller threads), shall be provided in blind flanges as specified or required.
5. All nuts, bolts and washers for flanges and accessories shall conform to ANSI B18.2.1 and ANSI B18.2.2, respectively and shall be Type 304 stainless steel, high strength, low alloy steel.

B. Caps and Plugs:

1. Conform to the requirements of AWWA C110 for material, dimensions, tolerance, tests, markings and other requirements.
2. Caps and plugs shall be mechanical joint or push-on joint and be furnished with all necessary joint accessories consisting of ductile iron follower glands, plain tipped rubber gaskets, nuts and bolts, unless otherwise specified.
3. All nuts and tee bolts for mechanical joint accessories shall be fluorocarbon coated as specified herein.
4. Threaded outlets or taps, (Mueller threads), shall be provided in plugs and caps as specified or required.

2.05 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that field dimensions are as indicated on Drawings.
- C. Inspect existing flanges for nonstandard bolt hole configurations or design, and verify that new pipe and flange mate properly.

3.02 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Thoroughly clean pipe and fittings before installation.

SECTION 400519 – DUCTILE IRON PROCESS PIPE

C. Surface Preparation:

1. Touch up shop-primed surfaces with primer as specified in Section 099000 - Painting and Coating.
2. Solvent-clean surfaces that are not shop primed.
3. Clean surfaces to remove loose rust, mill scale, and other foreign substances by power tool cleaning; prime surface as specified in Section 099000 - Painting and Coating.

3.03 INSTALLATION

A. Exposed Service:

1. Run piping straight along alignment indicated on Drawings with minimum number of joints.
2. Install according to ASME B31.3.
3. Fittings:
 - a. Clean gasket seats thoroughly, and wipe gaskets clean prior to installation.
 - b. Install fittings according to manufacturer's instructions.
 - c. Tighten bolts progressively, drawing up bolts on opposite sides until bolts are uniformly tight; use torque wrench to tighten bolts to manufacturer's recommendations.
4. Provide required upstream and downstream clearances from devices as indicated.

B. Make taps to ductile iron piping only with service saddle, tapping boss of a fitting or valve body, or equipment casting.

C. Install piping with sufficient slopes for venting or drainage of liquids and condensate to low points.

D. Support piping as specified in Section 400529 - Hangers and Supports for Process Piping and Equipment.

E. Provide expansion joints as specified in Section 400513 - Common Work Results for Process Piping and pipe guides as specified in Section 400529 - Hangers and Supports for Process Piping and Equipment to compensate for pipe expansion due to temperature differences.

F. Field Cuts: According to pipe manufacturer's recommendations.

G. Finish primed surfaces according to Section 099000 - Painting and Coating.

3.04 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

SECTION 400519 – DUCTILE IRON PROCESS PIPE

3.05 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Inspect for damage to pipe lining or coating, or other defects that may be detrimental as determined by the Engineer. Repair damaged piping, or provide new undamaged pipe.
- C. Testing and Disinfection:
 - 1. Perform a visual inspection of the Raw Water Pump discharge piping and the screen spray water piping at normal operating pressure. Correct all visible leaks.
 - 2. Refer to Section 331301- Piping Testing and disinfection.
- D. After installation, inspect for proper supports and interferences.

3.06 CLEANING

- A. Section 017000 - Execution and Closeout Requirements specifies requirements for cleaning.
- B. Keep pipe interior clean as installation progresses.
- C. Clean pipe interior of soil, grit, loose mortar, and other debris after pipe installation.

END OF SECTION

SECTION 400519 – DUCTILE IRON PROCESS PIPE

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SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Valves.
2. Valve actuators.

B. Related Requirements:

1. Section 033000 - Cast-in-Place Concrete: Execution requirements for placement of concrete as required by this Section.
2. Section 331301 - Piping Testing and Disinfection.
3. Section 055000 - Metal Fabrications: Miscellaneous metalwork and fasteners specified by this Section.
4. Section 099000 - Painting and Coating: Product and execution requirements for painting specified by this Section.
5. Section 400557 - Actuators for Process Valves and Gates.
6. Section 400559.33 - Cast Iron Slide Gates.
7. Section 400564 - Butterfly Valves.
8. Section 400565.26 - Tilting Disk Check Valves,

1.02 REFERENCE STANDARDS

A. American Water Works Association:

1. AWWA C542 - Electric Motor Actuators for Valves and Slide Gates.
2. AWWA C550 - Protective Interior Coatings for Valves and Hydrants.

B. ASTM International:

1. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.
2. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

C. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP-25 - Standard Marking System for Valves, Fittings, Flanges and Unions.

D. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

- E. National Fire Protection Association:
 - 1. NFPA 70 - National Electrical Code (NEC).
- F. NSF International:
 - 1. NSF 61 - Drinking Water System Components - Health Effects.
 - 2. NSF 372 - Drinking Water System Components - Lead Content.
- G. UL:
 - 1. Equipment Directory.

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with piping, equipment, and appurtenances.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data:
 - 1. Submit manufacturer data for actuator with model number and size indicated.
 - 2. Submit valve cavitation limits.
- C. Shop Drawings:
 - 1. Provide assembly drawings indicating parts list, materials, sizes, position indicators, limit switches, control system, actuator mounting, wiring diagrams, and control system schematics.
- D. Valve-Labeling Schedule: Indicate valve locations and nametag text.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Certification of Valves Larger than 12 inches: Furnish certified copies of hydrostatic factory tests, indicating compliance with applicable standards.
- G. Manufacturer Instructions: Submit installation instructions and special requirements.
- H. Source Quality-Control Submittals: Indicate results of factory tests and inspections.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

- B. Project Record Documents: Record actual locations of valves and actuators.

1.06 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.
- B. Spare Parts:
 - 1. Furnish one set of manufacturer's recommended spare parts.

1.07 QUALITY ASSURANCE

- A. Maintain clearances as indicated on Drawings.
- B. Ensure that materials of construction of wetted parts are compatible with process liquid.

1.08 QUALIFICATIONS

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

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Protect valve ends from entry of foreign materials by providing temporary covers and plugs.
 - 3. Provide additional protection according to manufacturer instructions.

1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

1.11 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.

PART 2 - PRODUCTS

2.01 VALVES

- A. Description: Valves, operator, actuator, handwheel, chainwheel, extension stem, floor stand, worm and gear operator, torque tube operators, operating nut, chain, wrench, and other accessories as required.
- B. Valve Ends: Compatible with adjacent piping system.
- C. Operation:
 - 1. Open by turning counterclockwise; close by turning clockwise.
 - 2. Cast directional arrow on valve or actuator with OPEN and CLOSE cast on valve in appropriate location.
- D. Valve Marking and Labeling:
 - 1. Marking: Comply with MSS SP-25.
 - 2. Labeling: As specified in pipe schedule.
- E. Valve Construction:
 - 1. Bodies: Rated for maximum temperature and pressure to which valve will be subjected as specified in valve Sections.
 - 2. Bonnets:
 - a. Flanged to body and of same material and pressure rating as body.
 - b. Furnish glands, packing nuts, or yokes as specified in valve Sections.
 - 3. Stems and Stem Guides:
 - a. Materials and Seals: As specified in valve Sections.
 - b. Bronze Valve Stems: According to ASTM B62.
 - c. Space stem guides 10 feet o.c.
 - d. Submerged Stem Guides: Type 304 stainless steel.
 - 4. All bolts, nuts and studs shall, unless otherwise approved, shall conform to ASTM A307, Grade B; or ASTM A354. All bolts, nuts and studs on or required to connect submerged or buried valves shall be fluorocarbon coated.
 - 5. Bolts and nuts shall be hexagon heads and nuts.

2.02 VALVE ACTUATORS

- A. Provide actuators with position indicators.

SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

- B. Comply with AWWA C541 and C542.
- C. Provide chain actuators and means to operate hand/auto lever for shutoff valves mounted 5½ feet above operating floor level.
- D. Provide gear and power actuators with position indicators.
- E. Gear-Assisted Manual Actuators:
 - 1. Provide totally enclosed gears.
 - 2. Maximum Operating Force: 60 lbf.
 - 3. Bearings: Permanently lubricated bronze.
 - 4. Packing: Accessible for adjustment without requiring removal of actuator from valve.
- F. Chain Actuator:
 - 1. Description: Chain guides and hot-dip-galvanized operating chain extending to 5-1/2 feet above operating floor level.
 - 2. Chain Wheels: Sprocket-rim type.
 - 3. Furnish chain storage if chains may interfere with pedestrian traffic.
- G. Valve Actuators in NEC Class I, Group D, Division 1 or 2 Hazardous Locations: UL approved.
- H. Electric Motor Actuators:
 - 1. As specified in Section 260503 - Equipment Wiring Connections and following:
 - a. 208 V three phase as indicated on Drawings.
 - 2. Motors: As specified in Section 400593 - Common Motor Requirements for Process Equipment.
 - 3. Control Panel:
 - a. Factory mounted.
 - b. NEMA 250, Type 4.
 - c. Single-point power connection and grounding lug.
 - 4. Controls: Actuator mounted local/remote and open/close/stop control. Remote open/close control from PLC discrete signals/relays. Opened and closed feedback to PLC via dry contacts limit switches. MODBUS RTU Communications.
 - 5. Disconnect Switch: field mounted.
 - 6. Gearing:
 - a. Single- or double-reduction unit.
 - b. Spur or helical gears and worm gearing.
 - c. Lubrication: oil in sealed housing.
 - 7. Internal anticondensation heater.

SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

- I. Accessories:
 1. Handwheel:
 - a. Furnish permanently attached handwheel for emergency manual operation.
 - b. Rotation: None during powered operation.
 - c. Permanently affix directional arrow and cast OPEN on handwheel to indicate appropriate direction to turn handwheel.
 - d. Maximum Operating Force: 60 lbf.
 2. Provide torque tube operators where shown on Drawings.

2.03 VALVE BOXES

- A. Valves installed in the ground shall be equipped with an adjustable screw type valve box, minimum 1 foot adjustment.
- B. The valve box shall have a barrel with a base to fit the valve on which it is to be installed.
- C. Valve boxes for gate valves shall be three piece screw type, 5 ¼" shaft with No. 6 base and a valve box cover.
- D. Valve boxes shall be high quality cast-iron castings suitable for HS-20 loading.
- E. All valve box parts must be compatible and interchangeable with Buffalo Pipe and Foundry Corp. valve boxes.
- F. Valve box covers shall fit property in the barrel without movement.
- G. Manufacturer:
 1. Bibby-LaPerle, (Figure V619 #CC),
 2. Hays,
 3. Tyler - a division of McWane, Inc.
 4. Sigma.

2.04 FINISHES

- A. Valve Lining and Coating: Comply with AWWA C550.
- B. Exposed Valves: As specified in Section 099000 - Painting and Coating.
- C. Do not coat flange faces of valves unless otherwise specified.

2.05 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.

SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

- B. Shop Tests: Submit for approval the following:
1. Hydrostatic tests for each valve when required by the valve specifications included herein.
 2. Each gate valve shall have the leakage test required by Section 5 of AWWA C509 performed with the pressure differential applied in both directions.
 3. The manufacturer of butterfly valves shall submit certified copies of reports covering the bi-directional leakage tests in accordance with Section 6, AWWA C504.
 4. The manufacturer of ball valves shall submit certified copies of reports covering the tests in accordance with Section 5, AWWA C507.
- C. Certificates:
1. Where specified or otherwise required by Engineer, submit test certificates.
 2. The Contractor shall submit certificates of compliance with the applicable referenced standards.
 3. Submit certificate of compliance with NSF/ANSI Standard 61 for all products under this section, including interior coatings, by an independent, authorized laboratory.
- D. Delivery Tickets:
1. Furnish delivery tickets indicating the valve manufacturer, valve type and class, identifying that the valves are new and from a manufacturer that has been submitted and approved.
- E. Testing Criteria:
1. Contractor must provide manufacturer's test specifications for all tapping sleeve and valves prior to field testing.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 013000 - Administrative Requirements: Requirements for installation examination.
- B. Verify that piping system is ready for valve installation.

3.02 INSTALLATION

- A. Install valves, actuators, extensions, valve boxes, and accessories according to manufacturer instructions.
- B. Firmly support valves to avoid undue stresses on piping.
- C. Coat studs, bolts, and nuts with anti-seizing lubricant.

SECTION 400551 - COMMON WORK RESULTS FOR PROCESS VALVES

- D. Clean field welds of slag and splatter to provide a smooth surface.
- E. Install valves with stems upright or horizontal, not inverted.
- F. Install valves with clearance for installation of insulation and allowing access.
- G. Provide access where valves and fittings are not accessible.
- H. Comply with Section 400507 - Hangers and Supports for Process Piping for pipe hangers and supports.
- I. Comply with Division 40 - Process Integration for piping materials applying to various system types.
- J. Install insulation as indicated on Drawings and pipe schedule.
- K. Valve Applications:
 - 1. Install valves at locations as indicated on Drawings and as specified in this Section.
 - 2. Install shutoff and isolation valves.
 - 3. Isolate equipment, part of systems, or vertical risers as indicated on Drawings.
 - 4. Install valves for throttling, bypass, or manual flow control services as indicated on Drawings.

3.03 FIELD QUALITY CONTROL

- A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- B. Valve Field Testing:
 - 1. Test for proper alignment.
 - 2. If specified by valve Section, field test equipment to demonstrate operation without undue noise, vibration, or overheating.
 - 3. Engineer will witness field testing.

END OF SECTION

SECTION 400553 - IDENTIFICATION FOR PROCESS PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Nameplates.
2. Tags.
3. Stencils.
4. Pipe markers.
5. Ceiling tacks.
6. Labels.

B. Related Requirements:

1. Section 099000 - Painting and Coating: Execution requirements for painting specified by this Section.
2. Section 400551 - Common Work Results for Process Valves: Basic materials and methods or valves.

1.02 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.03 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer's catalog literature for each product required.

C. Shop Drawings: Submit list of wording, symbols, letter size, and color-coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

1.04 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for closeout procedures.

1.05 QUALITY ASSURANCE

A. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

SECTION 400553 - IDENTIFICATION FOR PROCESS PIPING

- B. Conform to 10 States Standards for color scheme for identification of potable water piping systems.

1.06 QUALIFICATIONS

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

PART 2 - PRODUCTS

2.01 STENCILS

- A. Manufacturer List:
 - 1. Kolbi Pipe Marker Co.
 - 2. Marking Services, Inc.
 - 3. Pipemarket.com; Brimar Industries, Inc.
 - 4. R & R Identification Co.
 - 5. Seton Identification Products
 - 6. Substitutions: Specified in Section 016000 - Product Requirements.
- B. Description:
 - 1. Clean-cut symbols.
 - 2. Letters:
 - a. Up to 2-inch Outside Diameter of Insulation or Pipe: 1/2-inch-high letters.
 - b. 2-1/2- to 6-inch Outside Diameter of Insulation or Pipe: 1-inch-high letters.
 - c. Over 6-inch Outside Diameter of Insulation or Pipe: 1-3/4-inch-high letters.
- C. Stencil Paint: As specified in Section 099000 - Painting and Coating; semigloss enamel.
- D. Color-Coding and Lettering Size: Conform to ASME A13.1.

2.02 PIPE MARKERS

- A. Color-Coding and Lettering Size: Conform to ASME A13.1.
- B. Plastic Pipe Markers:
 - 1. Manufacturer List:
 - 2. Brady ID.
 - 3. Craftmarker Pipe Markers.
 - 4. Marking Services, Inc.
 - 5. R & R Identification Co.

SECTION 400553 - IDENTIFICATION FOR PROCESS PIPING

6. Seton Identification Products.
7. Description:
 - a. Factory-fabricated, flexible, semi-rigid plastic.
 - b. Preformed to fit around pipe or pipe covering.
 - c. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers:
 1. Manufacturer List:
 2. Brady ID.
 3. Craftmarker Pipe Markers.
 4. Kolbi Pipe Marker Co.
 5. Marking Services, Inc.
 6. Pipemarket.com; Brimar Industries, Inc.
 7. Seton Identification Products.
 8. Substitutions: Specified in Section 016000 - Product Requirements.
- D. Description: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

2.03 LABELS

- A. Manufacturer List:
 1. Seton Identification Products.
 2. Substitutions: Specified in Section 016000 - Product Requirements.
- B. Description:
 1. Laminated Mylar construction.
 2. Minimum Size: 1.9 by 0.75 inches.
 3. Adhesive backed, with printed identification.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Degrease and clean surfaces to receive adhesive for identification materials.
- C. Prepare surfaces as specified in Section 099000 - Painting and Coating for stencil painting.

SECTION 400553 - IDENTIFICATION FOR PROCESS PIPING

3.02 INSTALLATION

- A. Apply stencil painting as specified in Section 099000 - Painting and Coating.
- B. Install identifying devices after completion of coverings and painting.
- C. Install plastic nameplates with corrosion-resistant mechanical fasteners or adhesive.
- D. Labels:
 - 1. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer.
 - 2. For unfinished covering, apply paint primer before applying labels.
- E. Piping:
 - 1. Identify piping, concealed or exposed, with plastic pipe markers, plastic tape pipe markers, or stenciled painting.
 - 2. Use tags on piping 3/4-inch diameter and smaller.
 - 3. Identify service, flow direction, and pressure.
 - 4. Install in clear view and align with axis of piping.
 - 5. Locate identification not to exceed 20 feet on straight runs, including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.

END OF SECTION

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Electric motor operators for butterfly valves.

B. Related Requirements:

1. Section 055000 - Metal Fabrications: Miscellaneous metalwork and fasteners as required by this Section.
2. Section 099000 - Painting and Coating: Product and execution requirements for painting specified by this Section.
3. Section 260503 - Equipment Wiring Connections: Motor connections for electric actuators.
4. Section 400564 - Butterfly Valves
5. Section 400593 - Common Motor Requirements for Process Equipment: Motors for electric actuators.

1.02 REFERENCE STANDARDS

A. American Bearing Manufacturers Association:

1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
2. ABMA 11 - Load Ratings and Fatigue Life for Roller Bearings.

B. American Water Works Association:

1. AWWA C542 - Electric Motor Actuators for valves and slide gates.

C. NFPA:

1. NFPA 70 - National Electrical Code.

1.03 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with installation of valves and accessories.

1.04 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

- B. Product Data: Submit manufacturer information for actuator with model number and size indicated.
- C. Shop Drawings: Submittals shall include but not be limited to the following:
 - 1. Manufacturer's literature, illustrations, specifications, detailed drawings, data, and descriptive literature on all actuators and appurtenances including dimensions, materials, size, and weight.
 - 2. Documentation showing the required normal and maximum operating torque of each valve versus the torque ratings of the actuator selected for use on that valve.
 - 3. List of all actuators indicating tag number, part numbers and type (on/off, modulating).
 - 4. Submit certificates of compliance with referenced standards.
 - 5. Detailed description of all testing configurations and proposed test procedures.
 - 6. Where specified or otherwise required by the Engineer, submit test certificates.
 - 7. Manufacturer's Instructions: Indicate application conditions and limitations of use. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
 - 8. Operation and Maintenance Data: Include bound copies of operating and programming instructions, adjustments, and preventative maintenance procedures and materials. Provide operating and maintenance instructions, including parts lists for all of the equipment.
- D. Calculations or data used for sizing of the actuators.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Manufacturer Instructions: Submit special procedures and placement requirements.
- G. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- H. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- I. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and installer.
 - 2. Submit manufacturer's approval of installer.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations and types of actuators.
- C. Manufacturer's Warranty:
 - 1. All warranties shall individually start at the time of final completion and acceptance in writing by the Owner or his representative.

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

2. Provide the manufacturer's standard written warranty on all materials and workmanship for a minimum of 2 years.
3. Provide a minimum 5-year manufacturer's written warranty against breakage of any mechanical drive components, leakage of the housing seals and failure of the control or communication circuit components.
4. Fill out original warranty forms in the Owner's name and register with manufacturer.

1.06 QUALITY ASSURANCE

- A. All actuators and appurtenances provided shall be from a single manufacturer. The actuators shall be standard units currently in factory production by the manufacturer.
- B. The quality of all materials, manufacturing processes, and the finished actuators shall be subject to the inspection and approval of the Engineer.

1.07 QUALIFICATIONS

- A. Product: Proposed product shall have been a standard offering of the manufacturer for at least the last 5 years. The Contractor shall provide three references presently using the product for at least the last 5 years.
- B. Manufacturer: Each actuator purchased for the entirety of the Work shall be the product of a single manufacturer. The manufacturer shall have a minimum of 10 years experience manufacturing electric actuators and a minimum of 5 years of experience producing the actuator model to be quoted.
- C. Installer: The installer shall have a minimum of 5 years of experience installing actuators and appurtenances, and shall show evidence of at least 5 installations (similar to the Work required for this Project) in satisfactory operation.
- D. Testing:
 1. Actuators are to be assembled to their valve, setup and tested and shipped as an assembly by the valve manufacturer according to the manufacturer's instructions.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Delivery of Materials: No materials shall be shipped without the written consent of the Engineer upon review of all submittal and testing information. The Contractor is responsible to inspect all materials received for size, quality, and quantity against the approved Shop Drawings.
- C. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

- D. Handling of Materials: The Contractor shall carefully handle all products. Any component that is dropped, dented, or damaged by the Contractor or as a result of delivery or storage shall not be incorporated into the final assembly. The Contractor at his expense shall replace the component.
- E. Storage of Materials: All materials shall be stored in the original package of the manufacturer whenever possible. The products shall be labeled. They shall be stored in a covered, dry location until installation according to the manufacturer's instructions.
- F. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Furnish temporary end caps and closures on piping and fittings and maintain in place until installation.
 - 3. Provide additional protection according to manufacturer instructions.

1.09 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish two-year manufacturer's warranty for actuators.

PART 2 - PRODUCTS

2.01 DESCRIPTION

- A. Furnish electric motor actuators system for butterfly valves.
- B. Electric actuators shall include the electrical enclosure, electric motor, reduction gearing, valve stem drive nut/bushing, travel limiting devices, torque overload measurement device, control circuitry, gear case, and automatic declutchable handwheel.

2.02 ELECTRIC MOTOR OPERATORS

- A. Manufacturers
 - 1. Rotork Model IQ3
 - 2. AUMA Model SAR
 - 3. EIM Model TEC 2000
 - 4. Substitutions: Not permitted.

2.03 OPERATING ENVIRONMENT:

- A. Continuously operating (24 hours per day, 7 days per week) municipal water facilities.
- B. Non-hazardous industrial environment (damp, humid, dust, and dirt).

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

- C. Indoor temperature range of 0 degrees C (32 degrees F) to 40 degrees C (104 degrees F) and relative humidity 0 percent to 95 percent.
- D. Electrical classification is General Purpose.

2.04 MECHANICAL

- A. The Contractor shall determine the correct actuator locations and sizes required for the process conditions as indicated by the Contract Drawings and Specifications.
- B. The actuator enclosure shall meet or exceed IP-67 specifications (watertight, corrosion resistant, and temporarily submersible).
- C. All cover screws and fasteners as well as mounting hardware shall be stainless steel.
- D. The actuator shall be suitable for operation at any angle.
- E. Speed reduction shall be achieved utilizing spur, helical, bevel, and/or worm type gears. All gearing material shall be either steel or bronze. Aluminum and/or non-metallic gear material shall not be utilized.
- F. All gears and shafts shall be fully supported on anti-friction bearings. Where susceptible to thrust loads, roller type or axial thrust type bearings shall be utilized.
- G. Gears and shafts shall be lubricated. Mechanical seals shall be provided and shall contain the lubricant regardless of shaft position. Lubricants shall be suitable for the Site conditions indicated in this section.
- H. Each actuator shall include a handwheel or crank for manual operation of the valve if motor power is unavailable. The handwheel or crank shall require no more than 80 ft. lbs. of rim pull to operate. Operation of the motor shall not transmit motion to the handwheel and operation of the handwheel shall not cause the motor to rotate. When the handwheel is in use, no motor torque shall be capable of being transmitted to the handwheel. The actuator body shall include an indication of required direction of handwheel rotation to open and to close the valve.
- I. The lever or handle used to disengage the clutch shall be capable of being padlocked in either the manual or motor mode.
- J. Valve position shall be locally indicated on the actuator.
- K. All multi turn valve actuators shall include field adjustable mechanical stop limiting devices, one at full open and one at full closed, to prevent over travel and one 4-20 mA position transmitter.

2.05 ELECTRICAL

- A. Actuators shall operate from plus or minus 10 percent of the 208 VAC, 3-phase 60 Hz service power. Distribution wiring is designed for a maximum voltage loss of 5 percent.

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

- B. The AC motor shall be specifically designed for use in actuators and shall be suitable for operation from the voltage indicated.
- C. The motor shall be totally enclosed and non-ventilated. Insulation shall be Class F. The actuator shall be provided with thermostatic and overload relay protection integral to the actuator.
- D. The Contractor shall select and size the actuators for open/close and positioning service as required for the specific application. The minimum output torque or thrust of the actuator shall exceed the torque or thrust requirements of the valve by a minimum of 20 percent at all locations throughout the valve travel.
- E. Two field adjustable position limit switches shall be included and shall be capable of indicating valve fully closed, valve fully open, or any positions in between. The installed setup shall have one switch set at the valve fully opened position and the other at valve fully closed. One 4-20 mA position transmitter shall monitor valve position from 0-100% open.
- F. Field adjustable torque limit protection shall be included and shall be capable of interrupting the control circuit when the predetermined torque is exceeded at the fully open position, the fully closed position, or if the torque is exceeded during travel in either direction due to an obstruction.
- G. Actuator shall be provided with protection against phase reversal of the supply power.
- H. The actuator electrical enclosure shall meet or exceed IP-67 standard, be integral to the actuator and shall house the electrical controls, field connection power and control terminal strips, and a thermostatically controlled space heater to prevent condensation.
- I. Terminal strips shall accept bare wire as well as wires terminated with crimp on lugs.
- J. For open/close service, both the motor and starter shall be rated for at least sixty (60) starts per hour. For modulating service, both the motor and starter shall be rated for at least twelve hundred (1200) starts per hour.
- K. Provide control power transformer with primary and secondary protection.
- L. Reversing starter with solid state type contacts for open/close service and only solid state type contacts for modulating service.
- M. Actuators must be fully electrically repairable in the field, at least to the board level, using standard hand tools and not require return to the factory for repair.

2.06 CONTROLS

- A. Each actuator shall be equipped with microprocessor based digital control electronics to provide for remote monitoring. All control software and configuration data shall be stored in non-volatile type memory. Batteries shall not be required to maintain memory back-up or program storage.

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

- B. As a minimum, each actuator shall provide the following data to the master control system.
 - 1. Valve in full open position.
 - 2. Valve in full closed position.
 - 3. Selector switch in the Local position.
 - 4. Selector switch in the Remote position.
 - 5. Selector switch in the Off position.
- C. When in remote mode control signals must be accepted from the SCADA over a hardwired signal.
- D. Integral lockable three-position selector switch for Local - Off - Remote control.
- E. Integral open-close pushbutton(s) or selector switch.
- F. Adjustable Open/Close stroke time: 60 seconds.
- G. With the exception of limit and torque switch settings during setup, configuration of the actuator shall not require any removal of wires, covers, etc.
- H. Provide remote station control as indicated on the drawings.

2.07 SPARE PARTS

- A. Furnish manufacturers recommended spare parts kits to accommodate one (1) butterfly valve actuator.

2.08 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that field dimensions are as indicated on Shop Drawings.

3.02 PREPARATION:

- A. Verify that systems are ready to receive work.

SECTION 400557 - ACTUATORS FOR PROCESS VALVES AND GATES

- B. During installation of all actuators the Contractor shall verify that all items are clean and free of defects in material and workmanship and function properly.

3.03 INSTALLATION:

- A. Install all actuators and appurtenances in accordance with the manufacturer's instructions.
- B. Install all actuators so that operating handwheel, local push buttons and controls may be conveniently accessed from operating floor without interference, and as approved by the Engineer.
- C. Unless noted otherwise, install all actuators plumb and level. Actuator(s) shall be installed free from distortion; strain or raking caused by misaligned piping, equipment, or supports.

3.04 SERVICES OF THE MANUFACTURER:

- A. The Contractor shall provide on-Site startup and commissioning services of a factory trained service person to inspect the installation prior to placing any unit in service, to supervise the initial operation, and to instruct the owner in the proper operation, care, and maintenance of the equipment.

3.05 FIELD TESTS AND ADJUSTMENTS:

- A. Factory Authorized Service Personnel shall conduct tests of each valve/actuator assembly, in both manual and automatic modes, in the presence of the Engineer to demonstrate that each unit and all associated components function properly under all possible field conditions.
- B. The Contractor shall furnish any required test equipment and/or commissioning consumables.
- C. The Contractor shall adjust all parts and components as required to provide correct operation.

3.06 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. After installation, inspect for proper supports and interferences.
- D. Repair damaged coatings with material equal to original coating as specified in Section 099000 - Painting and Coating.

END OF SECTION

SECTION 400559.33 - CAST IRON SLIDE GATES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Cast-iron slide gates.
- B. Related Requirements:
 - 1. Section 099000 - Painting and Coating: Coating requirements as required in this Section.
 - 2. Section 400523 - Common Work Results for Process Valves:

1.02 DEFINITIONS

- A. Operating Head: Distance from centerline of gate to maximum water level of channel.

1.03 REFERENCE STANDARDS

- A. American Water Works Association:
 - 1. AWWA C560 - Cast Iron Slide Gates.
- B. National Sanitation Foundation:
 - 1. NSF Standard 61 - Drinking Water System Components - Health Effects.
 - 2. NSF Standard 372 - Drinking Water System Components - Lead Content.

1.04 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with Work of other Sections.

1.05 PREINSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.06 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer's product information for system materials and component equipment.

SECTION 400559.33 - CAST IRON SLIDE GATES

- C. Shop Drawings:
 - 1. Indicate system materials and component equipment.
 - 2. Submit installation and anchoring requirements, fasteners, and other details.
 - 3. Indicate gate identification number, location, service, type, size, design pressure, operator details, stem details, and loads.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 1. Certify that installation is completed according to manufacturer's instructions.
- E. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations and assumptions for seating and unseating pressure.
- F. Manufacturer's Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- G. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- H. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- I. Manufacturer Reports:
 - 1. Certify that equipment has been installed according to manufacturer's instructions.
 - 2. Indicate activities on Site, adverse findings, and recommendations.
- J. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and licensed professional.

1.07 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for closeout procedures.
- B. Project Record Documents: Record actual locations of installed slide gates and components.

1.08 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

1.09 QUALITY ASSURANCE

- A. Materials in Contact with Potable Water: Certified to NSF Standard 61 and NSF Standard 372.
- B. Perform Work according to local standards.
- C. Maintain one copy of each standard affecting the Work of this Section on Site.

SECTION 400559.33 - CAST IRON SLIDE GATES

1.10 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of New York.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site and inspect for damage.
- C. Store materials according to manufacturer's instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from areas involved in construction operations.
 - 2. Provide additional protection according to manufacturer's instructions.

1.12 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.13 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish two-year manufacturer's warranty for slide gates.

PART 2 - PRODUCTS

2.01 PERFORMANCE AND DESIGN CRITERIA

- A. Seating and Unseating Pressure:
 - 1. 25 feet of water.
 - 2. Measurement: From maximum water surface to centerline of gate.
- B. Minimum Vertical Loading: 50 percent of force on the gate from operating head acting on horizontal centerline of gate, multiplied by effective gate area, plus weight of slide and stem.

SECTION 400559.33 - CAST IRON SLIDE GATES

- C. Gate Reinforcement: As required for deflection not greater than 1/720 of span.
- D. Operating Head:
 - 1. Safety Factor: Design gate to operate under specified operating head with safety factory of five.

2.02 CAST-IRON SLIDE GATES

A. Manufacturers:

- 1. Henry Pratt Co. / Hydro Gate.
- 2. Waterman Industries.
- 3. Rodney Hunt.
- 4. Substitutions: Not permitted.

B. Description:

- 1. Comply with AWWA C561.
- 2. Sluice Gate Nos. 1 through 4: Non-self-contained cast-iron slide gate, with limited frame, lifting stem, lift and lift support, stem, stem guide, and stem block.
- 3. Sluice Gate No. 5: Self-contained cast-iron slide gate, with extended frame, yoke, lifting stem attached to yoke, lift and lift support, stem, stem guide, and stem block.
- 4. Size: 48-inches by 48-inches.
- 5. Operating Head: 25 feet.
- 6. Closure: Bottom flush.
- 7. Opening: Upward.

C. Gates:

- 1. Configuration:
 - a. One piece.
 - b. Removable.
- 2. Material: Cast iron.
- 3. Minimum Thickness: 3/4 inch.
- 4. Ribs:
 - a. As required based on operating head.
 - b. Molded into gate; bolted or bonded ribs are not acceptable.
 - c. Provide reinforcing rib around gate perimeter.

D. Yokes:

- 1. Material: Cast iron.
- 2. Mounting: Bolted to gate frame.

E. Seats:

- 1. Impacted into dovetail slots and held in position without use of screws or other fasteners.
- 2. Maximum Clearance between Seating Faces: 0.004 inch when gate is fully closed.

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F. Wedges:

1. Description: Machined brass blocks with angled faces and secured with a stud bolt to prevent slippage during operation.
2. Provide side, top, and bottom wedges.

G. Wall Thimbles (existing):

1. Material: Cast iron.
2. Type: Flanged
3. Size: 48-inch by 48-inch square.

H. Frames:

1. Configuration: One piece.
2. Material: Cast iron.
3. Slide Clearance: Not greater than 1/8 inch.
4. Guide Slot Length: Minimum 50 percent of slide length when in full open position.
5. Mounting: Existing wall thimble.
6. Bottom Flush Closure: Resilient seal securely attached to frame along invert.

I. Lifting Devices:

1. Description: Stem, lifting nut, supports, bushings, stem cover, position indicator, and gear-assisted handwheel.
2. Provision for using a power drive operator.
3. Mounting: Cast-iron pedestal.

J. Handwheel:

1. Material: Cast aluminum.
2. Diameter: 16 inches.
3. Configuration: Removable.
4. Fully lubricated.
5. Mounting: Locate center of handwheel 36 inches above operating floor.

K. Lifting Nut:

1. Material: Brass.
2. Furnish grease fitting.
3. Furnish polymer bearing pads above and below lifting nut.

L. Lifting Stem:

1. Material: Type 304 stainless steel.
2. Configuration:
 - a. Rising.
 - b. Removable.
3. Thread:
 - a. Acme, double lead.
 - b. Cut threads are not acceptable.

SECTION 400559.33 - CAST IRON SLIDE GATES

4. Diameter: 2-inch.
5. Maximum Number of Turns: 16 per foot of travel.
6. Stem Covers: Provide rising stem gates with clear polycarbonate covers, capped, vented, and of a length to allow full travel of gate.

2.03 FINISHES

- A. As specified in Section 099000 - Painting and Coating.
- B. Stainless Steel Surfaces: Mill finish.

2.04 ACCESSORIES

- A. Hardware: Type 304 stainless steel.

2.05 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Provide shop inspection and testing of completed assemblies.
- C. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that facilities are ready to receive slide gates.

3.02 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Clean surfaces according to manufacturer's instructions.

3.03 INSTALLATION

- A. Install slide gates according to manufacturer's instructions.

SECTION 400559.33 - CAST IRON SLIDE GATES

- B. Ensure that products are installed plumb, true, and free of warp or twist.
- C. Locate operators to avoid interference with handrails and other Work.
- D. Internally brace wall thimbles during concrete placement to prevent warping.
- E. Guides:
 - 1. Surface- and Flange-Mounted:
 - a. Install guides with expansion anchors.
 - b. Position guides at elevation as indicated on Drawings.
 - 2. Recessed:
 - a. Cut slot in concrete to receive guides.
 - b. Position guides at elevation as indicated on Drawings.
 - c. Grout guides in place according to manufacturer's instructions.
- F. Sealant:
 - 1. Rubber gasket of uniform thickness or mastic, to form seal between front face of thimble and back of gate frame.
- G. Lubrication:
 - 1. Furnish oil and grease as required for initial operation.
 - 2. Lubricate stem threads prior to initial operation.
- H. Painting and Coating: As specified in Section 099000 - Painting and Coating.
- I. Installation Standards: Install Work according to local standards.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspection:
 - 1. Verify alignment of gate and components.
 - 2. Verify that gate operates smoothly and does not bind or scrape.
- D. Testing:
 - 1. Comply with AWWA C560.
 - 2. Leakage: Not exceeding 0.1 gpm/ft. of seating perimeter under 20 feet of seating head and not exceeding 0.21 gpm/ft. under 20 feet of unseating head.

SECTION 400559.33 - CAST IRON SLIDE GATES

- E. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than one day on Site for each sluice gate for installation, inspection, field testing, and instructing Owner's personnel in maintenance of equipment.
- F. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and re-inspect.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.
- G. Furnish installation certificate from equipment manufacturer's representative attesting equipment has been properly installed and is ready for startup and testing.

3.05 ADJUSTING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.
- B. Adjust slide gates to provide smooth operation.

3.06 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate equipment operation, routine maintenance, and emergency repair procedures to Owner's personnel.

3.07 ATTACHMENTS

- A. Slide Gate Schedule:
 - 1. Sluice Gate Nos 1 through 4:
 - a. Raw Water Pump Station Screen Channels.
 - b. Material: Cast iron.
 - c. Size: 48-inch by 48-inch.
 - d. Stem Configuration: Nonrising.
 - e. Closure: Bottom Flush.
 - f. Opening: Upward.
 - g. Operator: Floorstand with Handwheel.
 - 2. Sluice Gate No. 5:
 - a. Raw Water Pump Station Wet Well
 - b. Material: Cast iron.
 - c. Size: 48-inch by 48-inch.
 - d. Stem Configuration: Nonrising.
 - e. Closure: Bottom Flush.

SECTION 400559.33 - CAST IRON SLIDE GATES

- f. Opening: Upward.
- g. Operator: 2-inch nut in existing floor box.

END OF SECTION

SECTION 400559.33 - CAST IRON SLIDE GATES

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SECTION 400564 - BUTTERFLY VALVES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Rubber-seated butterfly valves.

B. Related Requirements:

1. Section 099000 – Painting and Coating.
2. Section 220523 - General-Duty Valves for Plumbing Piping: Miscellaneous plumbing valves as required by Project.
3. Section 400551 - Common Work Results for Process Valves: Basic materials and methods related to valves commonly used for process systems.
4. Section 400507 – Hangers and Supports for Process Piping.
5. Section 400557 – Actuators for Process Valves and Gates.

1.02 REFERENCE STANDARDS

A. American Society of Mechanical Engineers:

1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings.
2. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through 24 - Metric/Inch Standard.
3. ASME B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300.

B. ASTM International:

1. ASTM A536 - Standard Specification for Ductile Iron Castings.
2. ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
3. ASTM D3222 - Standard Specification for Unmodified Poly (Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
4. ASTM D4101 - Standard Specification for Polypropylene Injection and Extrusion Materials.

C. American Water Works Association:

1. AWWA C504 - Rubber-Seated Butterfly Valves, 3 In. (75 mm) Through 72 In. (1,800 mm).

1.03 SUBMITTALS

- ##### A. Section 013300 - Submittal Procedures: Requirements for submittals.

SECTION 400564 - BUTTERFLY VALVES

B. Product Data:

1. Submit catalog information, indicating materials of construction and compliance with indicated standards.

C. Source Quality-Control Submittals: Indicate results of shop tests and inspections.

PART 2 - PRODUCTS

2.01 RUBBER-SEATED BUTTERFLY VALVES

A. Manufacturers:

1. Henry Pratt Co. Triton XR70.
2. GA Industries Series 800.
3. DeZurik Model BAW.
4. Substitutions: Not permitted.

B. Description:

1. AWWA C504, Class 150.
2. Maximum Fluid Temperature: 200 degrees F as indicated on valve schedule.
3. Style: Flanged.
4. Shaft: Self-lubricating, sleeve-type bearings.
5. Seats: Mounted on body; field replaceable.
6. Packing: Replaceable without dismantling valve.
7. End Connections: ASME B16.1.
8. Provide gear actuators conforming to AWWA C504 for manual valves.

C. Operator:

1. Handwheel or electric motor operated as per Section 3.02-Attachments.
2. Gear Actuators: Conforming to AWWA C504 for manual valves.

D. Materials:

1. Body: ASTM A126, cast iron or ASTM A536, ductile iron.
2. Stem: Stainless steel.
3. Disc: ASTM A536, ductile iron.
4. Seats: Resilient, replaceable, EPDM rubber or Buna-N.
5. Seating Surfaces: Type 316 stainless steel.
6. Bearings: sleeve.
7. Connecting Hardware: Type 316 stainless steel.

E. Finishes: As specified in Section 400523 - Common Work Results for Process Valves.

2.02 SOURCE QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.

SECTION 400564 - BUTTERFLY VALVES

- B. Testing: Test butterfly valves according to AWWA C504.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that field dimensions are as indicated on Shop Drawings.
- C. Inspect existing flanges for nonstandard bolt-hole configurations or design, and verify that new valve and flange mate properly.

3.02 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Thoroughly clean valves before installation.

3.03 INSTALLATION

- A. According to AWWA C504 and manufacturer instructions.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspection:
 - 1. Inspect for damage to valve lining or coating and for other defects that may be detrimental as determined by Architect/Engineer.
 - 2. Repair damaged valve or provide new, undamaged valve.
 - 3. After installation, inspect for proper supports and interferences.

3.05 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Keep valve interior clean as installation progresses.
- C. After installation, clean valve interior of soil, grit, loose mortar, and other debris.

SECTION 400564 - BUTTERFLY VALVES

3.06 EQUIPMENT PERFORMANCE TESTS

- A. Refer to Section 019100 – Commissioning for field performance testing requirements.

3.07 ATTACHMENTS

- A. Butterfly Valve Schedule:
 - 1. Raw Water Pump discharge
 - a. Size: 30-inch
 - b. Number: 5
 - c. Actuator: Manual handwheel
 - 2. Raw Water Screen Spray Water
 - a. Size: 4-inch
 - b. Number: 2
 - c. Actuator: Electric Motor Operator

END OF SECTION

SECTION 400565.26 - TILTING DISC CHECK VALVES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Tilting disc check valves, 2 through 60 inches in size.
- B. Related Requirements:
 - 1. Section 099000 - Painting and Coating.
 - 2. Section 220523 - General-Duty Valves for Plumbing Piping: Miscellaneous plumbing valves as required by Project.
 - 3. Section 400551 - Common Requirements for Process Valves: Basic materials and methods related to valves commonly used for process systems.

1.02 REFERENCE STANDARDS

- A. American Water Works Association:
 - 1. AWWA C508 - Swing-Check Valves for Waterworks Service, 2-In. Through 24-In. (50-mm Through 600-mm) NPS.
- B. ASME International:
 - 1. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
 - 2. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard.
- C. ASTM International:
 - 1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
 - 2. ASTM A536 - Standard Specification for Ductile Iron Castings.
 - 3. ASTM B271/B271M - Standard Specification for Copper-Base Alloy Centrifugal Castings.
 - 4. ASTM B505/B505M - Standard Specification for Copper Alloy Continuous Castings.
- D. NSF International:
 - 1. NSF 61 - Drinking Water System Components - Health Effects.
 - 2. NSF 372 - Drinking Water System Components - Lead Content.
- E. SSPC - The Society for Protective Coatings:
 - 1. SSPC-SP 6 - Commercial Blast Cleaning.

SECTION 400565.26 - TILTING DISC CHECK VALVES

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with piping and equipment connections specified in other Sections and as indicated on Drawings.

1.04 PREINSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.05 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit catalog information, indicating materials of construction and compliance with indicated standards.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- E. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.06 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents:
 - 1. Record actual locations of piping, valves and other appurtenances, connections, and centerline elevations.

1.07 QUALITY ASSURANCE

- A. Materials in Contact with Potable Water: Certified according to NSF 61 and NSF 372.
- B. Perform Work according to local standards.
- C. Maintain one copy of each standard affecting Work of this Section on Site.

SECTION 400565.26 - TILTING DISC CHECK VALVES

1.08 QUALIFICATIONS

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

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Protect piping and appurtenances by storing off ground.
 - 3. Provide additional protection according to manufacturer instructions.

1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.01 TILTING DISC CHECK VALVES

- A. Manufacturers:
 - 1. Henry Pratt Co.
 - 2. GA Industries Figure 7125
 - 3. DeZurik/APCO
 - 4. Substitutions: Not permitted.
- B. Description:
 - 1. Type: Tilting disc check valves with off-center pivot.
 - 2. Size: 30 inches.
 - 3. Valves Larger Than 6 Inches: Capable of accepting a field-installed oil dashpot.
 - 4. Minimum Working Pressure: 150 psig.
 - 5. Maximum Fluid Temperature: 200 degrees F.

SECTION 400565.26 - TILTING DISC CHECK VALVES

C. Body:

1. Material: Cast iron, ASTM A126 or Ductile iron ASTM A536.
2. Style: Two piece.
3. End Connections:
 - a. Flanged.
 - b. Comply with ASME B16.1.
 - c. Class: 150.

D. Seats:

1. Material: Bronze or stainless steel.
2. Tilting Angle: 55 degrees.

E. Disc:

1. Material: Ductile iron, ASTM A536.
2. Pivot Pin and Bushing: Type 304 stainless steel.

F. Finishes: As specified in Section 400551 - Common Requirements for Process Valves.

G. Accessories:

1. Disc position indicator.
2. Closed position limit switch.
3. Connecting Hardware: Type 304 stainless steel.

2.02 SOURCE QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.

B. Testing:

1. Hydrostatically test check valves at twice rated pressure according to AWWA C508.
2. Permitted Leakage at Indicated Working Pressure: None.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that field dimensions are as indicated on Shop Drawings.
- C. Inspect existing flanges for nonstandard bolt-hole configurations or design, and verify that new valve and flange mate properly.

SECTION 400565.26 - TILTING DISC CHECK VALVES

3.02 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Thoroughly clean valves before installation.

3.03 INSTALLATION

- A. According to AWWA C508 and manufacturer instructions.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspection:
 - 1. Inspect for damage to valve lining or coating and for other defects that may be detrimental as determined by Architect/Engineer.
 - 2. Repair damaged valve or provide new, undamaged valve.
 - 3. After installation, inspect for proper supports and interferences.

3.05 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Keep valve interior clean as installation progresses.
- C. After installation, clean valve interior of soil, grit, loose mortar, and other debris.

3.06 EQUIPMENT PERFORMANCE TESTS

- A. Refer to Section 019100 – Commissioning for field performance testing requirements.

3.07 ATTACHMENTS

- A. Check Valve Schedule:
 - 1. Raw Water Pump discharge
 - a. Size: 30-inch
 - b. Number: 5

END OF SECTION

SECTION 400565.26 - TILTING DISC CHECK VALVES

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SECTION 400567.36 - PRESSURE-REGULATING VALVES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Pressure-reducing valves.

B. Related Requirements:

1. Section 099000 – Painting and Coating.
2. Section 400507 - Hangers and Supports for Process Piping: Anchors and supports.
3. Section 400523 – Common Work Results for Process Valves.

1.02 REFERENCE STANDARDS

A. ASME International:

1. ASME B1.20.1 - Pipe Threads, General Purpose (Inch).
2. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard.
3. ASME B16.24 - Cast Copper Alloy Pipe Flanges and Flanged Fittings: Classes 150, 300, 600, 900, 1500, and 2500.
4. ASME B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300.

B. ASTM International:

1. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
2. ASTM A216/A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service.
3. ASTM A536 - Standard Specification for Ductile Iron Castings.
4. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.

C. American Water Works Association:

1. AWWA C530 – Pilot – Operated Control Valves.
2. AWWA C550 - Protective Interior Coatings for Valves and Hydrants.

D. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

SECTION 400567.36 - PRESSURE-REGULATING VALVES

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate with installation of process piping.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer catalog information.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit special procedures and setting dimensions.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of pressure-regulating valves.

1.06 QUALITY ASSURANCE

- A. Materials in Contact with Potable Water: Certified to NSF Standards 61 and 372.
- B. Perform Work according to AWWA standards.
- C. Maintain one copy of each standard affecting Work of this Section on Site.

1.07 QUALIFICATIONS

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

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

SECTION 400567.36 - PRESSURE-REGULATING VALVES

- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Furnish temporary end caps and closures on piping and fittings and maintain in place until installation.
 - 3. Provide additional protection according to manufacturer instructions.

1.09 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.10 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Cavitation Damage: Warrant that valves will not suffer cavitation damage within a five-year period from date of installation when exposed to specified operating conditions.

PART 2 - PRODUCTS

2.01 PRESSURE-REDUCING VALVES

- A. Manufacturers:
 - 1. Ross Valve Co. Model 40WR
 - 2. GA Industries Figure 4500
 - 3. Substitutions: Not permitted.
- B. Description:
 - 1. Normally open valves to maintain constant downstream pressure regardless of changing flow rate or varying inlet pressure.
 - 2. Type: Pilot operated.
 - 3. Furnish V-ports for pressure control at low flows.
 - 4. Indicator Rod: Attached to piston for visual position indication.

SECTION 400567.36 - PRESSURE-REGULATING VALVES

- C. Pilot Valves:
 - 1. Type: Globe.
 - 2. Body: Bronze.
- D. End Connections:
 - 1. Flanged, ASME B16.5, Class 150.
- E. Materials:
 - 1. Body: Cast iron, ASTM A126, Class B.
 - 2. Disc and Diaphragm:
 - a. Leather or Buna-N rubber.
 - b. Disc Retainer and Diaphragm Washer: Bronze.
 - 3. Trim (seat ring): Stainless steel.
 - 4. Stem, Nut, and Spring: Stainless steel.
 - 5. Packing: PTFE.
 - 6. Control Piping: Brass with stainless-steel wetted trim.
- F. Interior Coating: Coat cast-iron and ductile-iron surfaces with epoxy coating according to AWWA C550.
- G. Accessories:
 - 1. Externally mounted strainer with cocks.

2.02 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Provide shop inspection and testing of completed assembly.
- C. Owner Inspection:
 - 1. Make completed pressure-regulating valve available for inspection at manufacturer's factory prior to packaging for shipment.
 - 2. Notify Owner at least seven days before inspection is allowed.
- D. Owner Witnessing:
 - 1. Allow witnessing of factory inspections and test at manufacturer's test facility.
 - 2. Notify Owner at least seven days before inspections and tests are scheduled.

SECTION 400567.36 - PRESSURE-REGULATING VALVES

- E. Certificate of Compliance:
 - 1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
 - 2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that field dimensions are as indicated on Shop Drawings.
- C. Inspect existing flanges for nonstandard bolt hole configurations or design and verify that new pipe and flanges mate properly.

3.02 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Thoroughly clean end connections before installation.
- C. Close pipe and equipment openings with caps or plugs during installation.
- D. Cleaning: Clean surfaces to remove foreign substances.

3.03 INSTALLATION

- A. According to manufacturer instructions and local code requirements.
- B. Install with nameplate and test cock accessible.

3.04 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. After installation, inspect for interferences and proper supports.

SECTION 400567.36 - PRESSURE-REGULATING VALVES

- D. Testing:
 - 1. Hydrostatic: Test each assembled valve, except control piping, hydrostatically at 1-1/2 times rated working pressure for minimum five minutes.
 - 2. Leakage:
 - a. Test each valve for leakage at rated working pressure against closed valve.
 - b. Test Duration: Minimum 15 minutes.
 - c. Permitted Leakage: Zero.
 - 3. Perform functional test on each valve to verify specified performance.
- E. Repair damaged coatings with material equal to original coating.

3.05 CLEANING

- A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.
- B. Keep interior of valves clean as installation progresses.

3.06 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

3.07 ATTACHMENTS

- A. Pressure reducing valve schedule.
 - 1. Raw Water Screen spray water.
 - 2. Number: 2.
 - 3. Size: 4-inch.
 - 4. Connections: Flanged.
 - 5. Flow Rate: 250 to 300 gpm.
 - 6. Upstream Pressure: 100 to 150 psi.
 - 7. Required Downstream Pressure: 80 to 100 psi.

END OF SECTION

SECTION 400593 - COMMON MOTOR REQUIREMENTS PROCESS EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Single- and three-phase motors for application on equipment provided under other Sections.
- B. Related Requirements:
 - 1. Section 260553 - Identification for Electrical Systems.

1.02 REFERENCE STANDARDS

- A. American Bearing Manufacturers Association:
 - 1. ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
- B. National Electrical Manufacturers Association:
 - 1. NEMA MG 1 - Motors and Generators.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.03 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit catalog data for each motor furnished loose. Indicate nameplate data, standard compliance, electrical ratings and characteristics, physical dimensions, weights, mechanical performance data, and support points.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Test and Evaluation Reports: Indicate procedures and results for specified factory and field testing and inspection.
- E. Qualifications Statements:
 - 1. Submit qualifications for manufacturer and testing agency.

SECTION 400593 - COMMON MOTOR REQUIREMENTS PROCESS EQUIPMENT

1.04 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.
- B. Testing Agency: Company specializing in testing products specified in this Section with minimum three years' experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Lift only with lugs provided. Handle carefully to avoid damage to components, enclosure, and finish.
- C. Protect products from weather and moisture by covering with plastic or canvas and by maintaining heating within enclosure.
- D. For extended outdoor storage, remove motors from equipment and store separately.

PART 2 - PRODUCTS

2.01 PRODUCT REQUIREMENTS FOR MOTORS FURNISHED WITH EQUIPMENT

- A. Motors 3/4 hp and Larger: Three-phase motor as specified below.
- B. Motors Smaller than 3/4 hp: Single-phase motor as specified below, except motors less than 250 watts or 1/4 hp may be equipment manufacturer's standard.
- C. Three-Phase Motors: NEMA MG 1, Design B, energy-efficient squirrel-cage induction motor with windings to accomplish starting methods and number of speeds, as indicated on Drawings.
 - 1. Voltage:
 - a. As indicated on Drawings.
 - 2. Service Factor: min. 1.15 or as indicated on Drawings.
 - 3. Enclosure: Meet conditions of installation unless specific enclosure is indicated on Drawings.
 - 4. Design for continuous operation in 40-degree C environment, with temperature rise according to NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
 - 5. Insulation System: NEMA Class F.
 - 6. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.
 - 7. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy-encapsulated solid state-control relay with wiring to terminal box.

SECTION 400593 - COMMON MOTOR REQUIREMENTS PROCESS EQUIPMENT

8. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum ABMA 9, L-10 life of 200,000 hours. Calculate bearing load with NEMA minimum, V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
 9. Sound Power Levels: Conform to NEMA MG 1.
- D. Single-Phase Motors:
1. Permanent split-capacitor type where available; otherwise use split-phase start/capacitor run or capacitor start/capacitor run motor.
 2. Voltage: 115 115/230 or 230 volts, single phase, 60 Hz.
- E. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated.

2.02 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Testing: Test motors according to NEMA MG 1, including winding resistance, no-load speed and current, locked rotor current, insulation high-potential test, and mechanical alignment tests.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.
- B. Disconnect and remove abandoned motors.
- C. Clean and repair existing motors to remain or those to be reinstalled.

3.02 INSTALLATION

- A. Maintain access to existing motors and other installations remaining active and requiring access. Modify installation or provide access panel.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Install engraved plastic nameplates according to Section 260553 - Identification for Electrical Systems.
- D. Ground and bond motors.

SECTION 400593 - COMMON MOTOR REQUIREMENTS PROCESS EQUIPMENT

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Inspect and test according to NETA ATS, except Section 4.
- D. Perform inspections and tests listed in NETA ATS, Section 7.15.

END OF SECTION

SECTION 407213 - ULTRASONIC LEVEL METERS (CONTINUOUS AND POINT TYPE)

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Ultrasonic-level measurement devices.
 - 2. Transmitters.
- B. Related Requirements:
 - 1. Section 260503 - Equipment Wiring Connections: Control power wiring requirements.

1.02 REFERENCE STANDARDS

- A. National Electrical Manufacturers Association:
 - 1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with travelling water screen work.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information for system materials and component equipment, including connection requirements.
- C. Shop Drawings:
 - 1. Indicate system materials and component equipment.
 - 2. Submit installation requirements and other details.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Source Quality-Control Submittals: Indicate results of factory tests and inspections.
- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Manufacturer Reports: Certify that equipment has been installed according to manufacturer instructions.

SECTION 407213 - ULTRASONIC LEVEL METERS (CONTINUOUS AND POINT TYPE)

H. Qualifications Statement:

1. Submit qualifications for manufacturer.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for closeout procedures.
- B. Project Record Documents: Record actual locations and final orientation of equipment and accessories.

1.06 QUALITY ASSURANCE

- A. Ensure that materials of construction of wetted parts are compatible with process liquid.

1.07 QUALIFICATIONS

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

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 2. Provide additional protection according to manufacturer instructions.

1.09 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish two-year manufacturer's warranty for ultrasonic-level measurement devices.

SECTION 407213 - ULTRASONIC LEVEL METERS (CONTINUOUS AND POINT TYPE)

PART 2 - PRODUCTS

2.01 ULTRASONIC-LEVEL MEASUREMENT DEVICES

A. Manufacturers:

1. Siemens Hydro Ranger 200.
2. Substitutions: or approved equal.

B. Description:

1. Measuring Range: Up to 25 feet.
2. Operating Temperature Range: -4 to 149 degrees F.
3. Beam Angle: 6 degrees.

C. Operation: Menu guided.

D. Transmitters:

1. Dual Point Level Monitoring selected by sensor manufacturer to match sensor.
2. Visual Display: Four digit.
3. Output Signal: 4- to 20-mA dc and relay for differential setpoint.
4. Location: As indicated on Drawings.
5. Control Power:
 - a. Wiring: As specified in Section 260503 - Equipment Wiring Connections.
 - b. 120-V ac, single phase, 60 Hz.
6. Enclosures: NEMA 250 Type 4X.
7. Mounting:
 - a. Integral with sensor.
 - b. Control panel.
8. Furnish cable, field preamplifiers, and signal conditioners as required to maintain accuracy from sensor to terminal device.

2.02 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Provide shop inspection and testing of completed assembly.

SECTION 407213 - ULTRASONIC LEVEL METERS (CONTINUOUS AND POINT TYPE)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

3.02 INSTALLATION

- A. Coordinate location and orientation of level probe assemblies with final equipment installations.
- B. Ensure that instruments are located to be easily accessible for maintenance.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than 4 hours on Site for installation, inspection, field testing, and instructing Owner's personnel in maintenance of equipment.
- D. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.

3.04 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION

SECTION 407313 - PRESSURE GAUGES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Pressure gages.
- B. Related Requirements:
 - 1. Section 220523 – General Duty Valves for Plumbing Piping.
 - 2. Section 407363 – Diaphragm Seals.
 - 3. Section 400507 – Hangers and Supports for Process Piping.

1.02 REFERENCE STANDARDS

- A. ASME International:
 - 1. ASME B40.100 - Pressure Gauges and Gauge Attachments.
- B. NSF International:
 - 1. NSF 61 - Drinking Water System Components - Health Effects.
 - 2. NSF 372 - Drinking Water System Components - Lead Content.

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with piping work.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information for system materials and component equipment, including connection requirements.
- C. Shop Drawings:
 - 1. Indicate system materials and component equipment.
 - 2. Submit installation requirements and other details.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Source Quality-Control Submittals: Indicate results of shop tests and inspections.

SECTION 407313 - PRESSURE GAUGES

- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of equipment and accessories.

1.06 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.
- B. Extra Stock Materials:
 - 1. Furnish two spare gauges.

1.07 QUALITY ASSURANCE

- A. Ensure that materials of construction of wetted parts are compatible with process liquid.
- B. Materials in Contact with Potable Water: Certified to NSF 61 and NSF 372.
- C. Perform Work according to local standards.
- D. Maintain copy of each standard affecting Work of this Section on Site.

1.08 QUALIFICATIONS

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

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.

SECTION 407313 - PRESSURE GAUGES

D. Protection:

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

1.10 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish two-year manufacturer's warranty for pressure gages.

PART 2 - PRODUCTS

2.01 PRESSURE GAGES

A. Manufacturers:

1. Ashcroft Model 1279
2. Ametek (US Guage) Model 1980
3. Omega Engineering, Inc.
4. Substitutions: Not Permitted.

B. Type: Analog.

C. Dials:

1. Nominal Diameter: 4-1/2 inches.
2. Face: White, laminated plastic dials with black graduations.
3. Scale: Extend over arc not less than 270 degrees.
4. Ranges and Graduation Units: As indicated on pressure gage schedule.

D. Cases:

1. Liquid filled.
2. Material: Phenolic.
3. Type: Blowout protected.
4. Blowout Disc Encasement Material: Steel.
5. Provide removable rear plate.
6. Windows:
 - a. Material: Clear, shatterproof glass.
 - b. Thickness: 1/8 inch.
 - c. Provide gasket.

E. Connection:

1. Location: Bottom.

SECTION 407313 - PRESSURE GAUGES

2. Socket:
 - a. 1/4-inch NPT male thread.
 - b. Material: Brass forging.
 - c. Extend minimum 1-1/4 inches below gage cases.
 - d. Provide wrench flats.
 3. Mounting: Provide flexible, stainless steel armored line assembly.
- F. Measuring Element:
1. Bourdon Tubes:
 - a. Material: Phosphor bronze to brass socket.
 - b. Provide welded, stress-relieved joints.
 2. Movement:
 - a. Rotary geared.
 - b. Material: Stainless steel.
 3. Accuracy:
 - a. Comply with ASME B40.100.
 - b. Plus and minus 0.5 percent of full-scale range.
- G. Adjustment:
1. Provide for zero-reading adjustment.
 2. Adjusting Screws: Accessible from rear of case without need for disassembly.
- H. Accessories:
1. Pressure Snubber:
 - a. Material: Type 316 stainless steel.
 - b. Provide isolation valve.
 2. Shutoff Cocks: Furnished by gage manufacturer.

2.02 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Provide shop inspection and testing of completed assembly.

SECTION 407313 - PRESSURE GAUGES

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

3.02 INSTALLATION

- A. According to manufacturer instructions.
- B. Coordinate location and orientation of gages and seal assemblies with final piping and equipment installations.
- C. Ensure that gages are located to be easily read during operation and easily accessible for maintenance.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.

3.04 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

SECTION 407313 - PRESSURE GAUGES

3.05 ATTACHMENTS

- A. Pressure Gage Schedule:
1. Raw Water Pump Station discharge header.
 2. Number: 2.
 3. Diaphragm seal: yes.
 4. Process fluid: raw water.
 5. Range: 0-50 psi.

END OF SECTION

SECTION 407336 - PRESSURE SWITCHES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Pressure switches.

B. Related Requirements:

1. Section 260503 - Equipment Wiring Connections: Control power wiring requirements.
2. Section 407363 - Diaphragm Seal.
3. Section 460553 - Identification for Water and Wastewater Equipment: Nameplates or tags for equipment specified in this Section.

1.02 REFERENCE STANDARDS

A. National Electrical Manufacturers Association:

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA ICS 1 - Industrial Control and Systems: General Requirements.

B. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

1.03 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with piping Work.

1.04 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information for system materials and component equipment, including connection requirements.

C. Shop Drawings:

1. Indicate system materials and component equipment.
2. Submit installation requirements and other details.

SECTION 407336 - PRESSURE SWITCHES

- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- F. Qualifications Statement:
 - 1. Submit qualifications for manufacturer.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of equipment and accessories.

1.06 QUALITY ASSURANCE

- A. Ensure that materials of construction of wetted parts are compatible with process liquid.
- B. Materials in Contact with Potable Water: Comply with NSF 61 and NSF 372.
- C. Perform Work according to local standards.
- D. Maintain one copy of each standard affecting Work of this Section on Site.

1.07 QUALIFICATIONS

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

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

SECTION 407336 - PRESSURE SWITCHES

1.09 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish two-year manufacturer's warranty for pressure and differential pressure switches.

PART 2 - PRODUCTS

2.01 PRESSURE SWITCHES

- A. Manufacturers:
 - 1. Ashcroft Model B4.
 - 2. Dwyer.
 - 3. Omega.
 - 4. Substitutions: Not permitted.
- B. Type: Diaphragm actuated.
- C. Materials:
 - 1. Diaphragm: Buna-N.
 - 2. Housing: Epoxy coated aluminum.
- D. Accuracy: Plus or minus 1 percent of operating range.
- E. Dead Band: Adjustable to 60 percent of full scale.
- F. Set Points: Adjustable between 20 and 80 percent of adjustable range.
- G. Connection:
 - 1. Location: Bottom.
 - 2. Size: 1/4 inch.
 - 3. Furnish taps for sensing lines.
 - 4. Provide flexible, stainless steel armored line assembly.
- H. Electrical:
 - 1. Contacts:
 - a. One.
 - b. SPDT.
 - c. Type: Snap action, according to NEMA ICS 1.
 - 2. Ampacity: 5 A at 120-V ac.
- I. Enclosures: NEMA 250 Type 4.

SECTION 407336 - PRESSURE SWITCHES

J. Operation:

1. Control Power Wiring: As specified in Section 260503 - Equipment Wiring Connections.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

3.02 INSTALLATION

- A. According to manufacturer instructions.
- B. Ensure that instruments are located to be easily accessible for maintenance.
- C. Installation Standards: Install Work according to local standards.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than 4 hours on Site for installation, inspection, startup, field testing, and instructing Owner's personnel in operation and maintenance of equipment.
- D. Equipment Acceptance:
 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 2. Make final adjustments to equipment under direction of manufacturer's representative.
- E. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

3.04 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.

SECTION 407336 - PRESSURE SWITCHES

- B. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

3.05 ATTACHMENTS

- A. Pressure Switch Schedule:
 - 1. Raw Water Screens Spray Water:
 - 2. Number: 2
 - 3. Process fluid: potable water
 - 4. Pressure rating: 200 psi
 - 5. Pressure setting: 80 to 100 psi

END OF SECTION

SECTION 407336 - PRESSURE SWITCHES

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SECTION 407363 - DIAPHRAGM SEALS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Diaphragm seals.
- B. Related Requirements:
 - 1. Section 407313 - Pressure and Differential Pressure Gauges.
 - 2. Section 407336 - Pressure and Differential Pressure Switches.
 - 3. Section 430520 - Common Work Results for Liquid Handling Equipment: Pressure measurement and control requirements as specified in this Section.

1.02 REFERENCE STANDARDS

- A. NSF International:
 - 1. NSF 61 - Drinking Water System Components - Health Effects.
 - 2. NSF 372 - Drinking Water System Components - Lead Content.

1.03 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with piping Work.

1.04 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information for system materials and component equipment, including connection requirements.
- C. Shop Drawings:
 - 1. Indicate system materials and component equipment.
 - 2. Submit installation requirements and other details.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Source Quality-Control Submittals: Indicate results of shop tests and inspections.
- F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- G. Qualifications Statement:

SECTION 407363 - DIAPHRAGM SEALS

1. Submit qualifications for manufacturer.

1.05 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of equipment and accessories.

1.06 QUALITY ASSURANCE

- A. Ensure that materials of construction of wetted parts are compatible with process liquid.
- B. Materials in Contact with Potable Water: Certified to NSF 61 and NSF 372.
- C. Perform Work according to local standards.
- D. Maintain one copy of each standard affecting Work of this Section on Site.

1.07 QUALIFICATIONS

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

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store materials according to manufacturer instructions.
- D. Protection:
 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 2. Provide additional protection according to manufacturer instructions.

1.09 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish two-year manufacturer's warranty for diaphragm seals.

SECTION 407363 - DIAPHRAGM SEALS

PART 2 - PRODUCTS

2.01 DIAPHRAGM SEALS

A. Manufacturers:

1. Ashcroft Model 100.
2. Omega 100 Series.
3. Ametek Type S.
4. Substitutions: Not permitted.

B. Description:

1. Mounting:
 - a. Directly to pressure gage socket.
 - b. Provide flexible, stainless-steel-armored line assembly.
2. Wetted Parts and Bolt Materials: Corrosion resistant to process fluid.
3. Provide fill/bleed screw for filling of diaphragm seal.
4. Instrument Connection: NPT, 1/4 inch.
5. Process Connection: NPT, 1/2 inch.
6. Flushing Connection: NPT, 1/4 inch.
7. Working Pressure Rating: Pipeline working pressure 200 psi.
8. Calibration: Provide cleanout ring to be removed for recalibration or cleaning, without loss of filling liquid or change in calibration.

2.02 SOURCE QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.

B. Diaphragm Seals:

1. Factory-assemble, fill, and calibrate entire assembly, including gage, prior to shipment.
2. Field filling is not acceptable.

C. Provide shop inspection and testing of completed assembly.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that items provided by other Sections of Work are ready to receive Work of this Section.

SECTION 407363 - DIAPHRAGM SEALS

3.02 INSTALLATION

- A. According to manufacturer instructions.
- B. Mount only one pressure element per diaphragm seal.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.

3.04 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Demonstrate equipment startup, shutdown, routine maintenance, and emergency repair procedures to Owner's personnel.

END OF SECTION

DIVISION 46

WATER AND WASTEWATER EQUIPMENT

SECTION 462160 - TRAVELING WATER SCREENS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Traveling water screens.
- B. Related Requirements:
 - 1. Section 055000 - Metal Fabrications: Fasteners, brackets, and other miscellaneous metal fabrications.
 - 2. Section 066000 - Fiberglass Reinforced Polymer (FRP) Products and Fabrications.
 - 3. Section 099000 - Painting and Coating.
 - 4. Section 260503 - Equipment Wiring Connections: Wiring connections.
 - 5. Section 400564 - Butterfly Valves.
 - 6. Section 400567.36 - Pressure Regulating Valves.
 - 7. Section 400593 - Common Motor Requirements for Process Equipment: Electric motors and accessories normally supplied as part of equipment assemblies.
 - 8. Section 407213 - Ultrasonic Level Meters.
 - 9. Section 407336 - Pressure Switches.

1.02 DEFINITIONS

- A. Traveling Water Screen: A device consisting of a continuous series of vertical baskets fitted with mesh screens on endless strands of roller chain which screens, removes, and collects debris from an incoming gravity-flow channel.

1.03 REFERENCE STANDARDS

- A. The equipment shall be designed, manufactured, installed, and tested in accordance with federal and state requirements and applicable sections of the latest editions of the following codes and standards:
 - 1. ABMA American Bearing Manufacturers Association
 - 2. AGMA American Gear Manufacturers Association
 - 3. AISC American Institute of Steel Construction
 - 4. AISI American Iron and Steel Institute
 - 5. ANSI American National Standards Institute
 - 6. ASME American Society of Mechanical Engineers
 - 7. ASTM American Society for Testing and Materials
 - 8. AWS American Welding Society
 - 9. AWWA American Water Works Association
 - 10. IEEE Institute of Electrical and Electronics Engineers
 - 11. NEC National Electrical Code
 - 12. NEMA National Electrical Manufacturers' Association
 - 13. OSHA Occupational Safety and Health Act
 - 14. SSPC Steel Structures Painting Council (SSPC)
 - 15. UL Underwriters Laboratories

SECTION 462160 - TRAVELING WATER SCREENS

1.04 PREINSTALLATION MEETINGS

- A. Section 013000 - Administrative Requirements: Requirements for preinstallation meeting.
- B. Convene minimum one week prior to commencing Work of this Section.

1.05 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data: Submit manufacturer information describing materials of construction, fabrication, and protective coatings.
- C. Shop Drawings:
 - 1. Detailed dimensional and general assembly drawings including plans, elevations, sections, and details.
 - 2. Product data for each component including materials of construction and weight.
 - 3. Detailed wiring diagrams, fabrication drawings, and P&ID for power, control, and instrumentation.
 - 4. PLC Programming and ModBus TCP/IP Mapping.
 - 5. Water pressure and flow requirements for the spray water system.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
- F. Source Quality-Control Submittals: Indicate results of factory tests and inspections.
- G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- H. Manufacturer Reports: Certify that equipment has been installed according to manufacturer instructions.
- I. Qualifications Statements:
 - 1. Submit qualifications for manufacturer.
 - 2. Submit qualifications of manufacturer's installation personnel.

1.06 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual locations of equipment.

1.07 QUALITY ASSURANCE

- A. Perform Work according to local standards.

SECTION 462160 - TRAVELING WATER SCREENS

- B. Maintain one copy of each standard affecting Work of this Section on Site.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum twenty-five years' documented experience.
- B. Installer: By Manufacturer using personnel specializing in performing Work of this Section with minimum five years' documented experience.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Store equipment according to manufacturer instructions.
- D. Protection:
 - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
 - 2. Provide additional protection according to manufacturer instructions.

1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.11 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish two-year manufacturer's warranty for traveling water screens.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Provide new traveling water screens as manufactured by:
 - 1. Evoqua Water Technologies, LLC
 - 2. Screening Systems International, Inc.
 - 3. Ovivo Inc./Brackett Green
 - 4. Substitutions: Not permitted

SECTION 462160 - TRAVELING WATER SCREENS

2.02 GENERAL

- A. Traveling water screens shall be designed to remove grass, weeds, twigs, leaves, algae, marine life, and similar debris typically encountered in fresh water.
- B. Traveling water screens shall be designed for continuous and intermittent operation.
- C. All components shall be amply proportioned for all stresses that may occur during manufacturing, transportation, erection, and operation.
- D. Traveling water screens shall consist of a series of overlapping, screen baskets mounted on two (2) parallel strands of carrier chain. The carrier chains shall be suspended between the head and foot section assemblies of the main framework.
- E. Traveling water screens shall be equipped with woven wire mesh baskets and a spray water system. Screen baskets shall carry debris above the main operating floor, where it shall be removed on the ascending side by a high pressure spray which discharges to a screenings trough and debris collection basket.
- F. One screen shall be left hand drive and one shall be right hand drive.
- G. All hardware shall be series 300 stainless steel or corrosion resistant.

2.03 PERFORMANCE AND DESIGN CRITERIA

- A. Traveling water screens shall be designed in accordance with the following performance and configuration requirements:

Location	Sturgeon Point Raw Water Pump Station
Quantity	Two (2)
Designation	Raw Water Screen Nos. 1 and 2
Design flow rate, each	77 MGD @ low water level
Type	Vertical flow-through
Channel width	8'-6"
Basket width	7'-4"
Main operating floor elevation	601'
Screen Curb Elevation	602'
Screen Channel bottom elevation	552'
Screen upstream water elevation	
High	574'
Average	571'
Low	566'
Minimum Screen Efficiency	49%
Nominal screen speed	10 fpm
Available Spray water pressure	120 to 140 psi
Spray Water Connection	4" Flanged
Screen Frame	4 post
Screen Wall Guides	Surface Mounted
Screen Foot	Roll-around Boot

SECTION 462160 - TRAVELING WATER SCREENS

2.04 MATERIALS AND CONSTRUCTION FOR NEW VERTICAL TRAVELING SCREEN

A. Screen Baskets

1. Screen basket frames shall be designed to withstand a five foot head differential without excessive elastic and/or any plastic deformation. Basket frames shall be fabricated of high strength composite fiberglass. Pitch shall be 24 inches.
2. Each basket shall be attached to the carrier chain by four stainless steel bolts passing through the chain sidebars. Basket end plates shall be part of the basket frames to prevent passage of solids through the chains or chain guides.
3. Baskets shall be fitted with screen mesh of woven 14-gauge, Type 304 stainless steel wire, with 3/8-inch square clear openings. Mesh shall be attached to the baskets using stainless steel fasteners.
4. The gap between adjacent baskets shall be 3/8-inch or less to prevent the passage of debris and marine life. Flexible neoprene seals shall be provided to seal the gap between adjacent baskets.
5. Baskets shall have provision necessary for the installation of future fine mesh screens.

B. Carrier Chain

1. Carrier chain shall be of rigid unit link construction, designed for intermittent immersion in fresh water, and shall be of non-lubricated design. Sidebars shall be Type 304 stainless steel, pitched to match the screen baskets. Pins, bushings, and rollers shall be 17-4 PH stainless steel. Bushings shall be machined from Nitronic 60 material. Rollers and bushings shall be a minimum of 4-inch and 1¼-inch diameter, respectively, to reduce drive and differential friction and extend chain life. Pins shall be a minimum of 1¼-inch diameter. Carrier chain shall incorporate two corrosion-resistant spacers press fitted into each side bar or a welded spacer bar to ensure proper tracking on the head sprocket and boot section terminal.

C. Drive Unit

1. Each screen shall be furnished with a balanced drive designed to take the full NEMA rated stalling torque of the motor without damage to any part of the drive or screen.
2. The drive shall be designed to operate the screen at the chain speed specified. All drive components shall be designed to operate the screen continuously under a calculated load resulting from a differential water level of at least 1.0 foot between the upstream and downstream sides of the screen, and to start the screen under a differential water level of 2.5 feet at the maximum upstream water level specified.
3. Top mounted drive shall consist of an electric motor connected to a helical gear reducer through a shear pin arrangement.
4. The drive unit speed reducer shall be helical gear type with anti-friction bearings and shall have a minimum AGMA service factor of 1.25. The speed reducer shall be Falk, Nord, or approved equal. Grease shall be food grade.
5. The drive from the slow speed reducer shall be connected to the screen head shaft shall be by means of a steel roller chain running in a bath of oil and mounted outside of the screen housing. Oil shall be food grade.

SECTION 462160 - TRAVELING WATER SCREENS

6. The chain and driven sprocket shall operate outside of the screen housing, protected with a chain guard of the open-back type, made of No. 16 gauge steel or 3/16-inch thick molded fiberglass.
7. The drive sprocket on the reducer output shall incorporate a shearing pin device and shall provide protection for testing, normal running and NEMA rated motor stalling torque.
8. The drive shall be selected to operate the screen under normal conditions and utilize the full pull-out torque of the motor to overcome temporary, short peak overloads which might otherwise stop the motor completely.
9. The motor shall be mounted on a bracket or adapter attached to the speed reducer to form a sturdy, self-contained unit.
10. Overload protection shall be via a shear pin sprocket.
11. The motor shall be totally enclosed fan cooled construction with Class B insulation and rated at not less than 1½ horsepower. It shall be suitable for operation with 208 volt, 3 phase, 60 Hz power. Maximum motor speed shall be 1750 rpm. Refer to Section 400593 - Common Motor Requirements for Process Equipment.
12. Each drive unit shall be furnished with a motion switch, PCS Model A3000 or approved equal.

D. Frame

1. The main framework shall be 4 post and shall consist of the boot section assembly located at the base of the screen and intermediate and upper frame sections.
2. The framework shall be of adequate cross section and construction to transmit the entire load of the screen, excluding the load of the splash housing and rear housing, to the bottom of the screen well.
3. The main framework shall be of substantial construction, well stiffened and cross braced for rigidity and fabricated from 3/8-inch minimum thickness carbon steel. Running clearances less than or equal to ¼-inch shall be provided to prevent binding of baskets in the runways.
4. The screen frame shall be constructed to permit the placement of stop rods across the top of the channel walls to hold the screen at intermediate positions above the operating floor. This shall enable the screen to be installed in the channel in sections and facilitate raising the screen for periodic inspection, overhaul and repair. The maximum length of any single section of the main framework shall not exceed 15 feet. The maximum weight of any single section shall not exceed 5000 pounds.
5. Heavy angle tracks shall be furnished for chain runways on the front (ascending side) of the screens and rear (descending side) of the screens. Such tracks shall terminate at the lower end with a hard iron casting or fabricated steel piece, which will act as a takeoff shoe to prevent weaving action of the chain.
6. The head section shall be fabricated from ASTM A36 carbon steel, and shall be equipped with lifting lugs to enable lifting the entire assembly from the channel.
7. Frame members below the main operating floor shall be ASTM A36 carbon steel, 3/8-inch minimum thickness, designed to withstand a five (5) foot differential head across the screen.
8. Frame and boot openings shall be 3/8-inch or less to prevent refuse or marine life from passing under or around the screen. The use of frame and boot seals is acceptable.

SECTION 462160 - TRAVELING WATER SCREENS

9. The screen frame shall be installed in new surface mounted wall guides to be fabricated of A-36 steel and hot dipped galvanized.

E. Head Shaft Assembly

1. The head shaft assembly shall be of the oversized solid shaft design. The oversized solid shaft design shall be journaled at each end to prevent lateral movement.
2. The head shaft shall rotate in grease lubricated, anti-friction roller bearings. Grease shall be food grade. The driven sprocket shall be keyed to the head shaft for ease of removal, and shall transmit the torque directly to the other sprockets through the head shaft.
3. The head sprockets shall have six teeth each and shall consist of a cast design or heavy, plate center disc design with welded tooth sections. The head sprockets shall be equipped with replaceable stainless steel tooth inserts or cast iron replaceable corner wear rims to reduce load and extend chain life. Tooth inserts shall be bolted to the tooth body and shall be capable of being replaced without cutting the chain or removing the head shaft assembly from the screen.
4. Chain tension shall be protected by a spring take-up assembly.
5. Each roller bearing and motor bearing shall be provided with an automatic lubricator, Memolub Model EPS or approved equal.

F. Boot Section

1. The boot section shall be of the roll-around style (no foot shaft). The carrier chain and tray assemblies rotate through the boot section in a replaceable track constructed of 304 stainless steel.

G. Spray Water System

1. The head section shall be equipped with a spray water system designed to effectively remove debris from the ascending baskets by directing overlapping water sprays across the entire width of the screen baskets.
2. Internal spray water piping shall be fabricated using red brass piping and bronze fittings or 316 stainless steel piping and fittings, equipped with corrosion-resistant, non-clogging, replaceable nozzles. Piping shall be 4" flanged.
3. External spray water piping for each screen shall be equipped with an electric motor operated butterfly valve, a manual isolation gate valve, a pressure reducing valve, and a pressure switch.
4. Spray system shall be designed to operate at 120 to 140 psi available pressure.
5. The screen manufacturer shall provide the pressure reducing valves, pressure switches, and electrically operated butterfly valves for the spray water system.

H. Screen Housing

1. Screens shall be equipped with a molded fiberglass (3/16" thick min.), splash-proof housing to enclose the head terminal machinery, internal spray water system, and collection troughs. All joints shall be gasketed watertight. All bolts and hardware shall be stainless steel.
2. The rear housing shall be two-piece construction. The upper section shall be bolted to the frame; the lower section shall be easily removable. The housing

SECTION 462160 - TRAVELING WATER SCREENS

shall contain watertight inspection openings for viewing the entire width of the screen baskets.

3. The front housing shall be bolted to the screen frame, and shall allow for removal of the screens without interfering with the existing screenings trough. Gasketed inspection doors shall be provided above the screenings trough, equipped with quick-opening, corrosion-resistant door hardware. Internal fabricated partition walls shall direct debris and spray water into the existing debris trough which is located in the operating floor on the ascending side of the screen, and shall extend the full width of the screen.

I. Anchor Bolts

1. Anchor bolts and leveling hardware shall be series 300 stainless steel, furnished by the CONTRACTOR.

J. Screenings Trough

1. Provide a trough which will collect screenings from both traveling water screens and discharge to the existing screenings chamber.
2. The trough shall be constructed of molded fiberglass (3/16-inch minimum thickness) with stiffeners as needed.
3. The trough shall be approximately 18-inches wide and 23-feet long. The trough bottom shall slope from approximately 3-inches deep to 8-inches deep at the screening chamber.

K. Controls

1. Each traveling water screen shall be provided with a control panel provided by the screen manufacturer including the following:
 - a. Enclosure, NEMA 4X, stainless steel, wall-mounted type.
 - b. UL 508A label for the assembled control panel
 - c. Main circuit breaker, 10KAIC, with external operating handle
 - d. Motor starter, reversing type, 1-speed, 3-phase, NEMA rated
 - e. Control Power Transformer
 - f. "Power On" pilot light
 - g. Emergency Stop pushbutton
 - h. "On-Jog-Off-Auto" selector switch
 - i. "Jog Forward" pushbutton
 - j. "Jog Reverse" pushbutton
 - k. "Running" pilot light
 - l. "Stopped" pilot light
 - m. "Spray Water On" pilot light
 - n. "General Alarm" pilot light
 - o. "Lubricator Running" pilot light
 - p. "Overload Tripped" pilot light
 - q. Ultrasonic level controller
 - r. Programmer for ultrasonic level controller
 - s. Modicon M221 Mano/Micro PLC, or approved equal
 - t. Repeat cycle timer to cycle screen on/off
 - u. Elapsed run time meter

SECTION 462160 - TRAVELING WATER SCREENS

- v. Lot of relays and timers, plug in type
 - w. Lot of terminal blocks
 - x. 24VDC Industrial Power Supply
2. Contractor shall coordinate all SCADA related functions with Owner including but not limited to:
- a. Provide MODBUS read/write set points including the following:
 - 1) General Alarm.
 - 2) Running/Stopped.
 - 3) On-Jog-Off-Auto Switch Position.
 - 4) Wet Well Level.
 - 5) Lake Level.
 - b. Provide full paid for screening system to be used by Owner's system integrator for SCADA HMI screen development.
 - c. Coordination with Owner's system integrator as needed.

2.05 PAINTING

- A. With the exception of those parts and components customarily furnished unpainted, all metal surfaces shall be shop prepared and coated with a rust inhibitive shop primer, followed by two coats (6-8 mils DFT per coat) of a NSF-listed epoxy coating approved for use in contact with potable water. Epoxy coating shall be Tnemec Pota-Pox or approved equal. Machined surfaces shall be protected against damage and corrosion by other means. Shop paint shall be fully compatible with the field paint specified.
- B. Shop and field painting shall be in accordance with the Section 099000 – Painting and Coating.

2.06 MANUFACTURER'S WARRANTY

- A. The traveling water screen manufacturer shall warrant the equipment against defects in materials and workmanship for a period of two years following Final Payment by the OWNER. The manufacturer shall replace parts which shall become defective through normal use and wear for the entire warranty period.
- B. The warranty shall not alleviate the CONTRACTOR'S obligations as specified in the General Conditions Section entitled "CONTRACTOR'S General Warranty and Guarantee".

2.07 SOURCE QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for testing, inspection, and analysis.
- B. Provide shop inspection and testing of completed assembly.

SECTION 462160 - TRAVELING WATER SCREENS

- C. Owner Inspection:
 - 1. Make completed equipment available for inspection at manufacturer's factory prior to packaging for shipment.
 - 2. Notify Owner at least fourteen days before inspection is allowed.
- D. Owner Witnessing:
 - 1. Allow witnessing of factory inspections and test at manufacturer's test facility.
 - 2. Notify Owner at least fourteen days before inspections and tests are scheduled.
- E. Certificate of Compliance:
 - 1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
 - 2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that designated areas, clearances, structural requirements, piping, utility connections, and electronic signals are ready to receive equipment.

3.02 INSTALLATION

- A. According to manufacturer instructions.
- B. Installation shall be performed by Manufacturer's personnel.
- C. Painting: As specified in Section 099000 - Painting and Coating.

3.03 FIELD QUALITY CONTROL

- A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.
- B. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.
- C. Test for proper alignment.
- D. Start up, inspect, and operate equipment in presence of Architect/Engineer.
- E. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than three days on Site for each screen for the installation, inspection, startup, field testing, and instructing Owner's personnel in operation and maintenance of equipment.

SECTION 462160 - TRAVELING WATER SCREENS

- F. Equipment Acceptance:
 - 1. Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.
 - 2. Make final adjustments to equipment under direction of manufacturer's representative.
- G. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

3.04 DEMONSTRATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for demonstration and training.
- B. Section 019100 – Commissioning; Performance Tests.

3.05 MANUFACTURER'S FIELD SERVICE

- A. Provide the services of a qualified manufacturer's representative to be present at and assist in the startup and testing of the equipment included in this section. The duration of service shall be as required to complete the successful installation and startup of the equipment.
- B. Certify in writing to the ENGINEER and OWNER that the equipment included in this section was installed in accordance with this specification and the manufacturer's instructions.
- C. Conduct field tests to adequately show that the equipment has been properly installed and will function as specified herein. All tests shall be subject to review by the ENGINEER and OWNER. The tests shall demonstrate that under all conditions of operation, the equipment:
 - 1. has not been damaged by transportation or installation;
 - 2. has been properly installed;
 - 3. has no mechanical defects;
 - 4. has been properly connected;
 - 5. is free of overheating of any parts;
 - 6. is free of all objectionable vibration;
 - 7. is free of overloading of any parts.

Any defects in the equipment or installation or failure to meet the requirements of this specification shall be promptly corrected at the CONTRACTOR'S expense.

3.06 EQUIPMENT PERFORMANCE TESTS

- A. Refer to Section 019100 – Commissioning for field performance testing requirements.

SECTION 462160 - TRAVELING WATER SCREENS

3.07 TRAINING

- A. The manufacturer's representative shall instruct and train the OWNER'S operating personnel in proper operation and maintenance procedures for the new vertical traveling screen installed under this specification.
- B. Training sessions shall be conducted during the equipment performance period.
- C. Training shall be scheduled at least two weeks in advance so as to provide the OWNER an opportunity to adjust work schedules to permit all interested personnel to attend.
- D. At least seven (7) days prior to the training session, the CONTRACTOR shall supply the OWNER with a detailed training outline for the equipment.

3.08 SPARE PARTS

- A. Provide a full set of each of the following spare parts for each screen.
 - 1. Shear pins – 1 complete set for each screen.
 - 2. Fuses – 2 of each size for each control panel.
 - 3. Spray water nozzles – 1 complete set for each screen.
 - 4. Sprocket teeth inserts – 1 complete set for each screen.

END OF SECTION

APPENDIX A

WOMEN AND MINORITY BUSINESS ENTERPRISE POLICY

ERIE COUNTY WATER AUTHORITY

APPENDIX A

WOMEN AND MINORITY BUSINESS ENTERPRISE POLICY

ERIE COUNTY WATER AUTHORITY

It is the policy of the Authority to foster and encourage minority business enterprise participation in the construction contracts of the Authority. Through the setting of Minority Business Enterprise goals and careful monitoring of CONTRACTOR compliance, the Authority will ensure the fullest possible participation in construction activities by qualified minority and women-owned firms.

Some of the federal and state laws that provide the basis for Equal Employment Opportunity and Affirmative Action are:

1. Title VII, Civil Rights Act of 1964 (as amended by the Equal employment Opportunity Act of 1972): Prohibits employment discrimination because of race, color, sex, religion or national origin.
2. Executive Order 11246 (as amended by the Executive Order 11375): Requires Affirmative Action by all Federal CONTRACTORS and subcontractors and requires that all firms with Contracts over \$50,000.00 and 50 or more employees develop and implement written programs.
3. Equal Act of 1963: Requires employers to provide equal pay for men and women performing similar work.
4. New York State Human Rights Law: Prohibits discrimination based on race, color, sex, age, creed, disability, national origin and marital status in employment matters.
5. Flynn Act: Guarantees disabled citizens protection against discrimination in housing, employment, public accommodations, training programs and non-sectarian education due to mental, physical or medical disability.
6. Title VI, Civil Rights Act of 1964: Prohibits discrimination based on race, color or national origin in all programs which receive Federal aid.
7. Title IX, Education Amendments Act of 1972: Prohibits sex discrimination against students of any educational institution receiving Federal financial aid.

A. MINORITY BUSINESS UTILIZATION COMMITMENT

The Erie County Water Authority has established the following business utilization rules which requires all prime CONTRACTORS awarded construction contracts let by the Erie County Water Authority to exemplify Affirmative Action to sub-contract to minority business enterprise (MBE). For the purpose of these regulations, the term "Minority Business Enterprise" refers to a business at least fifty-one percent (51%) of which is owned and controlled by minority group members. Minority group members are citizens of the United States who are Women, Blacks, Hispanics and Native Americans. MBE's must demonstrate current certification of a government agency.

The Authority has determined that a goal of ten percent (10%) of the total contract value represents a fair share of minority business utilization on each construction contract awarded.

Recipients of Authority construction Contracts must utilize minority-owned business sources for supplies, services and professional services, allowing these sources the maximum feasible opportunity to compete for Contracts, Subcontracts and third-tier Contracts to be performed. All prime CONTRACTORS awarded Authority Contracts estimated to exceed \$100,000.00 must take positive steps to “afford fair opportunities to MBE’s”. Positive steps shall include, but not be limited to, (a) utilizing a source list of bona fide minority business enterprises, (b) solicitations of bids from MBE’s particularly of those located in Erie County, (c) giving minority firms sufficient time to submit proposals in response to solicitations and (d) maintaining records showing minority business enterprises and specific efforts to identify and award Contracts to these Companies.

Each CONTRACTOR bidding on an Erie County Water Authority contract is to contact MBE’s and solicit bids for various aspects of each project. The CONTRACTOR is to supply the Authority with information regarding contracts for services and products with minority business enterprises and the dollar amount of each contract on the Minority Business Utilization Report.

The Successful Bidder shall submit to the Authority the Minority Business Enterprise Utilization Report - Part A within one week of the bid opening. Part A includes a list of MBE’s from whom the CONTRACTOR has solicited bids, or with whom the CONTRACTOR has signed a binding contractual agreement. The Authority will not consider a CONTRACTOR’s bid where the CONTRACTOR fails to submit this report or where an examination of the report evidences failure by the CONTRACTOR to comply with the affirmative action requirements of the Contract.

In the event of a joint venture participating in this MBE Program, the Joint Venture Disclosure Affidavit must be submitted with Part A by all parties involved. Only to the extent that a minority business enterprise contributes to and is paid for its participation in a joint venture will that dollar be credited towards the 10% goal of minority participation in the Erie Country Water Authority MBE Program.

MBE’s must be approved by the Erie County Water Authority before their participation may be credited toward the 10% goal. Where the proposed MBE is not approved by the Authority, an Authority MBE/Disclosure Affidavit must be filed with the Contract Compliance office. Forms and lists of certified MBE’s can be obtained by calling Lavonya Lester, Director of Equal Employment Opportunity (ECWA) at (716) 685-8223.

A Minority Business Enterprise Utilization Waiver Request may be completed and submitted with the Minority Business Enterprise Utilization Report - Part A to the Authority within one week of the bid opening. Waivers shall be granted only where the availability of MBE’s in the market area of the project is less than the 10% goal.

Sufficient information must be provided on the Minority Business Enterprise Utilization Waiver Request to ascertain whether a waiver should be approved, conditionally approved or rejected by advice of the Equal Opportunity Office.

A waiver approval limits the CONTRACTOR’s obligation to solicit MBE’s for this particular project. It does not relieve the CONTRACTOR of MBE utilization for any other Erie County Water Authority project on which he submits a bid.

Conditional approval of the waiver request makes it necessary for the CONTRACTOR to continue soliciting MBE’s for contracting purposes, after he has been declared the low bidder.

A MBE Utilization Waiver Request will be rejected if the CONTRACTOR:

1. fails to provide information on the Minority Business Enterprise Utilization Report with his bid.
2. provides fraudulent information of the MBE reports.
3. fails to make an honest good faith effort to recruit and contract with MBE's or
4. takes any other action which is contrary to the spirit and intent of the law.

THE INFORMATION PROVIDED ON THE MBE WAIVER REQUEST AND THE MBE UTILIZATION REPORT WILL BE CONSIDERED CONCURRENTLY TO DETERMINE IF A WAIVER SHOULD BE APPROVED, CONDITIONALLY APPROVED OR REJECTED.

The low bidder shall submit to the Authority, within one week of the bid opening, a schedule for minority business enterprise participation, with whom the CONTRACTOR intends to subcontract, specifying the agreed price to be paid for such work, and identifying in detail the Contract item(s) or parts to be performed by each minority business enterprise. A letter of intent to enter into a Subcontract or purchase agreement, signed by the minority business, contingent upon the contract award, indicating the agreed upon price and scope of work, shall be provided, signed by both the CONTRACTOR and the minority business enterprise. The prime CONTRACTOR shall not substitute or delete the listed minority business enterprise without the written consent of the Erie County Water Authority.

In the event that the MBE goal for the contract is not met, the CONTRACTOR shall provide sufficient documentation to establish that every positive effort was made to identify, solicit and negotiate with MBE's in pursuit of the goal. Such documentation includes, but is not limited to, advertisement in minority-focused media, written contract with minority businesses indicating sufficient bidder's price along with evidence showing the work to be performed is the same, and not a reduced portion thereof.

The CONTRACTOR shall provide to the Erie County Water Authority copies of all subcontracts and/or purchase agreements with minority business enterprises within one week of the bid opening. A notice to proceed with construction shall not be issued until acceptable documentation is received.

When the project is thirty (30%) percent complete, the CONTRACTOR shall submit to the Authority the Minority Business Enterprise Utilization Report - Part B. Part B lists the MBE's on the project, the dollar amounts paid to that date and the estimated amount remaining to be spent.

The Minority Business Enterprise Utilization Report - Part C certifies the actual dollar amount expended to MBE's. Part C must be completed by the prime CONTRACTOR and submitted at the seventy-five (75%) percent payment level.

The Minority Business Enterprise Utilization Report - Part D certifies the total dollar amount expended to MBE's. Part D is to be submitted with the request for final payment.

In the event a CONTRACTOR fails to comply with these provisions the Authority may:

1. Summon the CONTRACTOR to a hearing
2. Withhold progress payments in part or in full
3. Cancel the contract.
4. Bar award of future Contracts until the CONTRACTOR can demonstrate that he will comply.

It is hereby the Erie County Water Authority's commitment to assure that on all contracts awarded, prime CONTRACTORS expend a fair share of the contract with bona fide minority businesses in accordance with the goals set forth by the Authority. Failure to comply with these provisions shall disqualify the bidder and shall constitute a breach of contract subject to all remedies available to the Authority.

The Prime CONTRACTOR and all minority Subcontractors are bound by all requirements as put forth in the Erie County Water Authority standard General Conditions and all modifications thereto contained in these Contract Specifications.

Listing of **AFFIRMATIVE ACTION FORMS ATTACHED:**

<u>NAME OF FORM</u>	<u>PAGE NUMBER(S)</u>
Minority Business Utilization Report- Part A	6 & 7
Waiver Request	8
Erie County Water Authority Minority Business Enterprise Joint Venture Disclosure Affidavit	9
Erie County Water Authority Minority Business Enterprise Utilization Report - Part B	10 & 11
Minority Business Enterprise Utilization Report - Part C	12
Minority Business Enterprise Utilization Report - Part D	13

**ERIE COUNTY WATER AUTHORITY
MINORITY BUSINESS ENTERPRISE
UTILIZATION REPORT - PART A**

This information must be submitted by the successful bidder within one week of bid opening.

COMPANY STC Construction, Inc.

AUTHORIZED REPRESENTATIVE Jason C. Rice, Vice President

ADDRESS 63 Zoar Valley Road, P.O. Box 459, Springville, NY 14141-0459

TELEPHONE NUMBER 716-592-3400

PROJECT NAME Sturgeon Point Raw Water Pump Station

PROJECT NUMBER NC-34

I. List actions taken to identify, solicit, and contact Minority Business Enterprises (MBE) to bid on subcontracts on this project.

1. Search MBE/WBE Resource Lists
2. Email and Phone Solicitations
3. Solicit MWBE Firms through Listing on Construction Exchange
4. Site Visits with Potential MBE Firms
5. _____
6. _____

II. List all bona fide Minority Business Enterprise, subcontractors, professional personnel, solicited, contracted, or presently negotiating a contract in accordance with the minority business utilization goal set forth by the Erie County Water Authority. (Attach additional sheets if necessary.)

MINORITY OWNED FIRM	SUPPLY/SERVICE	AMOUNT OF PROPOSAL	PRIOR CERTIFICATION	CONTRACT EXECUTED	REASON NOT AWARDED
Seneca Steel Erectors, Inc. NAME: 12130 Springville- ADDRESS: Boston Road TELE: Springville, NY 14141 IRS NO: 716-592-3350	Steel and Crane Work	\$190,337	MBE	YES _____ NO <u>X</u>	Awaiting Contract
Heatwave Heating and Cooling NAME: 16-1547888 ADDRESS: 100 John Glenn Dr, TELE NO: Amherst, NY 14228 IRS NO: (716) 891-9283	HVAC	\$ 40,725	WBE	YES _____ NO <u>X</u>	Awaiting Contract
NAME: _____ ADDRESS: _____ TELE NO: _____ IRS NO: _____				YES _____ NO _____	
NAME: _____ ADDRESS: _____ TELE NO: _____ IRS NO: _____				YES _____ NO _____	

PART A CONTINUED

III. Assistance offered by CONTRACTOR to MBE's as to bonding, union requirements, obtaining work capital etc...

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

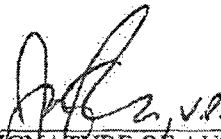
IV. Total Dollar Amount to be subcontracted to Minority Business Enterprise(s): \$ 231,062

V. Total Amount of Bid: (Adjusted)* \$ 2,202,073

VI. MBE Percent (%) of project bid: 10.5%

VII. YOU MUST ATTACH COPIES OF RELEVANT CORRESPONDENCE AND DOCUMENTS INCLUDING RETURN RECEIPTS.

11/22/16
DATE



SIGNATURE OF AUTHORIZED REPRESENTATIVE
Jason C. Rice, Vice President

Note: Within one week of the bid opening, this original form, together with a letter of intent to enter into a subcontract or purchase agreement, contingent upon the contract award, indicating the agreed upon price and scope of work, signed by both the CONTRACTOR and the Minority Business Enterprise, must be submitted to:

Lavonya Lester, Director of Equal Employment Opportunity (ECWA)
Erie County Water Authority
3030 Union Road
Buffalo, New York 14227

NOV 22 2016

Letter of Intent

To: LAVONIA LESTER
ERIE COUNTY WATER AUTHORITY
3030 UNION ROAD
BUFFALO, NY 14227

Date: 11/21/16

Project Name and Number NC-34 Sturgeon Point Raw Water Pump Station Improvements

Bid Amount: 3,512,506 M/WBE Goal: 10%

STC Construction, Inc. agrees to enter into a contractual agreement
Prime Contractor

with Heatwave Heating and Cooling who will provide the following goods/
MWBE Subcontractor

services in connection with the above referenced contract:

HVAC Work.

for an estimated amount of \$ \$ 40,725 totaling % of the total contract value.

Heatwave Heating and Cooling is currently certified with Erie County
(MWBE Subcontractor) and is able to function in the aforementioned capacity.

STC Construction, Inc.
Prime Contractor

Heatwave Heating and Cooling
MWBE Subcontractor

Intend to work on the above-named contract in accordance with Appendix A of the MWBE Section of the Erie County Water Authority Contract, contingent upon award of the contract to the aforementioned Prime Contractor.

[Signature]
Signed (Prime Contractor)

[Signature]
Signed (MWBE Subcontractor)

Jason C. Rice
Printed Signature

Robin Clay
Printed Signature

Vice President 11/21/16
Title Date

President 11/21/16
Title Date

Letter of Intent

To: LAVONIA LESTER
ERIE COUNTY WATER AUTHORITY
3030 UNION ROAD
BUFFALO, NY 14227

Date: 11/21/16

Project Name and Number NC-34 STURGEON POINT RAW WATER
PUMP STATION IMPROVEMENTS

(ADJUSTED)
Bid Amount: 2,202,073 MWBE Goal: 10%

STC CONSTRUCTION, INC. agrees to enter into a contractual agreement
Prime Contractor

with SENECA STEEL ERECTORS, INC. who will provide the following goods/
MWBE Subcontractor
services in connection with the above referenced contract:

STRUCTURAL STEEL & STEEL CRANE WORK

for an estimated amount of \$ 140,337 totaling 8.6 % of the total contract value.

SENECA STEEL ERECTORS is currently certified with NYS & ERIE COUNTY
(MWBE Subcontractor) and is able to function in the aforementioned capacity.

STC CONSTRUCTION, INC.
Prime Contractor

SENECA STEEL ERECTORS, INC.
MWBE Subcontractor

Intend to work on the above-named contract in accordance with Appendix A of the MWBE Section of the Erie County Water Authority Contract, contingent upon award of the contract to the aforementioned Prime Contractor.

[Signature]
Signed (Prime Contractor)

[Signature]
Signed (MWBE Subcontractor)

JASON C. PRICE
Printed Signature

JASON A. BISCUPI
Printed Signature

VICE PRESIDENT 11/21/16
Title Date

President 11/21/16
Title Date

WAIVER

COMPANY _____

ADDRESS _____

TELEPHONE NUMBER _____
(AREA CODE) (NUMBER)

1. CONTRACTOR has made a good faith effort to adopt subcontracting on this project to those trades, professions, supplies, etc. for which minority business enterprises bids could be solicited; and
2. The total percentage of the bids which could be Subcontracted in trades, professions, supplies, etc. for which minority business enterprises bids could be solicited is less than 10%.

A waiver, as provided for by the Erie County Water Authority is hereby requested on the grounds that there are no/insufficient (circle the appropriate term) minority business enterprise in the market area of this project which do subcontracting in the following fields (list all trades, professions, supplies, etc. which could be subcontracted on this project):

- | | |
|----------|-----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | 8. _____ |
| 4. _____ | 9. _____ |
| 5. _____ | 10. _____ |

(use additional sheets if necessary)

If a partial waiver is granted the CONTRACTOR will make a good faith effort to meet the reduced goal.

DATE

SIGNATURE OF AUTHORIZED REPRESENTATIVE OF COMPANY

Granted in whole _____

Granted in part _____

Comments _____

EQUAL OPPORTUNITY OFFICIAL / TITLE DATE

LETTING DEPARTMENT / TITLE DATE
REPRESENTATIVE

**ERIE COUNTY WATER AUTHORITY
MINORITY BUSINESS ENTERPRISE
JOINT VENTURE DISCLOSURE AFFIDAVIT**

To Be Submitted With Part A
Where Applicable

Joint Ventures: _____
Name: _____
Address: _____
Principal Office: _____
Office Phone: _____
Home Phone: _____

Percent of minority ownership in terms of profit and loss sharings:

Capital contributions by each joint venture and accounting therefore:

Equipment and supply contributions by each joint venturer and accounting therefore:

Any ownership options for ownership or loans between the joint venturers - identify terms thereof:

How and by whom the on-site work will be supervised and administered:

I, _____, as
representative of _____ Company,
do hereby swear or affirm that I am authorized to act on its behalf and that in this capacity and to
the best of my knowledge and belief, the information provided herewith relevant to the joint
venture of _____
is accurate, complete and current, and fairly represents the joint venture; further, that I have
personally reviewed the material and assured myself of its accuracy. It is recognized and
acknowledged that the statements herein are being given under oath and any material
misrepresentation will be grounds for terminating any contract which may be awarded in reliance
hereon.

SIGNATURE

**ERIE COUNTY WATER AUTHORITY
MINORITY BUSINESS ENTERPRISE UTILIZATION REPORT - PART B**

CONTRACTOR _____ CONTRACT NAME _____

- I. List all bona fide minority business enterprises, Subcontractors, suppliers, professional personnel, or joint venture firms, with whom you have entered into a binding agreement in accordance with the Minority Business Utilization Goal set forth by the Erie County Water Authority. Include minority trucking firms that will be utilized and included and estimated dollar amount. This information must be submitted to the Erie County Water Authority when the project is 30% complete.

(USE REVERSE SIDE IF MORE SPACE IS NEEDED) MINORITY OWNED FIRMS	TYPE OF WORK	DATE CONTRACT EXECUTED	TOTAL EXPENDED TO DATE	AMOUNT REMAINING
NAME: _____ ADDRESS: _____ IRS #: _____				
NAME: _____ ADDRESS: _____ IRS #: _____				

*Erie County Water Authority reserves the right to require documentation including, but not limited to, canceled checks to verify these amounts:

- II. Total Dollar Amount to be Subcontracted to minority Business Enterprise(s):
\$ _____
- III. Total dollar amount expended to date: \$ _____
- IV. Total amount of bid: \$ _____
- V. MBE Percent (%) of project bid: \$ _____

I, _____ as an official representative of _____
_____, do hereby certify that the information listed above is correct and complete.

NAME

TITLE

DATE

PART B CONTINUED

(USE REVERSE SIDE IF MORE SPACE IS NEEDED) MINORITY OWNED FIRMS	TYPE OF WORK	DATE CONTRACT EXECUTED	TOTAL EXPENDED TO DATE	AMOUNT REMAINING
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				
NAME: _____ ADDRESS: _____ _____ IRS #: _____				

**MINORITY BUSINESS ENTERPRISE UTILIZATION REPORT - PART C
CERTIFICATION OF EXPENDITURES TO MBE's**

(To be completed by the prime CONTRACTOR and
submitted at the 75% payment level)

CONTRACTOR _____

CONTRACT: _____

MBE	PART B CONTRACT AMOUNT OF ESTIMATE	TOTAL EXPENDED TO DATE	ESTIMATED AMOUNT REMAINING

* Erie County Water Authority reserves the right to require documentation including, but not limited to, canceled checks to verify these amounts.

I, _____
_____ as an official representative of _____,

do hereby certify that the information listed above is correct and complete.

NAME

TITLE

DATE

MINORITY BUSINESS ENTERPRISE UTILIZATION REPORT - PART D

FINAL CERTIFICATION OF EXPENDITURES TO MBE's

(to be completed by the prime CONTRACTOR and submitted with
the request for final payment)

CONTRACTOR: _____

CONTRACT: _____

MBE	TOTAL AMOUNT EXPENDED

TOTAL OF ALL MBE
SUB-CONTRACTS \$ _____

AMOUNT OF
CONTRACT _____

FINAL MBE
PERCENTAGE _____

I, _____, as an official
representative of _____,

do hereby certify that the information listed above is correct and complete.

NAME

TITLE

DATE

ACCOUNTABILITY

The CONTRACTOR shall be fully accountable for its performance under this contract and agrees to answer under oath all questions relevant to the performance thereof and to any transaction, act, or omission had, done or omitted in connection therewith if called before the Erie County Water Authority, any Judicial, County or State Officer or agency empowered to investigate the Contract or its performance.

APPENDIX B

INSURANCE REQUIREMENTS

ERIE COUNTY WATER AUTHORITY



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
11/21/2016

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER First Niagara Risk Management, Inc 726 Exchange Street Suite 900 Buffalo NY 14210		CONTACT NAME: Ken Starke PHONE (AG No. Ext.): (716) 819-5500 FAX (AG No.): (716) 819-5140 EMAIL: kenneth.starke@fnrm.com ADDRESS:	
INSURED STC Construction Inc. P.O. Box 459 Springville NY 14141		INSURER(S) AFFORDING COVERAGE INSURER A: American Zurich Insurance Co NAIC # 40142 INSURER B: Ace American Insurance Co 22667 INSURER C: Travelers Indemnity Co of 25666 INSURER D: INSURER E: INSURER F:	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

USER LTR	TYPE OF INSURANCE	ADDL SUBR INSR	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> Contractual <input checked="" type="checkbox"/> KCU Incl GENL AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC	X	02743 40142 A+ XV 8248386	3/1/2016	3/1/2017	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMPROP AGG \$ 2,000,000
A	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS <input checked="" type="checkbox"/> \$250 comp ded <input checked="" type="checkbox"/> \$500 coll ded	X	02743 40142 A+ XV 8248387	3/1/2016	3/1/2017	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
B	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 10,000	X	02257 22667 706571323003	3/1/2016	3/1/2017	EACH OCCURRENCE \$ 10,000,000 AGGREGATE \$ 10,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	8248385	3/1/2016	3/1/2017	<input checked="" type="checkbox"/> WC STATU-TORY LIMITS <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
C	Leased & Rented Equip		0766069786402 04003	3/1/2016	3/1/2017	Physical Damage 200,000
C	Install/Bldrs Risk		0766069786402 25666	3/1/2016	3/1/2017	Special Form 2,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
 Re: Contract No. NC-34; Sturgeon Point Raw Water Pump Station Improvements. Project # 201500175
 Erie County Water Authority is an Additional Insured on a primary and non-contributory basis in regard to the above General Liability, Automobile Liability and Umbrella Liability and a waiver of subrogation applies to the General Liability, Automobile Liability, Umbrella Liability and Workers Compensation to the extent covered by endorsement form(s) U-GL-1175-F CW Edition date 04/13, U-CA-424-F Edition date 04/11, X841789 Edition date 01/14, U-GL-925-B CW Edition date 12/01, U-CA-424-E NY Edition date 04/11, X841864 Edition date 01/14, WC000313 Edition date 04/84.

CERTIFICATE HOLDER Erie County Water Authority Attn: Anthony Alessi 295 Main St., Suite 350 Buffalo, NY 14203	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE X Bonetto/SWHITE
--	--



American Zurich Insurance Company

A.M. Best #: 002743 NAIC #: 40142 FEIN #: 333141762
 Domiciliary Address
 1400 American Lane
 Schaumburg, IL 60196-1056
 United States

Web: www.zurichna.com
 Phone: 800-987-3373
 Fax: 877-962-2587

Assigned to insurance companies that have, in our opinion, a superior ability to meet their ongoing insurance obligations.

Based on A.M. Best's analysis, [050457 - Zurich Insurance Group Ltd](#) is the AMB Ultimate Parent and identifies the topmost entity of the corporate structure. View a list of [operating insurance entities](#) in this structure.

Best's Credit Ratings

Financial Strength Rating View Definition	
Rating:	A+ (Superior)
Affiliation Code:	g (Group)
Financial Size Category:	XV (\$2 Billion or greater)
Outlook:	Negative
Action:	Affirmed
Effective Date:	October 02, 2015
Initial Rating Date:	June 30, 1982

Long-Term Issuer Credit Rating View Definition	
Long-Term:	aa-
Outlook:	Negative
Action:	Affirmed
Effective Date:	October 02, 2015
Initial Rating Date:	September 14, 2004

u Denotes [Under Review Best's Rating](#)

Best's Credit Rating Analyst
 Rating issued by: A.M. Best Rating Services, Inc.
 Senior Financial Analyst: Darian Ryan
 Senior Director: Michael J. Lagomarsino, CFA, FRM

Disclosure Information

[View A.M. Best's Rating Disclosure Form](#)

[A.M. Best Affirms Ratings and Revises Outlook to Negative for Zurich Insurance Company Limited and Some of Its Related Affiliates](#)
 October 02, 2015

Rating History

A.M. Best has provided ratings & analysis on this company since 1982.

Financial Strength	
Effective Date	Rating
10/2/2015	A+
11/26/2014	A+
11/21/2013	A+
11/27/2012	A+
11/18/2011	A+
11/19/2010	A+

Long-Term Issuer Credit	
Effective Date	Rating
10/2/2015	aa-
11/26/2014	aa-
11/21/2013	aa-
11/27/2012	aa-
11/18/2011	aa-
11/19/2010	aa-

AMB Credit Reports



ACE American Insurance Company (2)

A.M. Best #: 002257 NAIC #: 22667 FEIN #: 932971728

Mailing Address
P.O. Box 1000
Philadelphia, PA 19106
United States

[View Additional Address Information](#)



Assigned to insurance companies that have, in our opinion, a superior ability to meet their ongoing insurance obligations.

Web: www.aceusa.com
Phone: 215-640-1000

Based on A.M. Best's analysis, [059303 - Chubb Limited](#) is the AMB Ultimate Parent and identifies the topmost entity of the corporate structure. View a list of [operating insurance entities](#) in this structure.

Best's Credit Ratings	
Financial Strength Rating View Definition	
Rating:	A++ (Superior)
Affiliation Code:	g (Group)
Financial Size Category:	XV (\$2 Billion or greater)
Outlook:	Stable
Action:	Affirmed
Effective Date:	June 22, 2018
Initial Rating Date:	June 30, 1951
Long-Term Issuer Credit Rating View Definition	
Long-Term:	aa+
Outlook:	Stable
Action:	Affirmed
Effective Date:	June 22, 2016
Initial Rating Date:	August 16, 2005
u Denotes Under Review Best's Rating .	
Best's Credit Rating Analyst	
Rating issued by: A.M. Best Rating Services, Inc.	
Senior Financial Analyst: Darian Ryan	
Director: Jennifer Marshall, CPCU, ARM	
Disclosure Information	
	View A.M. Best's Rating Disclosure Form
	A.M. Best Removes From Under Review and Affirms Ratings of Chubb Limited and Most of Its Subsidiaries June 22, 2016

Rating History	
A.M. Best has provided ratings & analysis on this company since 1951.	
Financial Strength	
Effective Date	Rating
6/22/2016	A++
7/2/2015	A++u
4/30/2015	A++
4/11/2014	A++
6/14/2013	A+
6/12/2012	A+
Long-Term Issuer Credit	
Effective Date	Rating
6/22/2016	aa+
7/2/2015	aa+ u
4/30/2015	aa+
4/11/2014	aa+
6/14/2013	aa
6/12/2012	aa

Related Financial and Analytical Data



The Travelers Indemnity Company of America (2)

A.M. Best #: 004003 NAIC #: 25666 FEIN #: 565020487

Domiciliary Address
 One Tower Square
 Hartford, CT 06183
 United States

Web: www.travelers.com
 Phone: 860-277-0111
 Fax: 860-277-7002



Assigned to insurance companies that have, in our opinion, a superior ability to meet their ongoing insurance obligations.

Based on A.M. Best's analysis, 058470 - Travelers Companies, Inc. is the AMB Ultimate Parent and identifies the topmost entity of the corporate structure. View a list of operating insurance entities in this structure.

Best's Credit Ratings

Financial Strength Rating [View Definition](#)

Rating:	A++ (Superior)
Affiliation Code:	g (Group)
Financial Size Category:	XV (\$2 Billion or greater)
Outlook:	Stable
Action:	Affirmed
Effective Date:	July 22, 2016
Initial Rating Date:	June 30, 1951

Long-Term Issuer Credit Rating [View Definition](#)



Long-Term:	aa+
Outlook:	Stable
Action:	Affirmed
Effective Date:	July 22, 2016
Initial Rating Date:	April 18, 2005

u Denotes Under Review Best's Rating

Best's Credit Rating Analyst

Rating issued by: A.M. Best Rating Services, Inc.
 Director: Jennifer Marshall, CPCU, ARM

Disclosure Information

-  [View A.M. Best's Rating Disclosure Form](#)
-  [A.M. Best Affirms Ratings of The Travelers Companies, Inc. and Its Subsidiaries July 22, 2016](#)

Rating History

A.M. Best has provided ratings & analysis on this company since 1951.

Financial Strength

Effective Date	Rating
7/22/2016	A++
5/28/2015	A++
5/23/2014	A++
5/30/2013	A+
5/10/2012	A+

Long-Term Issuer Credit

Effective Date	Rating
7/22/2016	aa+
5/28/2015	aa+
5/23/2014	aa+
5/30/2013	aa
5/10/2012	aa

AMB Credit Reports



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
11/22/2016

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER First Niagara Risk Management, Inc 726 Exchange Street Suite 900 Buffalo NY 14210		CONTACT Ken Starks NAME: PHONE (716) 819-5500 FAX (716) 819-5140 (Alt. No. Ext.) EMAIL kenneth.starks@fnrm.com ADDRESS:	
INSURED STC Construction Inc. P.O. Box 459 Springville NY 14141		INSURER(S) AFFORDING COVERAGE INSURER A: Travelers Indemnity Co of 25666 INSURER B: INSURER C: INSURER D: INSURER E: INSURER F:	

COVERAGES CERTIFICATE NUMBER: Erie County Water Auth BR REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATION MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADOL (SUBR) (INSR) (W/O)	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY <input type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC					EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Per occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMPROP AGG \$ \$
	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS					COMBINED SINGLE LIMIT (Per accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input type="checkbox"/> RETENTION \$					EACH OCCURRENCE \$ AGGREGATE \$ \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N N/A				<input type="checkbox"/> WC STATUS <input type="checkbox"/> TDY LIMITS <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$
A	Install / Bldrs Risk		QT6605CS24016-TIL-16 09003 25666	11/21/2016 A++	11/31/2017 XV	Special Form \$3,512,506 Deductible \$10,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
 Project: Sturgeon Point Raw Water Pump Station Improvements - Contract No. NC-34

Designated Contractor: STC Construction, Inc.

APPROVED NOV 22 2016

CERTIFICATE HOLDER Erie County Water Authority Attn: Anthony Alessi 295 Main St., Suite 350 Buffalo, NY 14203	CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE M Bonetto/KSTARR
--	--

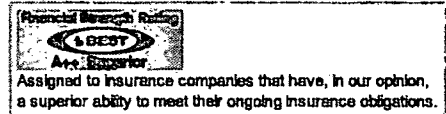


The Travelers Indemnity Company of America (2)

A.M. Best #: 004003 NAIC #: 25555 FEIN #: 586020487

Domestic Address
 One Tower Square
 Hartford, CT 06183
 United States

Web: www.travelers.com
 Phone: 860-277-0111
 Fax: 860-277-7002



Based on A.M. Best's analysis, 058470 - Travelers Companies, Inc. is the AMB Ultimate Parent and identifies the topmost entity of the corporate structure. View a list of operating insurance entities in this structure.

Best's Credit Ratings

Financial Strength Rating [View Definition](#)

Rating:	A++ (Superior)
Affiliation Code:	g (Group)
Financial Size Category:	XV (\$2 Billion or greater)
Outlook:	Stable
Action:	Affirmed
Effective Date:	July 22, 2016
Initial Rating Date:	June 30, 1951

Long-Term Issuer Credit Rating [View Definition](#)

Long-Term:	aa+
Outlook:	Stable
Action:	Affirmed
Effective Date:	July 22, 2016
Initial Rating Date:	April 18, 2005

u Denotes Under Review Best's Rating

Best's Credit Rating Analyst

Rating issued by: A.M. Best Rating Services, Inc.

Director: Jennifer Marshall, CPCU, ARM

Disclosure Information



[View A.M. Best's Rating Disclosure Form](#)



[A.M. Best Affirms Ratings of The Travelers Companies, Inc. and Its Subsidiaries](#)
 July 22, 2016

Rating History

A.M. Best has provided ratings & analysis on this company since 1951.

Financial Strength

Effective Date	Rating
7/22/2016	A++
5/28/2015	A++
5/23/2014	A++
5/30/2013	A+
5/10/2012	A+

Long-Term Issuer Credit

Effective Date	Rating
7/22/2016	aa+
5/28/2015	aa+
5/23/2014	aa+
5/30/2013	aa
5/10/2012	aa

AMB Credit Reports

STATE OF NEW YORK
WORKERS' COMPENSATION BOARD

CERTIFICATE OF NYS WORKERS' COMPENSATION INSURANCE COVERAGE

<p>1a. Legal Name & Address of Insured (Use street address only) STC Construction Inc. 63 Zoar Valley Rd. P.O. Box 459 Springville, NY 14141</p> <p><i>Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., a Wrap-Up Policy)</i></p>	<p>1b. Business Telephone Number of Insured 716-592-3400</p> <p>1c. NYS Unemployment Insurance Employer Registration Number of Insured</p> <p>1d. Federal Employer Identification Number of Insured or Social Security Number 16-1513984</p>
<p>2. Name and Address of the Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) Erie County Water Authority 295 Main Street, Suite 350 Buffalo, NY 14203</p>	<p>3a. Name of Insurance Carrier 02563 Zurich American Ins Co 16535</p> <p>3b. Policy Number of entity listed in box "1a" A+XV 8248385</p> <p>3c. Policy effective period 03/01/16 to 03/01/17</p> <p>3d. The Proprietor, Partners or Executive Officers are <input checked="" type="checkbox"/> included. (Only check box if all partners/officers included) <input type="checkbox"/> all excluded or certain partners/officers excluded.</p>


This certifies that the insurance carrier indicated above in box "3" insures the business referenced above in box "1a" for workers' compensation under the New York State Workers' Compensation Law. (To use this form, New York (NY) must be listed under Item 3A on the **INFORMATION PAGE** of the workers' compensation insurance policy). The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity listed above as the certificate holder in box "2".

The Insurance Carrier will also notify the above certificate holder within 10 days IF a policy is canceled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from the coverage indicated on this Certificate. (These notices may be sent by regular mail.) Otherwise, this Certificate is valid for one year after this form is approved by the insurance carrier or its licensed agent, or until the policy expiration date listed in box "3c", whichever is earlier.

Please Note: Upon the cancellation of the workers' compensation policy indicated on this form, if the business continues to be named on a permit, license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of Workers' Compensation Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law.

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has the coverage as depicted on this form.

Approved by: Michael R Bonetto
(Print name of authorized representative or licensed agent of insurance carrier)

Approved by:  11/21/2016
(Signature) (Date)

Title: First Vice President

Telephone Number of authorized representative or licensed agent of insurance carrier: 716-819-5885

Please Note: Only insurance carriers and their licensed agents are authorized to issue Form C-105.2. Insurance brokers are NOT authorized to issue it.

Workers' Compensation Law

Section 57. Restriction on issue of permits and the entering into contracts unless compensation is secured.

1. The head of a state or municipal department, board, commission or office authorized or required by law to issue any permit for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, and notwithstanding any general or special statute requiring or authorizing the issue of such permits, shall not issue such permit unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter. Nothing herein, however, shall be construed as creating any liability on the part of such state or municipal department, board, commission or office to pay any compensation to any such employee if so employed.

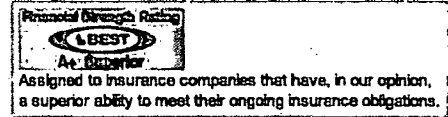
2. The head of a state or municipal department, board, commission or office authorized or required by law to enter into any contract for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, notwithstanding any general or special statute requiring or authorizing any such contract, shall not enter into any such contract unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter.



Zurich American Insurance Company

A.M. Best #: 002563 NAIC #: 16535 FEIN #: 384233459
 Administrative Office
 1400 American Lane
 Schaumburg, IL 60196-1056
 United States

[View Additional Address Information](#)



Web: www.zurichna.com
 Phone: 800-987-3373
 Fax: 877-962-2567

Based on A.M. Best's analysis, 050457 - Zurich Insurance Group Ltd is the AMB Ultimate Parent and identifies the topmost entity of the corporate structure. View a list of [operating insurance entities](#) in this structure.

Best's Credit Ratings

Financial Strength [View Definition](#)

Rating:	A+ (Superior)
Affiliation Code:	g (Group)
Financial Size Category:	XV (\$2 Billion or greater)
Outlook:	Negative
Action:	Affirmed
Effective Date:	October 02, 2015
Initial Rating Date:	June 30, 1922

Long-Term Issuer Credit Rating [View Definition](#)

Long-Term:	aa-
Outlook:	Negative
Action:	Affirmed
Effective Date:	October 02, 2015
Initial Rating Date:	September 14, 2004

u Denotes [Under Review Best's Rating](#)

Best's Credit Rating Analyst
 Rating issued by: A.M. Best Rating Services, Inc.
 Senior Financial Analyst: Darian Ryan
 Senior Director: Michael J. Legomarsino, CFA, FRM

Disclosure Information

[View A.M. Best's Rating Disclosure Form](#)

[A.M. Best Affirms Ratings and Revises Outlook to Negative for Zurich Insurance Company Limited and Some of Its Rated Affiliates](#)
 October 02, 2015

Rating History

A.M. Best has provided ratings & analysis on this company since 1922.

Financial Strength

Effective Date	Rating
10/2/2015	A+
11/26/2014	A+
11/21/2013	A+
11/27/2012	A+
11/18/2011	A+
11/19/2010	A+

Long-Term Issuer Credit

Effective Date	Rating
10/2/2015	aa-
11/26/2014	aa-
11/21/2013	aa-
11/27/2012	aa-
11/18/2011	aa-
11/19/2010	aa-

Related Financial and Analytical Data



Workers' Compensation Board

CERTIFICATE OF INSURANCE COVERAGE UNDER THE NYS DISABILITY BENEFITS LAW

PART 1. To be completed by Disability Benefits Carrier or Licensed Insurance Agent of that Carrier

<p>1a. Legal Name and Address of Insured (Use street address only) STC Construction Inc. 63 Zoar Valley Rd. Springville, NY 14141-9247</p>	<p>1b. Business Telephone Number of Insured (716) 592-3400</p> <p>1c. NYS Unemployment Insurance Employer Registration Number of Insured</p> <p>1d. Federal Employer Identification Number of Insured or Social Security Number 16-1513964</p>
<p>2. Name and Address of the Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder) Erie County Water Authority. 3030 Union Road Buffalo, NY 14227</p>	<p>3a. Name of Insurance Carrier ShelterPoint Life Insurance Company 09877</p> <p>3b. Policy Number of entity listed in box "1 a", D451352 81434</p> <p>3c. Policy effective period: 9/1/2016 to 9/1/2017 A-VII</p>

4. Policy covers:

a. All of the employer's employees eligible under the New York Disability Benefits Law

b. Only the following class or classes of the employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability Benefits insurance coverage as described above.

Date Signed 11/22/2016 By [Signature]
 (Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number (716) 849-8618 Title Managing Partner

IMPORTANT: If box "4a" is checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.

If box "4b" is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the Disability Benefits Law. It must be mailed for completion to the Workers' Compensation Board, DB Plans Acceptance Unit, 329 State Street, Schenectady, New York 12305.

PART 2. To be completed by NYS Workers' Compensation Board (Only if box "4b" of Part 1 has been checked)

**State Of New York
Workers' Compensation Board**

According to information maintained by the NYS Workers' Compensation Board, the above-named employer has complied with the NYS Disability Benefits Law with respect to all of his/her employees.

Date Signed _____ By _____
 (Signature of NYS Workers' Compensation Board Employee)

Telephone Number _____ Title _____

Please Note: Only insurance carriers licensed to write NYS disability benefits insurance policies and NYS licensed insurance agents of those insurance carriers are authorized to issue Form DB-120. 1. Insurance brokers are NOT authorized to issue this form.

APPROVED NOV 22 2016

Additional Instructions for Form DB-120.1

By Signing this form, the insurance carrier identified in box "3" on this form is certifying that it is insuring the business referenced in box "1a" for disability benefits under the New York State Disability Benefits Law. The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity as listed as the certificate

Will the carrier notify the certificate holder within 10 days of a policy being cancelled for non-payment of premium or within 30 days if cancelled for any other reason or if the insured is otherwise eliminated from the coverage indicated on this certificate prior to the end of the policy effective period? YES NO

This certificate may be used as evidence of a Disability Benefits contract of insurance only while the underlying policy is in effect.

Please Note: Upon the cancellation of the disability benefits policy indicated on this form, if the business continues to be named on a permit license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of NYS Disability Benefits Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Disability Benefits Law.

DISABILITY BENEFITS LAW

§220. Subd. 8

(a) The head of a state or municipal department, board, commission or office authorized or required by law to issue any permit for or in connection with any work involving the employment of employees in employment as defined in this article, and notwithstanding any general or special statute requiring or authorizing the issue of such permits, shall not issue such permit unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that the payment of disability benefits for all employees has been secured as provided by this article. Nothing herein, however, shall be construed as creating any liability on the part of such state or municipal department, board, commission or office to pay any disability benefits to any such employee if so employed.

(b) The head of a state or municipal department, board, commission or office authorized or required by law to enter into any contract for or in connection with any work involving the employment of employees in employment as defined in this article, and notwithstanding any general or special statute requiring or authorizing any such contract, shall not enter into any such contract unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that the payment of disability benefits for all employees has been secured as provided by this article.



ShelterPoint Life Insurance Company

A.M. Best #: 005877 NAIC #: 61434 FEIN #: 112294118
 Domiciliary Address
 600 Northern Boulevard Suite 310
 Great Neck, NY 11021-5202
 United States

Web: www.shelterpoint.com
 Phone: 516-829-8100
 Fax: 516-504-8412

Assigned to insurance companies that have, in our opinion, an excellent ability to meet their ongoing insurance obligations.

Based on A.M. Best's analysis, 055760 - ShelterPoint Group, Inc. is the AMB Ultimate Parent and identifies the topmost entity of the corporate structure. View a list of [operating insurance entities](#) in this structure.

Best's Credit Ratings

Financial Strength Rating [View Definition](#)

Rating:	A- (Excellent)
Financial Size Category:	VII (\$50 Million to \$100 Million)
Outlook:	Stable
Action:	Affirmed
Effective Date:	August 25, 2016
Initial Rating Date:	June 30, 1990

Long-Term Issuer Credit Rating [View Definition](#)

Long-Term:	B-
Outlook:	Stable
Action:	Affirmed
Effective Date:	August 25, 2016
Initial Rating Date:	June 28, 2007

u Denotes Under Review Best's Rating

Best's Credit Rating Analyst

Rating issued by: A.M. Best Rating Services, Inc.
 Senior Financial Analyst: Kathryn Steffanelli
 Director: Joseph R. Zazzera

Disclosure Information

[View A.M. Best's Rating Disclosure Form](#)

Rating History

A.M. Best has provided ratings & analysis on this company since 1990.

Financial Strength

Effective Date	Rating
8/25/2016	A-
8/11/2015	A-
11/20/2014	A-
8/29/2014	A-
8/25/2013	A-
9/26/2012	A-
9/21/2011	A-

Long-Term Issuer Credit

Effective Date	Rating
8/25/2016	B-
8/11/2015	B-
11/20/2014	B-
8/29/2014	B-
8/25/2013	B-
9/26/2012	B-
9/21/2011	B-

Related Financial and Analytical Data

Erie County Water Authority Insurance Requirements for Contracting Services

Project Number: 201500175

Description: NC-34 Sturgeon Point Raw Water Pump Station Improvements.

The following minimum insurance requirements shall apply to contractors providing services to the Erie County Water Authority (ECWA). If a service or project, in the opinion of ECWA, represents an unusual or exceptional risk, ECWA may establish additional insurance requirements for that service or project. All insurance required herein shall be obtained at the sole cost and expense of the contractor, including deductibles and self-insured retentions, and shall be in full force and effect on the contract commencement date and for the duration of the contract. These requirements include but are not limited to the minimum insurance requirements.

An X indicates insurance coverage is required.

X **Commercial General Liability Insurance:** (including, but not limited to, Bodily (Personal) Injury, Premises Operations, Property Damage Liability (broad form), Contractual Liability, Advertising Injury, Independent Contractors, Product Liability, Completed Operations Liability and Explosion, Collapse and Underground Coverage) – in an amount not less than \$1,000,000 combined single limit and \$2,000,000 in the aggregate:

- Per Policy
- Per Project or Job
- Per Location

There should be no exclusions for any claims filed, actual or alleged, for violation of any applicable statute including, but not limited to, the New York State or federal labor laws, ordinances, administrative orders, executive orders, rules, regulations, or decrees of any court of competent jurisdiction.

X **Commercial Business Automobile Insurance** in an amount of not less than \$1,000,000 each accident and shall cover liability arising out of any automobile owned, leased, hired, borrowed and non-owned automobiles. Additionally, if vehicles are used for transporting hazardous materials, the contractor shall obtain and maintain the “broadened” coverage (endorsement CA 99 48), as well as proof of MCS 90 04 00.

Excess Umbrella Liability Insurance in an amount of not less than:

\$1,000,000 in the aggregate

\$2,000,000 in the aggregate

\$3,000,000 in the aggregate

\$4,000,000 in the aggregate

\$5,000,000 in the aggregate

Per Policy

Per Project or Job

Per Location

All-Risk Installation Floater: Builder's risk completed value form based on the total value of the project, providing coverage for work performed, equipment, supplies and materials at the project location, as well as any off-site storage location.

Pollution Legal Liability Insurance in an amount of not less than:

\$1,000,000 in the aggregate

\$2,000,000 in the aggregate

\$3,000,000 in the aggregate

\$4,000,000 in the aggregate

\$5,000,000 in the aggregate

Per Policy

Per Project or Job

Per Location

And, if disposal of materials is involved, the disposal site operator must carry

Pollution Legal Liability Insurance in an amount of not less than:

___ \$1,000,000 in the aggregate

___ \$2,000,000 in the aggregate

___ \$3,000,000 in the aggregate

___ \$4,000,000 in the aggregate

___ \$5,000,000 in the aggregate

___ **Per Policy**

___ **Per Project or Job**

___ **Per Location**

X Workers' Compensation and Employers' Liability and New York State Disability Benefits Insurances, as required by New York State statute. If employees of the contractor will be working on or near navigable waters, US Longshore and Harbor Workers Compensation Act endorsement must be included.

Certificates of Insurance, on forms approved by the New York State Department of Insurance, must be submitted to ECWA prior to the award of contract. Renewals of Certificates of Insurance, on forms approved by the New York State Department of Insurance, must be received by ECWA 30 days prior to the expiration of the insurance policy period.

Certificates of Insurance and renewals, on forms approved by the New York State Department of Insurance, must be submitted to ECWA prior to the award of contract. Each insurance carrier issuing a Certificate of Insurance shall be rated by A. M. Best no lower than "A-" with a Financial Strength Code (FSC) of at least VII. The professional service provider shall name ECWA, its officers, agents and employees as additional insured on a Primary and Non-Contributory Basis, including a Waiver of Subrogation endorsement (form CG 20 26 11 85 or equivalent), on all applicable liability policies. Any liability coverage on a "claims made" basis should be designated as such on the Certificate of Insurance.

To avoid confusion with similar insurance company names and to properly identify the insurance company, please make sure that the insurer's National Association of Insurance Commissioners (N.A.I.C.) identifying number or A. M. Best identifying number appears

on the Certificate of Insurance. Also, at the top of the Certificate of Insurance, please list the project number.

Acceptance of a Certificate of Insurance and/or approval by ECWA shall not be construed to relieve the outside vendor of any obligations, responsibilities or liabilities.

Certificates of Insurance should be e-mailed to AALESSI@ECWA.ORG. or mailed to Mr. Anthony Alessi, ECWA Claims Representative/Risk Manager, Erie County Water Authority, 295 Main Street – Room 350, Buffalo, New York 14203-2494, or If you have any questions you can contact Mr. Alessi by e-mail or phone (716) 849-8477.

Please refer to the bid and the contract document(s) for additional information regarding insurance requirements.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
INSURED	E-MAIL ADDRESS:	
	PRODUCER CUSTOMER ID #:	
	INSURER(S) AFFORDING COVERAGE	
	NAIC #	
	INSURER A :	
	INSURER B :	
INSURER C :		
INSURER D :		
INSURER E :		
INSURER F :		

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR	WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY						
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE \$ 1,000,000
	<input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 100,000
	<input checked="" type="checkbox"/> Blanket Broad Form Contractual	X	X				MED EXP (Any one person) \$ 5,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PERSONAL & ADV INJURY \$ 1,000,000
	<input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC						GENERAL AGGREGATE \$ 2,000,000
	AUTOMOBILE LIABILITY						PRODUCTS - COMP/OP AGG \$ 2,000,000
	<input checked="" type="checkbox"/> ANY AUTO						
	<input type="checkbox"/> ALL OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000
	<input type="checkbox"/> SCHEDULED AUTOS	X	X				BODILY INJURY (Per person) \$
	<input type="checkbox"/> HIRED AUTOS						BODILY INJURY (Per accident) \$
	<input type="checkbox"/> NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident) \$
	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR						
	<input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE	X	X				EACH OCCURRENCE \$
	DEDUCTIBLE						AGGREGATE \$
	<input checked="" type="checkbox"/> RETENTION \$ 10,000						\$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						\$
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)	Y/N					
	If yes, describe under DESCRIPTION OF OPERATIONS below		N/A				
							WC STATUTORY LIMITS \$
							OTHER \$
							E.L. EACH ACCIDENT \$
							E.L. DISEASE - EA EMPLOYEE \$
							E.L. DISEASE - POLICY LIMIT \$

SAMPLE

Per Specific Agreement
SUBMIT proof of Workers Compensation and disability as per examples attached

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)
Additional Insured on a Primary and non-contributory basis: Erie County Water Authority
Additional Insured endorsement CG 20 10 11 85 or equivalent

CERTIFICATE HOLDER	CANCELLATION
Erie County Water Authority 295 Main St, Suite 350 Buffalo, NY 14203 Attn: Anthony Alessi	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE

Understanding New York Workers Compensation Board Workers Compensation and N.Y.S Disability Benefits Liability

This is a brief description for governmental organizations to validate vendor workers compensation and NYS Disability Benefits coverage. These requirements should be used when applying for permits, licenses or secure contracts. Copies should be obtained not only at the initial issuance but at renewal as well. A full instruction manual can be obtained from the Workers Comp Board.

The forms discussed are:

- 1) Form CE-200- Affidavit of Exemption (obtain at: www.wcb.state.ny.us/content/ebiz/wc_db_exemptions/requestExemptionOverview.jsp)
 - Acceptable proof that the business listed is exempt from providing workers' compensation and/or disability insurance coverage.

- 2) Workers Compensation
 - Form C-105.2: Certificate of Workers Compensation (WC) (Obtain from your insurance agent)
 - All private NYS licensed workers' compensation carriers are required to issue the C-105.2.

 - Form SI- 12: Certificate of WC when self-insured. (Obtain from workers compensation board)
 - Only the Self-Insurance Office of the Workers' Compensation Board issues the SI-12. The Self-Insurance Office can be contacted at **518-402-0247**. **Only one legal name and Federal Employer Identification Number can be listed on each Form SI-12. (Multiple legal entities must not be listed.)**

 - Form GSI- 105.2: Certificate of WC when participating in a group self-insured program.
 - The self-insurance administrator of the group completes the form.

 - Form U-26.3: Certificate of WC
 - Acceptable proof that the business has workers' compensation coverage through the New York State Insurance Fund. Only available through (NYSIF).

- 3) New York State Disability Benefits Law (DBL)
 - Form DB-120.1: Certificate of DBL Insurance (obtain from workers compensation board)
 - The DB-120.1 must be completed by either the NYS statutory disability benefits insurance carrier, or a licensed NYS insurance agent of that carrier. The form can be obtained by contacting the Bureau of Compliance. (certificates@wcb.state.ny.us)

 - Form DB-155: Certificate of DBL Self-Insurance
 - The Self-Insurance Office of the Workers' Compensation Board issues the DB-155. The Board's secretary will approve the DB-155. The Self-Insurance Office can be contacted at **518-402-0247**.

- 4) Exemption 1, 2, 3, or 4 Family, Owner Occupied residence (<http://www.wcb.state.ny.us/content/main/forms/bp-1.pdf>)

NOTE: ACORD Certificates of Insurance are not acceptable proof. Must use one of the forms noted above:

Form CE-200



**Certificate of Attestation of Exemption
From New York State Workers' Compensation
and/or Disability Benefits Insurance Coverage**

This form cannot be used to waive the workers' compensation rights or obligations of any party.

The applicant may use this Certificate of Attestation of Exemption ONLY to show a government entity that New York State specific workers' compensation and/or disability benefits insurance is not required. The applicant may NOT use this form to show another business or that business's insurance carrier that such insurance is not required.

Please provide this form to the government entity from which you are requesting a permit, license or contract. This Certificate will not be accepted by government officials one year after the date printed on the form.

<p align="center">In the Application of (Legal Entity Name and Address):</p> <p>JOHN SMITH 123 MAIN STREET ALBANY, NY 12207 111-111-1111 Federal ID Number: XXXXX6789</p>	<p align="center">Business Applying For: BUILDING PERMIT</p> <p>From: CITY OF ALBANY, DEPT OF BUILDING AND CODES</p> <p>The location of where work will be performed is 123 ACME AVENUE, ALBANY, NY 12203.</p> <p>Estimated dates necessary to complete work associated with the building permit are from October 14, 2008 to March 31, 2009.</p> <p>The estimated dollar amount of project is \$25,001 - \$50,000</p>
---	---

Workers' Compensation Exemption Statement:

The above named business is certifying that it is **NOT REQUIRED TO OBTAIN NEW YORK STATE SPECIFIC WORKERS' COMPENSATION INSURANCE COVERAGE** for the following reason:

The business is owned by one individual and is not a corporation. Other than the owner, there are no employees, day labor, leased employees, borrowed employees, part-time employees, unpaid volunteers (including family members) or subcontractors.

Disability Benefits Exemption Statement:

The above named business is certifying that it is **NOT REQUIRED TO OBTAIN NEW YORK STATE STATUTORY DISABILITY BENEFITS INSURANCE COVERAGE** for the following reason:

The business is owned by one individual or is a partnership (LLC, LLP, PLLP or a RLLP) under the laws of New York State and is not a corporation; or is a one or two person owned corporation, with those individuals owning all of the stock and holding all offices of the corporation (in a two person owned corporation, each individual must be an officer and own at least one share of stock) or is a business with no NYS location. In addition, the business does not require disability benefits coverage at this time since it has not employed one or more individuals on at least 30 days in any calendar year in New York State. (Independent contractors are not considered to be employees under the Disability Benefits Law.)

I, JOHN SMITH, am the Sole Proprietor with the above-named legal entity. I affirm that due to my position with the above-named business I have the knowledge, information and authority to make this Certificate of Attestation of Exemption. I hereby affirm that the statements made herein are true, that I have not made any materially false statements and I make this Certificate of Attestation of Exemption under the penalties of perjury. I further affirm that I understand that any false statement, representation or concealment will subject me to felony criminal prosecution, including jail and civil liability in accordance with the Workers' Compensation Law and all other New York State laws. By submitting this Certificate of Attestation of Exemption to the government entity listed above I also hereby affirm that if circumstances change so that workers' compensation insurance and/or disability benefits coverage is required, the above-named legal entity will immediately acquire appropriate New York State specific workers' compensation insurance and/or disability benefits coverage and also immediately furnish proof of that coverage on forms approved by the Chair of the Workers' Compensation Board to the government entity listed above.

SIGN HERE	<p>Signature: _____</p> <p>Date: _____</p>	
<p>Exemption Certificate Number</p> <p>2008-00197</p>		<p>Received</p> <p>October 2, 2008</p> <p>NYS Workers' Compensation Board</p>

CE-200 (Draft 05/02/08)

STATE OF NEW YORK
WORKERS' COMPENSATION BOARD

CERTIFICATE OF NYS WORKERS' COMPENSATION INSURANCE COVERAGE

<p>1a. Legal Name & Address of Insured (Use street address only)</p> <p>Work Location of Insured (Only required if coverage is specifically limited to certain locations in New York State, i.e., a Wrap-Up Policy)</p>	<p>1b. Business Telephone Number of Insured</p> <p>1c. NYS Unemployment Insurance Employer Registration Number of Insured</p> <p>1d. Federal Employer Identification Number of Insured or Social Security Number</p>
<p>2. Name and Address of the Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)</p>	<p>3a. Name of Insurance Carrier</p> <p>3b. Policy Number of entity listed in box "1a"</p> <p>3c. Policy effective period _____ to _____</p> <p>3d. The Partners, Partners or Executive Officers are included. (Only check box if all partners/officers included) all excluded or certain partners/officers excluded.</p>

This certifies that the insurance carrier indicated above in box "3" insures the business referenced above in box "1a" for workers' compensation under the New York State Workers' Compensation Law. (To use this form, New York (NY) must be listed under **Item 3A** on the INFORMATION PAGE of the workers' compensation insurance policy). The Insurance Carrier or its licensed agent will send this Certificate of Insurance to the entity listed above as the certificate holder in box "2".

The Insurance Carrier will also notify the above certificate holder within 10 days IF a policy is canceled due to nonpayment of premiums or within 30 days IF there are reasons other than nonpayment of premiums that cancel the policy or eliminate the insured from the coverage indicated on this Certificate. (These notices may be sent by regular mail.) Otherwise, this Certificate is valid for one year after this form is approved by the insurance carrier or its licensed agent, or until the policy expiration date listed in box "3c", whichever is earlier.

Please Note: Upon the cancellation of the workers' compensation policy indicated on this form, if the business continues to be named on a permit, license or contract issued by a certificate holder, the business must provide that certificate holder with a new Certificate of Workers' Compensation Coverage or other authorized proof that the business is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law.

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has the coverage as depicted on this form.

Approved by: _____
(Print name of authorized representative or licensed agent of insurance carrier)

Approved by: _____
(Signature) (Date)

Title: _____

Telephone Number of authorized representative or licensed agent of insurance carrier: _____

Please Note: Only insurance carriers and their licensed agents are authorized to issue Form C-105.2. Insurance brokers are NOT authorized to issue it.

Workers' Compensation Law

Section 57. Restriction on issue of permits and the entering into contracts unless compensation is secured.

1. The head of a state or municipal department, board, commission or office authorized or required by law to issue any permit for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, and notwithstanding any general or special statute requiring or authorizing the issue of such permits, shall not issue such permit unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter. Nothing herein, however, shall be construed as creating any liability on the part of such state or municipal department, board, commission or office to pay any compensation to any such employee if so employed.

2. The head of a state or municipal department, board, commission or office authorized or required by law to enter into any contract for or in connection with any work involving the employment of employees in a hazardous employment defined by this chapter, notwithstanding any general or special statute requiring or authorizing any such contract, shall not enter into any such contract unless proof duly subscribed by an insurance carrier is produced in a form satisfactory to the chair, that compensation for all employees has been secured as provided by this chapter.

SAMPLE



STATE OF NEW YORK
WORKERS' COMPENSATION BOARD
SELF-INSURANCE OFFICE
20 PARK STREET - ROOM 206
ALBANY, NY 12207



(518) 402-0247
FAX (518) 402-6199

COMPLIANCE WITH DISABILITY BENEFITS LAW
(Pursuant To Section 210, subd. 3 of the Disability Benefits Law)

EMPLOYER	FEDERAL EMPLOYER IDENTIFICATION NUMBER
	LOCATION OF OPERATION
ADDRESS (HOME OR MAIN OFFICE)	OPERATIONS TO BEGIN ON OR ABOUT:

There are on file with the Workers' Compensation Board, documents indicating that the above-named employer has complied with the Disability Benefits Law with respect to all of his or her employees in the following manner:

- By approved self-insurance pursuant to Section 211, subdivision 3 of the Disability Benefits Law.
- By a combination of approved self-insurance pursuant to Section 211, subdivision 3 of the Disability Benefits Law and insurance with authorized insurance carrier(s).

Date:

By: _____
Gina Wagoner
WC Examiner

DB-155 (3-04)

THIS AGENCY EMPLOYS & SERVES PEOPLE WITH DISABILITIES WITHOUT DISCRIMINATION.



New York State Insurance Fund

Workers' Compensation & Disability Benefits Specialists Since 1914

199 CHURCH STREET, NEW YORK, N.Y. 10007-1100
Phone: (888) 997-3863

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

POLICYHOLDER		CERTIFICATE HOLDER	
POLICY NUMBER	CERTIFICATE NUMBER	PERIOD COVERED BY THIS CERTIFICATE 01/01/2009 TO 05/01/2010	DATE 1/8/2009

THIS IS TO CERTIFY THAT THE POLICYHOLDER NAMED ABOVE IS INSURED WITH THE NEW YORK STATE INSURANCE FUND UNDER POLICY NO. 2058 840-6 UNTIL 05/01/2010, COVERING THE ENTIRE OBLIGATION OF THIS POLICYHOLDER FOR WORKERS' COMPENSATION UNDER THE NEW YORK WORKERS' COMPENSATION LAW WITH RESPECT TO ALL OPERATIONS IN THE STATE OF NEW YORK, EXCEPT AS INDICATED BELOW.

IF SAID POLICY IS CANCELLED, OR CHANGED PRIOR TO 05/01/2010 IN SUCH MANNER AS TO AFFECT THIS CERTIFICATE, 10 DAYS WRITTEN NOTICE OF SUCH CANCELLATION WILL BE GIVEN TO THE CERTIFICATE HOLDER ABOVE, NOTICE BY REGULAR MAIL SO ADDRESSED SHALL BE SUFFICIENT COMPLIANCE WITH THIS PROVISION. THE NEW YORK STATE INSURANCE FUND DOES NOT ASSUME ANY LIABILITY IN THE EVENT OF FAILURE TO GIVE SUCH NOTICE.

THIS CERTIFICATE DOES NOT APPLY TO BUILDING DEMOLITION.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS NOR INSURANCE COVERAGE UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICY.

NEW YORK STATE INSURANCE FUND

DIRECTOR, INSURANCE FUND UNDERWRITING

This certificate can be validated on our web site at <https://www.nysif.com/cert/certval.asp> or by calling (888) 875-5790
VALIDATION NUMBER: 107031806

STATE OF NEW YORK
WORKERS' COMPENSATION BOARD
**CERTIFICATE OF PARTICIPATION IN WORKERS' COMPENSATION
GROUP SELF-INSURANCE**

1a. Legal Name and Address of Business Participating in Group Self-Insurance (Use Street Address Only)	1d. Business Telephone Number of Business referenced in box "1a" 1e. NYS Unemployment Insurance Employer Registration Number of Business referenced in box "1a"
1b. Effective Date of Membership in the Group	1f. Federal Employer Identification Number of Business referenced in box "1a"
1c. The Proprietor, Partners or Executive Officers are <input type="checkbox"/> included (Only check box if all partners/officers included) <input checked="" type="checkbox"/> included all excluded or certain partners/officers excluded	3. Name and Address of Group Self-Insurer
2. Name and Address of the Entity Requesting Proof of Coverage (Entity Being Listed as Certificate Holder)	3. Name and Address of Group Self-Insurer

This certifies that the business referenced above in box "1a" is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law as a participating member of the Group Self-Insurer listed above in box "3" and participation in such group self-insurance is still in force. The Group Self-Insurer's Administrator will send this Certificate of Participation to the entity listed above as the certificate holder in box "2".

The Group Self-Insurer's Administrator will notify the above certificate holder within 10 days IF the membership of the participant listed in box "1a" is terminated. (These notices may be sent by regular mail.) Otherwise, this Certificate is valid for a maximum of one year from the date certified by the group self-insurer.

If this certificate is no longer valid according to the above guidelines and the business referenced in box "1a" continues to be named on a permit, license or contract issued by the certificate holder, the business must provide the certificate holder either with a new certificate or other authorized proof the business is complying with the mandatory coverage requirements of the New York State Workers' Compensation Law.

Under penalty of perjury, I certify that I am an authorized representative of the Group Self-Insurer referenced above and that the business referenced in box "1a" has the coverage as depicted on this form.

Certified by: _____
(Print name of authorized representative of the Group Self-Insurer)

Certified by: _____
(Signature) (Date)

Title: _____

Telephone Number: _____

STATE OF NEW YORK
WORKERS' COMPENSATION BOARD

CERTIFICATE OF INSURANCE COVERAGE UNDER THE NYS DISABILITY BENEFITS LAW

PART 1. To be completed by Disability Benefits Carrier or Licensed Insurance Agent of that Carrier

<p>1a. Legal Name and Address of Insured (Use street address only)</p>	<p>1b. Business Telephone Number of Insured</p> <p>1c. NYS Unemployment Insurance Employer Registration Number of Insured</p> <p>1d. Federal Employer Identification Number of Insured or Social Security Number</p>
<p>2. Name and Address of the Entity Requesting Proof of Coverage (Entity Being Listed as the Certificate Holder)</p> <p>State University of New York Room 302 1400 Washington Avenue Albany, NY 12222</p>	<p>3a. Name of Insurance Carrier</p> <p>3b. Policy Number of entity listed in box "1a":</p> <p>3c. Policy effective period: _____ to _____</p>

4. Policy covers:

a. All of the employer's employees eligible under the New York Disability Benefits Law

b. Only the following class or classes of the employer's employees:

Under penalty of perjury, I certify that I am an authorized representative or licensed agent of the insurance carrier referenced above and that the named insured has NYS Disability Benefits insurance coverage as described above.

Date Signed _____ By _____
(Signature of insurance carrier's authorized representative or NYS Licensed Insurance Agent of that insurance carrier)

Telephone Number _____ Title _____

IMPORTANT: If box "4a" is checked, and this form is signed by the insurance carrier's authorized representative or NYS Licensed Insurance Agent of that carrier, this certificate is COMPLETE. Mail it directly to the certificate holder.
If box "4b" is checked, this certificate is NOT COMPLETE for purposes of Section 220, Subd. 8 of the Disability Benefits Law. It must be mailed for completion to the Workers' Compensation Board, DB Plans Acceptance Unit, 20 Park Street, Albany, New York 12207.

PART 2. To be completed by NYS Workers' Compensation Board (Only if box "4b" of Part I has been checked)

**State Of New York
Workers' Compensation Board**

According to information maintained by the NYS Workers' Compensation Board, the above-named employer has complied with the NYS Disability Benefits Law with respect to all of his/her employees.

Date Signed _____ By _____
(Signature of NYS Workers' Compensation Board Employee)

Telephone Number _____ Title _____

Please Note: Only insurance carriers licensed to write NYS disability benefits insurance policies and NYS licensed insurance agents of those insurance carriers are authorized to issue Form DB-120.1. Insurance brokers are NOT authorized to issue this form.

FORM DB-155



STATE OF NEW YORK
WORKERS' COMPENSATION BOARD
SELF-INSURANCE OFFICE
20 PARK STREET - ROOM 206
ALBANY, NY 12207



(518) 402-0247
FAX (518) 402-6199

COMPLIANCE WITH DISABILITY BENEFITS LAW:
(Pursuant To Section 220, subd. 8 of the Disability Benefits Law)

EMPLOYER	FEDERAL EMPLOYER IDENTIFICATION NUMBER
	LOCATION OF OPERATION
ADDRESS (HOME OR MAIN OFFICE)	OPERATIONS TO BE INSURED OR ABOUT:

There are on file with the Workers' Compensation Board, documents indicating that the above-named employer has complied with the Disability Benefits Law with respect to all of his or her employees in the following manner:

- By approved self-insurance pursuant to Section 211, subdivision 3 of the Disability Benefits Law.
- By a combination of approved self-insurance pursuant to Section 211, subdivision 3 of the Disability Benefits Law and insurance with authorized insurance carrier(s).

Date:

By: _____
Gina Wagoner
WC Examiner

DB-155 (3/04)

THIS AGENCY EMPLOYS & SERVES PEOPLE WITH DISABILITIES WITHOUT DISCRIMINATION

Affidavit of Exemption to Show Specific Proof of Workers' Compensation Insurance Coverage for a 1, 2, 3 or 4 Family, Owner-occupied Residence

****This form cannot be used to waive the workers' compensation rights or obligations of any party.****

Under penalty of perjury, I certify that I am the owner of the 1, 2, 3 or 4 family, **owner-occupied** residence (including condominiums) listed on the building permit that I am applying for, and I am not required to show specific proof of workers' compensation insurance coverage for such residence because (please check the appropriate box):

- I am performing all the work for which the building permit was issued.
- I am not hiring, paying or compensating in any way, the individual(s) that is(are) performing all the work for which the building permit was issued or helping me perform such work.
- I have a homeowners insurance policy that is currently in effect and covers the property listed on the attached building permit AND am hiring or paying individuals a total of less than 40 hours per week (aggregate hours for all paid individuals on the jobsite) for which the building permit was issued.

I also agree to either:

- ◆ acquire appropriate workers' compensation coverage and provide appropriate proof of that coverage on forms approved by the Chair of the NYS Workers' Compensation Board to the government entity issuing the building permit if I need to hire or pay individuals a total of 40 hours or more per week (aggregate hours for all paid individuals on the jobsite) for work indicated on the building permit, or if appropriate, file a CE-200 exemption form; OR
- ◆ have the general contractor, performing the work on the 1, 2, 3 or 4 family, **owner-occupied** residence (including condominiums) listed on the building permit that I am applying for, provide appropriate proof of workers' compensation coverage or proof of exemption from that coverage on forms approved by the Chair of the NYS Workers' Compensation Board to the government entity issuing the building permit if the project takes a total of 40 hours or more per week (aggregate hours for all paid individuals on the jobsite) for work indicated on the building permit.

(Signature of Homeowner)

(Date Signed)

(Homeowner's Name Printed)

Home Telephone Number _____

Property Address that requires the building permit:

<p><i>Sworn to before me this _____ day of</i> _____, _____.</p> <p>_____ <i>(County Clerk or Notary Public)</i></p>
--

Once notarized, this BP-1 form serves as an exemption for both workers' compensation and disability benefits insurance coverage.

LAWS OF NEW YORK, 1998
CHAPTER 439

The general municipal law is amended by adding a new section 125 to read as follows:

125. ISSUANCE OF BUILDING PERMITS. NO CITY, TOWN OR VILLAGE SHALL ISSUE A BUILDING PERMIT WITHOUT OBTAINING FROM THE PERMIT APPLICANT EITHER:

1. PROOF DULY SUBSCRIBED THAT WORKERS' COMPENSATION INSURANCE AND DISABILITY BENEFITS COVERAGE ISSUED BY AN INSURANCE CARRIER IN A FORM SATISFACTORY TO THE CHAIR OF THE WORKERS' COMPENSATION BOARD AS PROVIDED FOR IN SECTION FIFTY-SEVEN OF THE WORKERS' COMPENSATION LAW IS EFFECTIVE; OR

2. AN AFFIDAVIT THAT SUCH PERMIT APPLICANT HAS NOT ENGAGED AN EMPLOYER OR ANY EMPLOYEES AS THOSE TERMS ARE DEFINED IN SECTION TWO OF THE WORKERS' COMPENSATION LAW TO PERFORM WORK RELATING TO SUCH BUILDING PERMIT.

Implementing Section 125 of the General Municipal Law

1. General Contractors -- Business Owners and Certain Homeowners

For **businesses and certain homeowners listed as the general contractors on building permits**, proof that they are in compliance with Section 57 of the Workers' Compensation Law (WCL) is **ONE** of the following forms that indicate that they are:

- ◆ insured (C-105.2 or U-26.3),
- ◆ self-insured (SI-12), or
- ◆ are exempt (CE-200),

under the mandatory coverage provisions of the WCL. Any residence that is not a **1, 2, 3 or 4 Family, Owner-occupied Residence** is considered a business (income or potential income property) and must prove compliance by filing one of the above forms.

2. Owner-occupied Residences

For homeowners of a **1, 2, 3 or 4 Family, Owner-occupied Residence**, proof of their exemption from the mandatory coverage provisions of the Workers' Compensation Law when applying for a building permit is to file form BP-1.

- ◆ Form BP-1 shall be filed if the homeowner of a **1, 2, 3 or 4 Family, Owner-occupied Residence** is listed as the general contractor on the building permit, and the homeowner:
 - ◇ is performing all the work for which the building permit was issued him/herself,
 - ◇ is not hiring, paying or compensating in any way, the individual(s) that is(are) performing all the work for which the building permit was issued or helping the homeowner perform such work, or
 - ◇ has a homeowner's insurance policy that is currently in effect and covers the property for which the building permit was issued AND the homeowner is hiring or paying individuals a total of less than 40 hours per week (aggregate hours for all paid individuals on the jobsite) for the work for which the building permit was issued.
- ◆ If the homeowner of a **1, 2, 3 or 4 Family, Owner-occupied Residence** is hiring or paying individuals a total of **40 hours or MORE** in any week (aggregate hours for all paid individuals on the jobsite) for the work for which the building permit was issued, then the homeowner may not file the "Affidavit of Exemption" form, BP-1(11/04), but shall either:
 - ◇ acquire appropriate workers' compensation coverage and provide appropriate proof of that coverage on forms approved by the Chair of the NYS Workers' Compensation Board to the government entity issuing the building permit (the C-105.2 or U-26.3 form), OR
 - ◇ have the general contractor, (performing the work on the 1, 2, 3 or 4 family, **owner-occupied** residence (including condominiums) listed on the building permit) provide appropriate proof of workers' compensation coverage, or proof of exemption from that coverage on forms approved by the Chair of the NYS Workers' Compensation Board to the government entity issuing the building permit.

STATE OF NEW YORK - WORKERS' COMPENSATION BOARD
ESTADO DE NUEVA YORK - JUNTA DE COMPENSACION OBRERA
NOTICE OF COMPLIANCE
WORKERS' COMPENSATION LAW

AVISO DE CUMPLIMIENTO
LEY DE COMPENSACION OBRERA

TO EMPLOYEES

A EMPLEADOS

IMPORTANT INFORMATION FOR EMPLOYEES WHO ARE INJURED OR SUFFER AN OCCUPATIONAL DISEASE WHILE WORKING.

INFORMACION IMPORTANTE PARA EMPLEADOS QUE SEAN LESIONADOS O SUFRAN UNA ENFERMEDAD OCUPACIONAL MIENTRAS TRABAJAN.

1. By posting this notice and information concerning your rights as an injured worker, your compliance with the Workers' Compensation Law.
2. If you do not notify your employer within 30 days of the date of your injury your claim may be disallowed, so do so immediately.
3. You are entitled to obtain any necessary medical treatment and should do so immediately.
4. You may choose any doctor, podiatrist, chiropractor or psychologist referred by a medical doctor that accepts NY State Workers Compensation patients and is Board authorized. However, if your employer is involved in a certified preferred provider organization (PPO) you must first be treated by a provider chosen by your employer and your employer must give you a written statement of your rights concerning further medical care.
5. You should tell your doctor to file copies of medical reports concerning your claim with the Workers' Compensation Board and with your employer's insurance company, which is indicated at the bottom of this form.
6. You may be entitled to lost time benefits if your work-related injury keeps you from work for more than seven days, compels you to work at lower wages or results in permanent disability to any part of your body. You may be entitled to rehabilitation services if you need help returning to work.
7. You should not pay any medical providers directly. They should send their bills to your employers insurance carrier. If there is a dispute, the provider must wait until the Board makes a decision before it attempts to collect payment from you. If you do not pursue your claim or the Board rules that your injury is not work-related, you may be responsible for the payment of the bills.
8. You are entitled to be represented by an attorney or licensed representative, but it is not required. If you do hire a representative do not pay him/her directly. Any fee will be set by the Board and will be deducted from your award.
9. If you have difficulty in obtaining a claim form or need help in filling it out, or if you have any other questions or problems about a job-related injury, contact any office of the Workers' Compensation Board.

NOT A CONTRACT

WORKERS' COMPENSATION BOARD OFFICES

- Albany, 12241 - 100 Broadway-Menands - (866) 750-5157
- Brooklyn, 11201 - Ill Livingston St. - Brooklyn - (800) 877-1373
- Binghamton, 113901 - State Office Bldg. - 44 Hawley St. - (866) 802-3604
- Buffalo, 14202 - Stalter Tower, 107 Delaware Ave. - (866) 211-0645
- Hauppauge, 11788 - 220 Rabro Drive - Suite 1C0 - (866) 681-5354
- *Hempstead, 11550 - 175 Fulton Avenue - (866) 805-3630
- New York, 10027 - 215 W. 1125th St., Manhattan - (800)-877-1373
- Peekskill, 10566 - 41 North Division St. (866) 746-0552
- Queens, 11432 - 168-46 91st Ave., Jamaica (800) 877-1373
- Rochester, 14614 - 130 Main Street West - (866) 211-0644
- Syracuse, 13203 - 935 James St. - (866) 802-3730

• DOWNSTATE MAIL ADDRESS

Claims-related mail for the Hauppauge, Hempstead, Peekskill and all NYC offices should be mailed to:
 PO Box 5205 Binghamton, NY 13902-5205

1. Su patrono esta cumpliendo la Ley de Compensacion Obrera cuando despliega este comunicado concerniente a sus derechos como trabajador lesionado.
2. Si usted no notifica a su patrono dentro del termino de 30 dias de haber sufrido su lesion su reclamacion podria ser desestimada, por eso notifique inmediatamente.
3. Usted tiene derecho a recibir cualquier tratamiento medico necesario relacionado con su lesion y debe gestionarlo inmediatamente.
4. Para el tratamiento de cualquier lesion o enfermedad relacionada con el trabajo usted puede escoger cualquier medico, podiatra, quiropractico o psicólogo (si es referido por un medico autorizado) que esta autorizado y acepte pacientes de la Junta de Compensacion Obrera. Sin embargo, si su patrono esta autorizado a participar en una organizacion certificada de proveedores preferidos (PPO), usted debera obtener tratamiento inicial para cualquier lesion o enfermedad relacionada con el trabajo de la correspondiente entidad. Patronos que participen en cualquiera de estos programas establecidos por ley estan obligados a proveer a sus empleados notificacion escrita explicando sus derechos y obligaciones bajo el programa que este acogido.
5. Usted debera pedir a su Medico que radique copias de los informes medicos de su caso en la Junta de Compensacion Obrera y en la compania de seguros de su patrono, que se indica al final de esta forma.
6. Usted tiene derecho a compensacion si su lesion relacionada con el trabajo le impide trabajar por mas de siete dias, le obliga a trabajar a sueldo mas bajo o resulta en incapacidad permanente de cualquier parte de su cuerpo. Usted puede tener derecho a servicios de rehabilitacion si necesita ayuda para regresar al trabajo.
7. No pague a ningun proveedor medico directamente por tratamiento de su lesion o enfermedad relacionada con el trabajo. Ellos deben enviar sus facturas all asegurador de su patrono. Si el caso es cuestionado, el proveedor debera esperar hasta que la junta decida el caso, antes de iniciar gestion de cobro alguna contra usted. Si usted no tramita su caso o la Junta con el trabajo, usted podria ser responsable del pago de las facturas.
8. No es obligatorio el estar representado en ninguno de los procedimientos de la Junta, pero es un derecho que usted tiene, el estar representado por abogado o por representante licenciado si usted asi lo desea. Si es representado, no pague al abogado o al representante licenciado. Cuando la Junta decida su caso, los honorarios seran determinados por la Junta y descontados de sus beneficios.
9. Si tiene dificultad en conseguir un formulario de reclamacion o necesita ayuda para llenarlo o tiene dudas sobre cualquier situacion relacionada con una lesion o enfermedad comuniquese con la oficina mas cercana de la Junta.


 ARY S. WEISS CHAIR/PRESIDENT ZACH

Workers' Compensation benefits, when due, will be paid by

(Los beneficios de Compensacion Obrera, cuando debidos, seran pagados por):

SAMPLE

Effective From _____ To _____
 (En vigor Desde) (Hasta Cancellation)

Policy No. _____
 (Poliza No)

Name of employer (Nombre del patrono)

THIS NOTICE MUST BE POSTED CONSPICUOUSLY IN AND ABOUT THE EMPLOYER'S PLACE OR PLACES OF BUSINESS

C-105(4-09)
 S.I.F. U-30e
 "U30SIF/SN"

PRESCRIBED BY CHAIR
 WORKERS' COMPENSATION BOARD
 STATE OF NEW YORK www.wcb.state.ny.us

Failure by an employer to post this notice in and about the employer's place or places of business may result in a \$250 penalty for each violation.

NOTICE OF COMPLIANCE
DISABILITY BENEFITS LAW
TO EMPLOYEES

AVISO DE CUMPLIMIENTO
LEY DE BENEFICIOS POR INCAPACIDAD
A LOS EMPLEADOS

- If you are unable to work because of an illness or injury not work-related, you may be entitled to receive weekly benefits from your employer, or his or her insurance company, or from the Special Fund for Disability Benefits.
- To claim benefits You must file a claim form, within 30 days from the first date of your disability, but in no event more than 26 weeks from such date.
- Use one of the following claim forms:
-if, when your disability begins you are employed or are unemployed for four weeks or less, use WHITE claim form (Form DB-450), which you may obtain from your employer, his or her insurance carrier, your health provider or any office of the Workers' Compensation Board, and send it to your employer or the insurance carrier named below.
-If, when your disability begins, you have been unemployed more than four weeks, use the GREEN claim form (Form DB-300), which you may obtain from any Unemployment Insurance Office, your health provider, or any office of the Workers' Compensation Board. Send completed claim form to the Workers' Compensation Board, Disability Benefits Bureau Albany, New York 12241.
IMPORTANT Before filing your claim, your health provider must complete the "Health Care Provider's Statement" on the claim form, showing your period of disability.
- You are entitled to be treated by any physician, chiropractor, dentist, nurse-midwife, podiatrist or psychologist of your choice. However, unlike workers' compensation, your medical bills will not be paid unless your employer and/or union provide for the payment of such bills under a Disability Benefits Plan or Agreement.
- If you are ill or injured during the time you are receiving Unemployment Insurance Benefits, file a claim for Disability Benefits as soon as you sustain the injury or illness, by following the instructions outlined above.
- If you are out of work in excess of seven days, your employer is required to send you a Disability Benefits Statement of Rights (Form DB-271).
- Other information about Disability Benefits may be obtained by writing or calling the nearest Workers' Compensation Board Office.

- Si usted no puede trabajar debido a enfermedad o lesión no relacionada con el trabajo, podría tener derecho a recibir, beneficios semanales de su patrón o de la compañía de seguros de él/ella o del Fondo Especial para Beneficios por Incapacidad.
- Para reclamar beneficios usted debe Presentar una forma de reclamación, dentro de 30 días a Partir de la Primera fecha de su incapacidad, pero en ningún caso más de 26 semanas de dicha fecha.
- Use una de las siguientes formas de reclamación:
-Si, cuando comience su incapacidad usted está empleado o ha estado desempleado por cuatro semanas o menos, use la forma de reclamación BLANCA (form DB-450), la cual puede obtener de su patrón o de la compañía de seguros de él/ella, o de su proveedor de cuidados de salud, o bien de cualquier oficina de la Junta de Compensación Obrera, y envíela a su patrón o a la compañía de seguros nombrada abajo.
-Si, cuando comience su incapacidad, usted ha estado desempleado más de cuatro semanas, use la forma de reclamación VERDE (form DB-300), la cual puede obtener en cualquier Oficina de Seguro de Desempleo, de su proveedor de salud, o bien de cualquier oficina de la Junta de Compensación Obrera Envíe la forma de reclamación, debidamente terminada, a Workers' Compensation Board, Disability Benefits Bureau, Albany, New York 12241.
IMPORTANTE Antes de presentar usted su reclamación, es necesario que su proveedor de salud complete la declaración del médico ("Health Care Provider's Statement") en la forma de reclamación, indicando el periodo de su incapacidad.
- Usted tiene derecho a ser tratado por cualquier medico, quiropráctico, dentista, enfermera-partera, podiatra o psicologo que usted elija. Pero, con excepción a la compensación obrera, sus cuentas médicas no serán pagadas a menos que su patrón y/o Unión haga el pago de tales cuentas médicas bajo un Plan o Convenio de Beneficios por Incapacidad.
Si estuviera usted enfermo o lesionado durante el tiempo que esté recibiendo beneficios del Seguro de Desempleo, presente una reclamación para Beneficios por Incapacidad, siguiendo las instrucciones arriba descritas, tan pronto como sufra la lesión o la enfermedad.
Si usted está desempleado por más de siete días, su patrón está obligado a enviarle la declaración de Derechos de Beneficios por incapacidad (Form DB-271).
- Otras informaciones relativas a Beneficios por incapacidad pueden obtenerse escribiendo o llamando a la oficina mas cercana de la Junta de Compensación Obrera.

WORKERS' COMPENSATION BOARD OFFICE

Albany, 12241 -100 Broadway-Menands- (518) 474-6681
Binghamton, 13901 - State Office Bldg - 44 Hawley St. - (607) 721-8333
Buffalo, 14203-State Office Bldg -125 Main St - (716) 847-3171
Hempstead, 11550 -175 Fulton Avenue - (516) 560-7115
Rochester, 14614 - 130 Main Street West - (716) 233-6322
Syracuse, 13202 - State Office Bldg.-333 E. Washington St. - (315) 428-4465

Robert R. Snashall
Robert R. Snashall
Chairman (Presidente)

The undersigned employer is in compliance with the provisions of the Disability Benefits Law (El patrón abajo firmante esta en conformidad con las disposiciones de la ley de Beneficios por Incapacidad).
Disability Benefits, when due, will be paid by (Los Beneficios por Incapacidad, cuando debidos, serán pagados por):

The benefits provided are (Los beneficios provistos son)

<input type="checkbox"/>	Statutory (Estatutarios)	<input type="checkbox"/>	Under a Plan or Agreement (Bajo un Plan o Convenio)
--------------------------	-----------------------------	--------------------------	---

Class(es) of employees covered (Clasé(s) de empleados amparados)

ALL EMPLOYEES ELIGIBLE UNDER NY DBL

Name of employer (Nombre del Patrón)

SAMPLE

Effective: From (_____) To UNTIL CANCELLED
(En Vigor Desde) (HASTA)

Policy No _____
(Poliza No.)

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

LA JUNTA DE COMPENSACIÓN OBRERA EMPLEA Y SIRVE
A PERSONAS INCAPACITADAS SIN DISCRIMINAR.

By *W. J. J. J.*

**Erie County Water Authority
ACORD Endorsement Samples**

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS – (FORM B)**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART.

SCHEDULE

Name of Person or Organization:

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule, but only with respect to liability arising out of "your work" for that insured by or for you.

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – DESIGNATED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART.

SCHEDULE

Name of Person or Organization:

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

WHO IS AN INSURED (Section II) is amended to include as an insured the person or organization shown in the Schedule as an insured but only with respect to liability arising out of your operations or premises owned by or rented to you.

SAMPLE ISO FORM

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

POLLUTION LIABILITY – BROADENED COVERAGE FOR COVERED AUTOS – BUSINESS AUTO, MOTOR CARRIER AND TRUCKERS COVERAGE FORMS

This endorsement modifies insurance provided under the following:

BUSINESS AUTO COVERAGE FORM
MOTOR CARRIER COVERAGE FORM
TRUCKERS COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by the endorsement.

A. Liability Coverage is changed as follows:

1. Paragraph **a.** of the **Pollution Exclusion** applies only to liability assumed under a contract or agreement.
2. Exclusion **B.6.** Care, Custody Or Control does not apply.

B. Changes In Definitions

For the purposes of this endorsement, Paragraph **D.** of the **Definitions** Section is replaced by the following:

- D.** "Covered pollution cost or expense" means any cost or expense arising out of:
1. Any request, demand, order or statutory or regulatory requirement; or
 2. Any claim or "suit" by or on behalf of a governmental authority demanding

that the "insured" or others test for, monitor, clean up, remove, contain, treat, detoxify or neutralize, or in any way respond to, or assess the effects of "pollutants".

"Covered pollution cost or expense" does not include any cost or expense arising out of the actual, alleged or threatened discharge, dispersal, seepage, migration, release or escape of "pollutants":

- a.** Before the "pollutants" or any property in which the "pollutants" are contained are moved from the place where they are accepted by the "insured" for movement into or onto the covered "auto"; or

- b.** After the "pollutants" or any property in which the "pollutants" are contained are moved from the covered "auto" to the place where they are finally delivered, disposed of or abandoned by the "insured".

Paragraphs **a.** and **b.** above do not apply to "accidents" that occur away from premises owned by or rented to an "insured" with respect to "pollutants" not in or upon a covered "auto" if:

- (1) The "pollutants" or any property in which the "pollutants" are contained are upset, overturned or damaged as a result of the maintenance or use of a covered "auto"; and
- (2) The discharge, dispersal, seepage, migration, release or escape of the "pollutants" is caused directly by such upset, overturn or damage.

ENDORSEMENT FOR
MOTOR CARRIER POLICIES OF INSURANCE FOR PUBLIC LIABILITY
UNDER SECTIONS 29 and 30 OF THE MOTOR CARRIER ACT OF 1980

Issued to

of

Dated at

This _____ day of _____

Amending Policy No. _____ Effective Date _____

Telephone Number _____ Countersigned by _____

Authorized Company Representative

Name of Insurance Company _____

The policy to which this endorsement is attached provides primary or excess insurance, as indicated by

", for the limits shown:

This insurance is primary and the company shall not be liable for amounts in excess of \$ _____ for each accident.

This insurance is excess and the company shall not be liable for amounts in excess of \$ _____ for each accident in excess of the underlying limit of \$ _____ for each accident.

Whenever required by the Federal Motor Carrier Safety Administration (FMCSA), the company agrees to furnish the FMCSA a duplicate of said policy and all its endorsements. The company also agrees, upon telephone request by an authorized representative of the FMCSA, to verify that the policy is in force as of a particular date. The telephone number to call is:

Cancellation of this endorsement may be effected by the company or the insured by giving (1) thirty-five (35) days notice in writing to the other party (said 35 days notice to commence from the date the notice is mailed, proof of mailing shall be sufficient proof of notice), and (2) if the insured is subject to the FMCSA's registration requirements under 49 U.S.C. 13901, by providing thirty (30) days notice to the FMCSA (said 30 days notice to commence from the date the notice is received by the FMCSA at its office in Washington, D.C.).

DEFINITIONS AS USED IN THIS ENDORSEMENT

ACCIDENT includes continuous or repeated exposure to conditions which results in bodily injury, property damage, or environmental damage which the insured neither expected nor intended.

MOTOR VEHICLE means a land vehicle, machine, truck, tractor, trailer, or semitrailer propelled or drawn by mechanical power and used on a highway for transporting property, or any combination thereof.

BODILY INJURY means injury to the body, sickness, or disease to any person, including death resulting from any of these.

PROPERTY DAMAGE means damage to or loss of use of tangible property.

ENVIRONMENTAL RESTORATION means restitution for the loss, damage, or destruction of natural resources arising out of the accidental discharge, dispersal, release or escape into or upon the land, atmosphere, watercourse, or body of water, of any commodity transported by a motor carrier. This shall include the cost of removal and the cost of necessary measures taken to minimize or mitigate damage to human health, the natural environment, fish, shellfish, and wildlife.

PUBLIC LIABILITY means liability for bodily injury, property damage, and environmental restoration.

**ENDORSEMENT FOR
MOTOR CARRIER POLICIES OF INSURANCE FOR PUBLIC LIABILITY
UNDER SECTIONS 29 and 30 OF THE MOTOR CARRIER ACT OF 1980**

The insurance policy to which this endorsement is attached provides automobile liability insurance and is amended to assure compliance by the insured, within the limits stated herein, as a motor carrier of property, with Sections 29 and 30 of the Motor Carrier Act of 1980 and the rules and regulations of the Federal Motor Carrier Safety Administration (FMCSA).

In consideration of the premium stated in the policy to which this endorsement is attached, the insurer (the company) agrees to pay, within the limits of liability described herein, any final judgment recovered against the insured for public liability resulting from negligence in the operation, maintenance or use of motor vehicles subject to the financial responsibility requirements of Sections 29 and 30 of the Motor Carrier Act of 1980 regardless of whether or not each motor vehicle is specifically described in the policy and whether or not such negligence occurs on any route or in any territory authorized to be served by the insured or elsewhere. Such insurance as is afforded, for public liability, does not apply to injury to or death of the insured's employees while engaged in the course of their employment, or property transported by the insured, designated as cargo.

It is understood and agreed that no condition, provision, stipulation, or limitation contained in the policy, this endorsement, or any other endorsement thereon, or violation thereof, shall relieve the company from liability or from the payment of any final judgment, within the limits of liability herein described, irrespective of the financial condition, insolvency or bankruptcy of the insured. However, all terms, conditions, and limitations in the policy to which the endorsement is attached shall remain in full force and effect as binding between the insured and the company. The insured agrees to reimburse the company for any payment made by the company on account of any accident, claim, or suit involving a breach of the terms of the policy, and for any payment that the company would not have been obligated to make under the provisions of the policy except for the agreement contained in this endorsement.

It is further understood and agreed that, upon failure of the company to pay any final judgment recovered against the insured as provided herein, the judgment creditor may maintain an action in any court of competent jurisdiction against the company to compel such payment.

The limits of the company's liability for the amounts prescribed in this endorsement apply separately, to each accident, and any payment under the policy because of any one accident shall not operate to reduce the liability of the company for the payment of final judgments resulting from any other accident.

THE SCHEDULE OF LIMITS SHOWN ON THE NEXT PAGE DOES NOT PROVIDE COVERAGE.

The limits shown in the schedule are for information purposes only.

**ENDORSEMENT FOR
MOTOR CARRIER POLICIES OF INSURANCE FOR PUBLIC LIABILITY
UNDER SECTIONS 29 and 30 OF THE MOTOR CARRIER ACT OF 1980**

**SCHEDULE OF LIMITS
Public Liability**

	Type of Carriage	Commodity Transported	Minimum Insurance
(1)	For-hire (In interstate or foreign commerce).	Property (nonhazardous).	\$ 750,000
(2)	For-hire and Private (In interstate, foreign, or intrastate commerce, with a gross vehicle weight rating of 10,000 or more pounds).	Hazardous substances, as defined in 49 CFR 171.8, transported in cargo tanks, portable tanks, or hopper-type vehicles with capacities in excess of 3,500 water gallons; or in bulk Division 1.1, 1.2, and 1.3 materials; any quantity of Division 2.3, Hazard Zone A, or Division 6.1, Packing Group I, Hazard Zone A material; in bulk Division 2.1 or 2.2; or highway route controlled quantities of a Class 7 material as defined in 49 CFR 173.403.	5,000,000
(3)	For-hire and Private (In interstate or foreign commerce, in any quantity; or in intrastate commerce, in bulk only; with a gross vehicle weight rating of 10,000 or more pounds).	Oil listed in 49 CFR 172.101; hazardous materials and hazardous substances defined in 49 CFR 171.8 and listed in 49 CFR 172.101, but not mentioned in (2) above or (4) below.	1,000,000
(4)	For-hire and Private (In interstate or foreign commerce, with a gross vehicle weight rating of less than 10,000 pounds).	Any quantity of Division 1.1, 1.2, or 1.3 material; any quantity of a Division 2.3, Hazard Zone A, or Division 6.1, Packing Group I, Hazard Zone A material; or highway route controlled quantities of a Class 7 material as defined in 49 CFR 173.403.	5,000,000

APPENDIX C

PREVAILING WAGE RATE SCHEDULE



Andrew M. Cuomo, Governor

Mario J. Musolino, Acting, Commissioner

Erie County Water Authority
Michael Chirico, Corporate Associate
Nussbaumer & Clarke, Inc.
3556 Lake Shore Road
Suite 500
Buffalo NY 14219

Schedule Year 2015 through 2016
Date Requested 06/03/2016
PRC# 2016005413

Location Sturgeon Point
Project ID# 15j1-0035
Project Type Sturgeon Point Raw Water Pump Station Improvements Contract No. NC-34

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 2015 through June 2016. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.state.ny.us. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

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

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

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

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

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

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

Introduction

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

Responsibilities of the Department of Jurisdiction

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

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

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

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

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

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

There are very few exceptions to this rule. Complete information regarding these exceptions is available on the "4 Day / 10 Hour Work Schedule" form (PW 30R).

Wages and Supplements

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

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.state.ny.us.

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.state.ny.us.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. Payrolls must be maintained for at least three (3) years from the project's date of completion. 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.

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.

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

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

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

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

Interest and Penalties

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

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

Debarment

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

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

Criminal Sanctions

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

Discrimination

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

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

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

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

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

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

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

Workers' Compensation

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

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

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

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

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

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

Unemployment Insurance

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



Andrew M. Cuomo, Governor

Mario J. Musolino, Acting, Commissioner

Erie County Water Authority
Michael Chirico, Corporate Associate
Nussbaumer & Clarke, Inc.
3556 Lake Shore Road
Suite 500
Buffalo NY 14219

Schedule Year 2015 through 2016
Date Requested 06/03/2016
PRC# 2016005413

Location Sturgeon Point
Project ID# 15j1-0035
Project Type Sturgeon Point Raw Water Pump Station Improvements Contract No. NC-34

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: \$ _____	Contract Type:	
Approximate Starting Date: ____/____/____	<input type="checkbox"/> (01) General Construction	
Approximate Completion Date: ____/____/____	<input type="checkbox"/> (02) Heating/Ventilation	
	<input type="checkbox"/> (03) Electrical	
	<input type="checkbox"/> (04) Plumbing	
	<input type="checkbox"/> (05) Other : _____	

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

IMPORTANT NOTICE

FOR

CONTRACTORS & CONTRACTING AGENCIES

Social Security Numbers on Certified Payrolls

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

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

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

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

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

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

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

2. Background and Statutory References:

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

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

3. Procedures and Agency Responsibilities:

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

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

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

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

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

Reports should contain the following information:

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

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

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

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

Construction Industry Fair Play Act

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

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

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

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

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



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

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

The law says that you are an employee unless:

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

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

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

Employee rights. If you are an employee:

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

Independent Contractors: If you are an independent contractor:

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

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

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

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

Employer Name:

WORKER NOTIFICATION

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

Effective February 24, 2008

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

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



New York State Department of Labor
Bureau of Public Work

Attention Employees

THIS IS A: **PUBLIC WORK PROJECT**

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

Chapter 629 of the Labor Laws of 2007:

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

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

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 775-3568	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: _____

OSHA 10-hour Construction Safety and Health Course – S1537-A

Effective July 18, 2008

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

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

Where to find OSHA 10-hour Construction Course

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

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

2. OSHA Training Institute Education Centers:

Rochester Institute of Technology OSHA Education Center

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

Atlantic OSHA Training Center

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

Atlantic OSHA Training Center

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

Keene State College

Manchester, NH
Leslie Singleton
e-mail: lsingletin@keene.edu
(800) 449-6742
www.keene.edu/courses/print/courses_oshafcfm

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

www.OutreachTrainers.org

Requirements for OSHA 10 Compliance

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

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

The Bureau will enforce the statute as follows:

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

Proof of completion may include but is not limited to:

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

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

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

WICKS Reform 2008

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

- Raises the threshold for public work projects subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work. The total project's threshold would increase from \$50,000 to: \$3 million in Bronx, Kings, New York, Queens and Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.
- For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical work and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or use of a Project Labor Agreement (PLA), and must be open to public inspection.
- Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.
- The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.
- Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.
- Reduces from 15 to 7 days the period in which contractors must pay subcontractors.

IMPORTANT INFORMATION

Regarding Use of Form PW30R

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

To use the ‘4 Day / 10 Hour Work Schedule’:

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

AND

You **MUST** register your intent to work 4 / 10 hour days, by completing the PW30R Form.

REMEMBER...

The ‘4 Day / 10 Hour Work Schedule’ applies **ONLY** to Job Classifications and Counties listed on the PW30R Form.

Do not write in any additional Classifications or Counties.

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

Instructions for Completing Form PW30R

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

Before completing Form PW30R check to be sure ...

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

Instructions (Type or Print legibly):

Contractor Information:

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

Project Information:

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

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

Requestor Information:

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

Return Completed Form:

- **Mail** the completed PW30R form (3 pages) to: NYSDOL Bureau of Public Work, SOBC – Bldg.12 – Rm.130, Albany, NY 12240 **-OR-**
- **Fax** the completed PW30R form (3 pages) to: NYSDOL Bureau of Public Work at (518)485-1870



New York State Department of Labor
Bureau of Public Work
 W. Averell Harriman State Office Campus
 Building 12 - Room 130
 Albany, New York 12240
 Phone - (518) 457-5589 Fax - (518) 485-1870

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

Before completing Form PW30R check to be sure ...
 There is a *Dispensation of Hours* in place on the project.
 The 4 Day / 10 Hour Work Schedule applies to the Job Classifications you will be using.
 The 4 Day / 10 Hour Work Schedule applies to the County / Counties where the work will take place.

Please Type or Print the Requested Information

When completed ...
 Mail to NYSDOL Bureau of Public Work, SOBC, Bldg. 12, Rm.130, Albany, NY 12240
 -or-
 Fax to NYSDOL Bureau of Public Work at (518) 485-1870

Contractor Information

Company Name: _____ FEIN: _____
 Address: _____
 City: _____ State: _____ Zip Code: _____
 Phone Number _____ Fax Number: _____ Email Address: _____
 Contact Person: _____
 Phone No: _____ Fax No: _____ Email: _____

Project Information

Project PRC#: _____ Project Name/Type: _____
 Exact Location of Project: _____ County: _____
 (If you are Subcontractor)
 Prime Contractor Name: _____
 Job Classification(s) to Work 4/10 Schedule: *(Choose all that apply on Job Classification Checklist - Pages 2 & 3)*
 *** Do not write in any additional Classifications or Counties***

Requestor Information

Name: _____
 Title: _____ Date : _____

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

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

Job Classification Checklist

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

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

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

Job Classification Checklist

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

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

Job Classification	Tag #	Entire Counties	Partial Counties	Check Box
Electrician	86	26, 28	19, 35, 37, 59, 61	<input type="checkbox"/>
Electrician	840Teledata and 840 Z1	62	6, 34, 35, 50, 59	<input type="checkbox"/>
Electrician	910	10, 16, 17, 23, 25, 45		<input type="checkbox"/>
Electrician Lineman	1049Line/Gas	30, 41, 52		<input type="checkbox"/>
Electrician Lineman	1249a	1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 44, 46, 47, 48, 49, 50, 45, 51, 53, 54, 55, 56, 57, 58, 59, 61, 62		<input type="checkbox"/>
Electrical Lineman	1249a West	60		<input type="checkbox"/>
Electrical Lineman	1249a-LT	1, 2, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 32, 33, 34, 35, 37, 38, 39, 42, 46, 47, 48, 49, 50, 45, 51, 53, 54, 55, 57, 58, 59, 61, 62		<input type="checkbox"/>
Electrical Lineman	1249aREG8LT	11, 14, 36, 40, 44, 56		<input type="checkbox"/>
Electrical Lineman	1249aWestLT	60		<input type="checkbox"/>
Elevator Constructor	138	11, 14, 20, 36, 40, 53, 56	13, 44, 60	<input type="checkbox"/>
Elevator Constructor	14	2, 5, 7, 15, 19, 32, 37, 61		<input type="checkbox"/>
Elevator Constructor	27	8, 26, 28, 35, 49, 50, 51, 59, 62		<input type="checkbox"/>
Elevator Constructor	35	1, 10, 16, 18, 21, 22, 29, 39, 42, 46, 47, 48, 57, 58		<input type="checkbox"/>
Elevator Constructor	62.1	4, 6, 9, 12, 23, 25, 27, 33, 34, 38, 45, 54, 55	13	<input type="checkbox"/>
Glazier	201	1, 10, 11, 16, 17, 18, 20, 21, 29, 42, 46, 47, 48, 57, 58		<input type="checkbox"/>
Glazier	660r	2, 5, 7, 15, 19, 32, 37, 61		<input type="checkbox"/>
Glazier	660	2, 5, 7, 15, 19, 32, 37, 61		<input type="checkbox"/>
Glazier	677.1	23, 25, 26, 28, 35, 45, 50, 59, 62		<input type="checkbox"/>
Glazier	677Z-2	6, 12, 22, 27, 33, 34, 38		<input type="checkbox"/>
Glazier	677z3	4, 8, 9, 13, 39, 49, 51, 54, 55		<input type="checkbox"/>
Glazier	677r.2	6, 12, 22, 27, 33, 34, 38		<input type="checkbox"/>
Insulator - Heat & Frost	30-Syracuse	4, 6, 8, 9, 12, 22, 23, 25, 27, 33, 34, 38, 39, 49, 50, 45, 54, 55		<input type="checkbox"/>
Laborers - Building	322-2H	17, 23, 25, 45		<input type="checkbox"/>
Laborers - Building	785(7)	4	9, 13, 54	<input type="checkbox"/>

Job Classification Checklist

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

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

Job Classification	Tag #	Entire Counties	Partial Counties	Check Box
Laborers - Building	785B-CS	8, 51	49	<input type="checkbox"/>
Laborers- Heavy & Highway	322/2h	17, 23, 25, 45		<input type="checkbox"/>
Laborers- Heavy & Highway	7-785b	12, 55	49, 54	<input type="checkbox"/>
Laborers Heavy & Highway	785(7)	4	9, 13, 54	<input type="checkbox"/>
Laborer - Heavy & Highway	785HH-CS	8, 51	49	<input type="checkbox"/>
Laborer - Building	621b	2, 7	5	<input type="checkbox"/>
Laborer - Residential	621r	2, 7	5	<input type="checkbox"/>
Mason-Building	2TS.1	1, 10,11, 16, 17, 18, 20, 21, 29, 42, 46, 47, 48, 57, 58		<input type="checkbox"/>
Mason-Building	2TS.2	22, 23, 25, 33, 45	27	<input type="checkbox"/>
Mason-Building	2TS.3	6, 34, 38	27	<input type="checkbox"/>
Mason-Building	2b-on	34		<input type="checkbox"/>
Mason-Building	2b.1	1, 11, 18, 20, 21, 29, 42, 46, 47, 48, 58	57	<input type="checkbox"/>
Mason-Building	2b.2	22, 33	25	<input type="checkbox"/>
Mason-Building	2b.3	6, 34	27	<input type="checkbox"/>
Mason-Building	2b.4	38		<input type="checkbox"/>
Mason-Building	2b.5	23	25	<input type="checkbox"/>
Mason-Building	2b.6	45		<input type="checkbox"/>
Mason-Building	2b.8	10, 16, 17	57	<input type="checkbox"/>
Mason-Building	3b-Co-Z2	8, 49, 51	2	<input type="checkbox"/>
Mason-Building	3B-Z1	19, 26, 28, 35, 50, 59, 61, 62		<input type="checkbox"/>
Mason-Building-Residential	3B-Z1R	19, 26, 28, 35, 50, 59, 61, 62		<input type="checkbox"/>
Mason-Building	3B-Bing-Z2	4, 9, 13, 39, 54		<input type="checkbox"/>
Mason-Building	3B-lth-Z2	12, 55		<input type="checkbox"/>
Mason-Building	3B-Jam-Z2	7	2, 5	<input type="checkbox"/>
Mason-Building-Residential	3B-Jam-Z2R	2, 4, 8, 7, 9, 12, 39, 13, 49, 51, 54, 55	5	<input type="checkbox"/>
Mason-Building	3B-Z3	15, 32	5	<input type="checkbox"/>

Job Classification Checklist

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

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

Job Classification	Tag #	Entire Counties	Partial Counties	Check Box
Mason-Building	3B-Z3.Orleans	37		<input type="checkbox"/>
Mason-Residential	3B-Z3R	15, 32	5	<input type="checkbox"/>
Mason-Residential	3B-Z3R.Orleans	37		<input type="checkbox"/>
Mason-Heavy Highway	3h	2, 4, 8, 7, 9, 12, 13, 19, 26, 28, 35, 37, 39, 49, 50, 51, 54, 55, 59, 61, 62	5, 15, 32	<input type="checkbox"/>
Mason-Tile Finisher	3TF-Z1	19, 26, 28, 35, 50, 59, 61, 62		<input type="checkbox"/>
Mason-Tile Finisher	3TF-Z2	2, 4, 8, 7, 9, 12, 13, 39, 49, 51, 54, 55	5	<input type="checkbox"/>
Mason-Tile Finisher	3TF-Z3	15, 32, 37	5	<input type="checkbox"/>
Mason-Tile Finisher	3TF-Z1R	19, 26, 28, 35, 50, 59, 61, 62		<input type="checkbox"/>
Mason-Tile Finisher	3TF-Z2R	2, 4, 7, 9, 12, 13, 39, 49, 51, 54, 55	5	<input type="checkbox"/>
Mason-Tile Finisher	3TF-Z3R	15, 32, 37	5	<input type="checkbox"/>
Mason-Tile Setter	3TS-Z1	19, 26, 28, 35, 50, 59, 61, 62		<input type="checkbox"/>
Mason-Tile Setter Residential	3TS-Z1R	19, 26, 28, 35, 50, 59, 61, 62		<input type="checkbox"/>
Mason-Tile Setter	3TS-Z2	2, 4, 7, 8, 9, 12, 13, 39, 49, 51, 54, 55	5	<input type="checkbox"/>
Mason-Tile Setter Residential	3TS-Z2R	2, 4, 7, 8, 9, 12, 13, 39, 49, 51, 54, 55	5	<input type="checkbox"/>
Mason-Tile Setter Residential	3TS-Z3R	15, 32, 37	5	<input type="checkbox"/>
Mason - Building/Heavy&Highway	780	3, 24, 30, 31, 41, 43, 52		<input type="checkbox"/>
Operating Engineer - Heavy/Highway	137H/H	40, 60	14	<input type="checkbox"/>
Operating Engineer - Heavy& Highway	158-832H	2, 8, 26, 28, 35, 49, 51, 59, 62	19	<input type="checkbox"/>
Painter	1456-LS	1, 3, 10, 11, 14, 16, 17, 18, 20, 21, 24, 29, 30, 31, 36, 40, 41, 42, 43, 44, 46, 47, 48, 52, 53, 56, 57, 58, 60		<input type="checkbox"/>
Painter	150	28, 59, 62	26, 35	<input type="checkbox"/>
Painter	178 B	4, 9, 54		<input type="checkbox"/>
Painter	178 E	8, 49	51	<input type="checkbox"/>
Painter	178 I	12, 55		<input type="checkbox"/>
Painter	178 O	13, 39		<input type="checkbox"/>
Painter	31	6, 22, 27, 33, 34, 50	25, 35, 38	<input type="checkbox"/>

Job Classification Checklist

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

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

<i>Job Classification</i>	<i>Tag #</i>	<i>Entire Counties</i>	<i>Partial Counties</i>	<i>Check Box</i>
Painter	38.O		38	<input type="checkbox"/>
Painter	38.W	23, 45	25	<input type="checkbox"/>
Painter	4-Buf,Nia,Olean	2, 15, 19, 32, 37, 61	5, 7, 26, 51	<input type="checkbox"/>
Painter	4-Jamestown		5, 7	<input type="checkbox"/>
Painter	38.O		38	<input type="checkbox"/>
Painter	38.W	23, 45	25	<input type="checkbox"/>
Painter	4-Buf,Nia,Olean	2, 15, 19, 32, 37, 61	5, 7, 26, 51	<input type="checkbox"/>
Painter	4-Jamestown		5, 7	<input type="checkbox"/>
Sheetmetal Worker	46	26, 28, 35, 50, 59, 62		<input type="checkbox"/>
Sheetmetal Worker	46r	26, 28, 35, 50, 59, 62		<input type="checkbox"/>
Teamsters-Heavy&Highway	294h/h	1, 11, 18, 20, 29, 42, 46, 47, 48, 58	57	<input type="checkbox"/>
Teamsters-Heavy&Highway	317bhh	6, 12, 50, 51, 55, 62	2	<input type="checkbox"/>
Teamsters-Building/Heavy&Highway	456	40, 60		<input type="checkbox"/>

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.

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. In most cases the payment or provision of supplements is for each hour worked (noted in the schedule as 'Per hour worked'). Some classifications require the payment or provision of supplements for each hour paid (noted in the schedule as 'Per hour paid'), which require supplements to be paid or provided at a premium rate for premium hours worked. Some classifications may also require the payment or provision of supplements for paid holidays on which no work is performed.

Effective Dates

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

Apprentice Training Ratios

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

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

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

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg., H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3

Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

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

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

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

Erie County General Construction

Boilermaker **06/01/2016**

JOB DESCRIPTION Boilermaker

DISTRICT 12

ENTIRE COUNTIES

Allegany, Cattaraugus, Chautauqua, Chemung, Erie, Genesee, Livingston, Monroe, Niagara, Ontario, Orleans, Schuyler, Steuben, Wayne, Wyoming, Yates

WAGES

Per hour: 07/01/2015

Boilermaker \$ 31.50

The wage rate will be 90% of the above for Maintenance work on boilers less than 100,000 pph.

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

NOTE- In order to use the '4 Day/10 Hour Work Schedule, YOU MUST submit an Employer Registration for Use of 4 Day/10 Hour Work Schedule, Form PW30R; additionally, there must be a dispensation of hours in place on project.

SUPPLEMENTAL BENEFITS

Per hour: \$ 27.24*

*NOTE: \$26.00 of this amount is for every Hour "Paid"

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

1st Term 12 Months, Terms 3-8 at 6 Months

Per Hour:

1st	3rd	4th	5th	6th	7th	8th
\$21.48	\$23.05	\$24.63	\$26.20	27.78	\$28.35	\$29.93

Supplemental Benefits per hour:

1st to 6th	\$26.24**
7th to 8th	\$27.24***

**NOTE: \$25.00 of this amount is for every Hour "Paid"

***NOTE: \$26.00 of this amount is for every Hour "Paid"

12-7

Carpenter - Building **06/01/2016**

JOB DESCRIPTION Carpenter - Building

DISTRICT 12

ENTIRE COUNTIES

Erie

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour: 07/01/2015

Building:

Carpenter	\$ 31.80
FloorLayer	31.80
Certified Welder	32.80
Hazardous Waste Worker	33.30
Diver-Dry Day	32.80
Diver Tender	32.80
Diver-Wet Day***	61.25

Hazardous Waste Worker: Hazardous sites requiring personal protective equipment.

*** Diver rate applies to all hours worked on the day of dive.

Depth pay for divers:	0' to 80'	no additional fee
	81' to 100'	additional \$0.50 per foot
	101' to 150'	additional \$0.75 per foot
	151' and deeper	additional \$1.25 per foot
Penetration pay:	0' to 50'	no additional fee
	51' to 100'	additional \$0.75 per foot
	101' and deeper	additional \$1.00 per foot

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

NOTE - In order to use the '4 Day/10 Hour Work schedule' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked:

Carpenter(s)	\$ 27.13
Diver(s)	26.41

OVERTIME PAY

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

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's base wage:

1st	2nd	3rd	4th
50%	60%	70%	80%

Supplemental Benefits per hour worked:

1st	2nd	3rd	4th
\$10.40	\$10.40	\$13.00	\$13.00

12-276B-Cat

Carpenter - Building / Heavy&Highway **06/01/2016**

JOB DESCRIPTION Carpenter - Building / Heavy&Highway

DISTRICT 2

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Wyoming, Yates

PARTIAL COUNTIES

Orange: The area lying on Northern side of Orange County demarcated by a line drawn from the Bear Mountain Bridge continuing east to the Bear Mountain Circle, continue North on 9W to the town of Cornwall where County Road 107 (also known as Quaker Rd) crosses under 9W, then east on County Road 107 to Route 32, then north on Route 32 to Orrs Mills Rd, then west on Orrs Mills Rd to Route 94, continue west and south on Route 94 to the Town of Chester, to the intersection of Kings Highway, continue south on Kings Highway to Bellvale Rd, west on Bellvale Rd to Bellvale Lakes Rd, then south on Bellvale Lakes Rd to Kain Rd, southeast on Kain Rd to Route 17A, then north and southeast along Route 17A to Route 210, then follow Route 210 to NJ Border.

WAGES

Wages per hour: 07/01/2015

Carpenter - ONLY for Artificial Turf/Synthetic Sport Surface Installer	\$ 28.99
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Note - Does not include the operation of equipment. Please see Operating Engineers rates.

SUPPLEMENTAL BENEFITS

Per hour worked plus paid holidays:

Journeyman \$ 19.34

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (2, 17) on HOLIDAY PAGE
 Overtime: See (5, 6, 16) on HOLIDAY PAGE

Notes:

When a holiday falls upon a Saturday, it shall be observed on the preceding Friday. When a holiday falls upon a Sunday, it shall be observed on the following Monday.

An employee taking an unexcused day off the regularly scheduled day before or after a paid Holiday shall not receive Holiday pay.

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
50%	60%	70%	80%

Supplemental Benefits per hour paid:

	07/01/2015
1st year term	\$ 10.25
2nd year term	10.25
3rd year term	12.85
4th year term	12.85

2-42AtSS

Carpenter - Heavy&Highway 06/01/2016

JOB DESCRIPTION Carpenter - Heavy&Highway

DISTRICT 12

ENTIRE COUNTIES

Erie

WAGES

Per hour: 07/01/2015

Carpenter	\$ 33.09
Certified Welder	34.59
Diver-Dry Day	34.09
Diver-Wet Day**	58.09
Diver Tender	34.09
Hazardous Material Worker	35.09
Piledriver	33.09
Millwright	34.59
Effluent & Slurry Diver-Wet Day	87.13

Hazardous Waste Worker: Hazardous sites requiring personal protective equipment.

** Diver rate applies to all hours worked on the day of dive.

Depth pay for divers:	0' to 50'	no additional fee
	51'to 100'	additional \$0.50 per foot
	101' to 150'	additional \$0.75 per foot
	151' to 200'	additional \$1.25 per foot
Penetration pay:	0' to 50'	no additional fee
	51' to 100'	additional \$0.75 per foot
	101' to deeper	additional \$1.00 per foot

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked:

Carpenter(s)	\$ 27.12
Diver(s)	27.12

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (2, 17) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
50%	60%	70%	80%

Supplemental benefits per hour worked:

1st	2nd	3rd	4th
\$10.25	\$10.25	\$12.85	\$12.85

12-276HH-Erie

Electrician **06/01/2016**

JOB DESCRIPTION Electrician

DISTRICT 3

ENTIRE COUNTIES

Erie

PARTIAL COUNTIES

Cattaraugus: Only the Townships of Ashford, East Otto, Ellicottville, Farmersville, Freedom, Franklinville, Lyndon, Machias, Mansfield, New Albion, Otto, Perrysburg, Persia and Yorkshire.

Genesee: Only the Townships of Alabama, Alexander, Darien, Oakfield, Pembroke and that portion of the Towns of Batavia and Elba that are west of Little Tonawanda Creek; Tonawanda Creek; the City limits of Batavia (in effect prior to Feb. 1, 1970) and State Highway 98 north of the City of Batavia, then north on Highway 98 to the Orleans County line.

Wyoming: Only the Townships of Arcade, Attica, Bennington, Eagle, Java, Orangeville, Sheldon and Wethersfield.

WAGES

Per hour:	07/01/2015	05/30/2016	05/29/2017
Electrician*	\$ 34.14	Additional \$ 1.70	Additional \$ 1.85

* Includes teledata work

When shift work is mandated either in the job specification or by the contracting agency the following premiums apply:

17.3% for work from 4:30PM - 1:00AM

31.4% for work from 12:30AM - 9:00AM

Additional \$0.50/hr in shafts over 25 ft. deep and in underground tunnels over 75 ft. long.

Additional \$0.75/hr for work on toothpicks, structural steel, temporary platforms, swinging scaffolds, boatswain chairs, smoke stacks or water towers 30 ft above the floor or for work on rolling scaffolds and ladders over 50 ft.

Additional \$1.50/hr for Cable Splicers on such work as lead, and shielded cable and splices or terminations on cable 5KV and above.

Additional \$1.00/hr for Hot work (Atomic plants).

Additional \$2.00/hr for work on radio, TV, light towers and floating platforms or climbing ladders in excess of 100 ft. high.

SUPPLEMENTAL BENEFITS

Per hour worked:

\$ 23.05*

* NOTE - add 3% of the posted straight time or applicable premium wage rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following wages:

0 to 1000	to 2000	to 3500	to 5000	to 6500	to 8000
\$ 12.65	\$ 13.65	\$ 15.35	\$ 18.80	\$ 23.90	\$ 27.30

Supplemental benefits per hour worked:

0 to 2000 to 6500 to 8000
 \$ 11.80* \$ 19.80* \$ 23.05*

* NOTE - add 3% of the posted straight time or applicable premium wage rate.

3-41

Elevator Constructor **06/01/2016**

JOB DESCRIPTION Elevator Constructor **DISTRICT 3**

ENTIRE COUNTIES
 Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour:	07/01/2015	01/01/2016	01/01/2017
Elevator Constructor	\$ 44.84	\$ 45.77	\$ 46.79
Helper	31.39	32.04	32.75

**** IMPORTANT NOTICE - EFFECTIVE 04/01/2009 ****
 Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked:	\$ 28.39*	\$ 29.99*	\$ 31.59
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* Note - add 6% of regular hourly rate for all hours worked.

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

REGISTERED APPRENTICES
 Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st*	2nd	3rd	4th
55%	65%	70%	80%

Supplemental benefits per hour worked:	\$ 28.39**	\$ 29.99**	\$ 31.59**
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* Note - 0-6 months of the 1st year term is paid at 50% of Journeyman's wage with no Supplemental benefits.

** Note - add 6% of regular hourly rate for all hours worked.

3-14

Glazier **06/01/2016**

JOB DESCRIPTION Glazier **DISTRICT 3**

ENTIRE COUNTIES
 Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour:	07/01/2015	05/01/16 Additional	05/01/2017 Additional
Glazier	\$ 26.00	\$ 1.00	\$ 1.35
Working off Suspended Scaffold (Swing Stage)	27.00	1.00	1.35
Maintenance	12.25*	0.85	1.00

* Note - This rate to be used only for all repair and replacement work such as glass breakage, glass replacement, door repair and board ups.

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked:
 Journeymen Glazier \$ 18.97
 Maintenance 11.94

OVERTIME PAY

See (B, E2, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE for Glazier and Glazier Apprentices.
 Paid: See (5, 6) on HOLIDAY PAGE for Maintenance
 Overtime: See (5, 6) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

Glazier: 1000 hour terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th	5th	6th	7th	8th
40%	45%	50%	55%	60%	70%	80%	90%

Supplemental benefits per hour worked:

1st & 2nd terms \$ 7.45
 3rd & 4th terms 8.30
 All other terms 9.20

3-660

Insulator - Heat & Frost 06/01/2016

JOB DESCRIPTION Insulator - Heat & Frost

DISTRICT 3

ENTIRE COUNTIES

Allegany, Cattaraugus, Chautauqua, Erie, Niagara, Wyoming

PARTIAL COUNTIES

Genesee: Only the Townships of Alabama, Alexander, Darien, Oakfield and Pembroke.

WAGES

Per Hour: 07/01/2015 05/01/2016
 Heat & Frost Insulator \$ 31.50 Additional \$ 1.30

SUPPLEMENTAL BENEFITS

Per hour worked:
 \$ 20.74

OVERTIME PAY

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

* Note - Double time after 10 hours on Saturday.

** Note - Triple time on Labor Day if WORKED.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
50%	60%	70%	80%

Supplemental Benefits per hour worked:

1st and 2nd \$ 16.44
 All other terms 20.74

3-4

Ironworker 06/01/2016

JOB DESCRIPTION Ironworker

DISTRICT 3

ENTIRE COUNTIES

Cattaraugus, Chautauqua

PARTIAL COUNTIES

Allegany: Entire county except the Towns of Birdsall, Burns and Grove.

Erie: All except the Town of Grand Island north of Whitehaven Road.

Genesee: Only the Townships of Alabama, Alexander, Darien and Pembroke

Steuben: Only the Townships of Canisteo, Freemont, Greenwood, Hartsville, Hornell, Hornellsville, Howard, Jasper, Troupsburg and West

Union

Wyoming: Only the Townships of Arcade, Attica, Bennington, Eagle, Gainsville, Java, Orangeville, Pike, Sheldon, Warsaw and Wethersfield.

WAGES

Per hour:	07/01/2015	05/01/2016 Additional	05/01/2017 Additional
Structural	\$ 29.53	\$ 1.25	\$ 1.25
Ornamental	29.53	1.25	1.25
Layout	29.53	1.25	1.25
Rodmen	29.53	1.25	1.25
Reinforcing	29.53	1.25	1.25
Welders	29.53	1.25	1.25
Riggers & Mach. Movers	29.53	1.25	1.25
Window Erector	27.18	1.25	1.25
Fence Erector	28.10	1.25	1.25

SUPPLEMENTAL BENEFITS

Per hour worked:

Fence erectors	\$ 23.72
All others	25.22

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following wage:			
1st	2nd	3rd	4th
\$ 16.50	\$ 18.50	\$ 20.50	\$ 22.50

Supplemental benefits per hour worked:

1st	2nd	3rd	4th
\$ 10.78	\$ 19.34	\$ 20.56	\$ 21.79

3-6

Ironworker **06/01/2016**

JOB DESCRIPTION Ironworker

DISTRICT 3

ENTIRE COUNTIES

Niagara

PARTIAL COUNTIES

Erie: Only that portion of the Township of Grand Island north of Whitehaven Road.

Orleans: Only the Townships of Ridgeway, Shelby and Yates.

WAGES

Per hour:	07/01/2015	05/01/2016 Additional	05/01/2017 Additional
Structural	\$ 30.12	\$ 1.25	\$ 1.25
Ornamental	30.12	1.25	1.25
Reinforcing	30.12	1.25	1.25
Rigger & Mach. Mover	30.12	1.25	1.25
Pre-Engineered	30.12	1.25	1.25
Fence Erector	30.12	1.25	1.25
Pre-Cast Erector	30.12	1.25	1.25
Welder	30.12	1.25	1.25
Window Erector	30.12	1.25	1.25
Sheeter	33.02	1.25	1.25

SUPPLEMENTAL BENEFITS

Per hour worked: \$ 24.88

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following wage:

1st term	\$ 16.50
2nd term	18.50
3rd term	20.50
4th term	22.50

Supplemental benefits per hour worked:

1st term	\$ 10.25
2nd term	16.73
3rd term	17.65
4th term	18.58

3-9

Laborer - Building **06/01/2016**

JOB DESCRIPTION Laborer - Building

DISTRICT 3

ENTIRE COUNTIES

Erie

PARTIAL COUNTIES

Cattaraugus: Only the Townships of Perrysburg and the Village Gowanda.

WAGES

CLASS A: Basic, Safety Man, Flagman, Tool Room Man, Nurseryman, Demolition Worker, Top Man, Wrecker, IBC Barriers Except on Structures, Guard Rail, Asphalt Shovelers, Foundation Laborer over 8' in Depth, Hod Carriers, Plaster Tender, Plaster Scaffold Builder, Pneumatic Gas, Electric Tool Operator including all forms of Busters, Jackhammers and Chipping Guns, Steel Burners.

CLASS B: Mortar Mixer, Asphalt Smoothers, Pneumatic Gas, Electric Tool Operator including all forms of Busters, Jackhammers and Chipping Guns over 8' in depth.

CLASS C: Worker on any Swing Scaffold, Blaster, Plumbing Laborer, Wagon Drill Operator, Bottomman (caisson or cofferdam), Laser Setter, Asphalt Rakers, Asphalt Screed Man.

CLASS D: Stone Cutter, Curb Setter and Flag Layer.

CLASS E: Asbestos Removal, Deleader.

CLASS F: Hazardous Waste Worker.

Per hour: 07/01/2015

Building Laborer:

CLASS A	\$ 25.13
CLASS B	25.30
CLASS C	25.41
CLASS D	25.88
CLASS E	26.13
CLASS F	27.13

SUPPLEMENTAL BENEFITS

Per hour worked: \$ 23.15

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (22) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following percentage of Journeyman's wage:

0 to 500 to 1000 to 1500 to 2000 to 2500 to 3000 to 4000
 55% 60% 65% 70% 75% 80% 90%

Supplemental benefits per hour worked:

\$ 23.15

3-210b

Laborer - Heavy&Highway 06/01/2016

JOB DESCRIPTION Laborer - Heavy&Highway

DISTRICT 3

ENTIRE COUNTIES

Erie

WAGES

Heavy/Highway Laborer:

GROUP A: Basic, Drill Helper, Flagman, Outboard and Hand Boats, Demolition Worker, Nurseryman, IBC Barriers (except on structures), Guard Rails, Road Markers.

GROUP B: Grade Checker, Chain Saw, Concrete Aggregate Bin, Concrete Bootmen, Gin Buggy, Hand or Machine Vibrator, Jack Hammer, Mason Tender, Mortar Mixer, Pavement Breaker, Handlers of Steel Mesh, Small Generators for Laborers' Tools, Pipe Layers, Vibrator Type Rollers, Tamper, Drill Doctor, Tail or Screw Operator on Asphalt Paver, Water Pump Operators (2" and Single Diaphragm), Nozzle (Asphalt, Gunite, Seeding, and Sand Blasting), Laborers on Chain Link Fence Erection, Rock Splitter and Power Unit, Pusher Type Concrete Saw and all other Gas, Electric, Oil and Air Tool Operators, Wrecking Laborer and Laser Man.

GROUP C: All Rock or Drilling Machine Operators (Except Quarry Master and Similar Type), Acetylene Torch Operators, Asphalt Raker, Powderman and Welder.

GROUP D: Blasters, Curb and Flatwork Formsetter not on structures, Stone or Granite Curb Setters and Stone Cutter.

Per hour:	07/01/2015	07/01/2016	07/01/2017
Heavy/Highway Laborer:		Additional	Additional
GROUP A	\$ 27.66	\$ 1.50	\$ 1.50
GROUP B	27.86	1.50	1.50
GROUP C	28.06	1.50	1.50
GROUP D	28.26	1.50	1.50

For all Deleader & Asbestos work add 1.00 to Group A rate.

For all Hazardous waste work add 2.00 to Group A rate.

An additional \$3.00 per hour is required when a single irregular work shift starting any time from 5:00PM to 1:00AM is mandated either in the job specification or by the contracting agency.

Sewer/Water Laborer:

GROUP A: Basic, Flagman, Top man, Wreckers.

GROUP B: Foundation, Plaster tender, Scaffold bootman, Pneumatic, gas, electric, tool operator, jackhammer, chipping guns.

GROUP C: Mortar Mixer, over 8 ft. in depth.

GROUP D: Pavement formsetter, Steelburner, Caisson, Wagon Drill Oper., PipeLayer, Swing Scaffold.

GROUP E: Utility pave driver, Laser operator.

GROUP F: Blaster.

Per hour:	07/01/2015	07/01/2016	07/01/2017
Sewer/Water Laborer:		Additional	Additional
GROUP A	\$ 27.66	\$ 1.50	\$ 1.50
GROUP B	27.76	1.50	1.50
GROUP C	27.81	1.50	1.50
GROUP D	27.91	1.50	1.50
GROUP E	28.26	1.50	1.50
GROUP F	28.66	1.50	1.50

For all Deleader & Asbestos work add 1.00 to Group A rate.

For all Hazardous waste work add 2.00 to Group A rate.

An additional \$3.00 per hour is required when a single irregular work shift starting any time from 5:00PM to 1:00AM is mandated either in the job specification or by the contracting agency.

SUPPLEMENTAL BENEFITS

Per hour worked: \$ 23.65

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following percentage of Journeyman's wage:

0 to 500 to 1000 to 1500 to 2000 to 2500 to 3000 to 4000
 55% 60% 65% 70% 75% 80% 90%

Supplemental benefits per hour worked:

\$ 23.65

3-210h

Laborer - Tunnel 06/01/2016

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 3

ENTIRE COUNTIES

Erie

WAGES

CLASS A: Mole Nipper, Powder Handler, Changehouse Attendant and Top Laborer.

CLASS B: Air Spade, Jackhammer, Pavement Breaker.

CLASS C: Top Bell.

CLASS D: Bottom Bell, Side or Roofbelt Driller, Maintenance men, Burners, Block Layers, Rodmen, Caulkers, Miners helper, Trackmen, Nippers, Derailmen, Electrical Cablemen, Hosemen, Groutmen, Gravelmen, Form Workers, Movers and Shaftmen, Conveyor-men.

CLASS E: Powder Monkey.

CLASS F: Blasters, Ironmen and Cement Worker, Miner, Welder, Heading Driller.

CLASS G: Steel Erectors, Piledriver, Rigger.

Per hour:	07/01/2015	07/01/2016	07/01/2017
Tunnel Laborer:		Additional	Additional
CLASS A	\$ 28.16	\$ 1.50	\$ 1.50
CLASS B	28.31	1.50	1.50
CLASS C	28.41	1.50	1.50
CLASS D	28.91	1.50	1.50
CLASS E	29.01	1.50	1.50
CLASS F	29.41	1.50	1.50
CLASS G	29.66	1.50	1.50

For all Deleader & Asbestos work add 1.00 to Group A rate.

For all Hazardous waste work add 2.00 to Group A rate.

An additional \$3.00 per hour is required when a single irregular work shift starting any time from 5:00PM to 1:00AM is mandated either in the job specification or by the contracting agency.

SUPPLEMENTAL BENEFITS

Per hour worked: \$ 23.65

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following percentage of Journeyman's wage:

0 to 500 to 1000 to 1500 to 2000 to 2500 to 3000 to 4000
 55% 60% 65% 70% 75% 80% 90%

Supplemental benefits per hour worked:

\$ 23.65

3-210t

Lineman Electrician 06/01/2016

JOB DESCRIPTION Lineman Electrician

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, Wyoming, Yates

WAGES

Per hour:

NOTE: Includes Teledata Work within ten (10) feet of High Voltage Transmission Lines

Below rates applicable on all overhead and underground distribution and maintenance work, and all overhead and underground transmission line work and the installation of fiber optic cable where no other construction trades are or have been involved. (Ref #14.01.01)

	07/01/2015	05/02/2016
Lineman, Technician	\$ 46.90	Additional \$ 2.50
Crane, Crawler Backhoe	46.90	2.50
Welder, Cable Splicer	46.90	2.50
Digging Machine Operator	42.21	2.50
Tractor Trailer Driver	39.87	2.50
Groundman, Truck Driver	37.52	2.50
Mechanic 1st Class	37.52	2.50
Flagman	28.14	2.50

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all electrical sub-stations, switching structures, fiber optic cable and all other work not defined as "Utility outside electrical work". (Ref #14.02.01-A)

		Additional
Lineman, Technician	\$ 46.90	\$ 2.50
Crane, Crawler Backhoe	46.90	2.50
Cable Splicer-Pipe Type Cable	51.59	2.50
Cert. Welder-Pipe Type Cable	49.25	2.50
Digging Machine Operator	42.21	2.50
Tractor Trailer Driver	39.87	2.50
Mechanic 1st Class	37.52	2.50
Groundman, Truck Driver	37.52	2.50
Flagman	28.14	2.50

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates apply on switching structures, maintenance projects, railroad catenary install/maintenance third rail installation, bonding of rails and pipe type cable and installation of fiber optic cable. (Ref #14.02.01-B)

		Additional
Lineman, Technician, Welder	\$ 48.20	\$ 2.50
Crane, Crawler Backhoe	48.20	2.50

Digging Machine Operator	43.38	2.50
Tractor Trailer Driver	40.97	2.50
Groundman, Truck Driver	38.56	2.50
Mechanic 1st Class	38.56	2.50
Flagman	28.92	2.50
Cert. Welder-Pipe Type Cable	50.61	2.50
Cable Splicer-Pipe Type Cable	53.02	2.50

Additional \$1.00 per hour for entire crew when a helicopter is used.

Below rates applicable on all overhead and underground transmission line work & fiber optic cable where other construction trades are or have been involved. This applies to transmission line work only, not other construction. (Ref #14.03.01)

		Additional
Lineman, Technician, Welder	\$ 49.41	\$ 2.50
Crane, Crawler Backhoe	49.41	2.50
Cable Splicer	49.41	2.50
Digging Machine Operator	44.47	2.50
Tractor Trailer Driver	42.00	2.50
Groundman, Truck Driver	39.53	2.50
Mechanic 1st Class	39.53	2.50
Flagman	29.65	2.50

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 %

**** IMPORTANT NOTICE ****

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.
 *Effective 05/06/2013, Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

The following SUPPLEMENTAL BENEFITS apply to all classification categories of CONSTRUCTION, TRANSMISSION and DISTRIBUTION.

Journeyman	\$ 20.50
	*plus 7% of hourly wage

*The 7% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q,) on OVERTIME PAGE. *Note* Double time for all emergency work designated by the Dept. of Jurisdiction.

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: 1000 hour terms at the following percentage of the Journeyman Lineman wage.

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

SUPPLEMENTAL BENEFITS: Same as Journeyman

6-1249a

Lineman Electrician - Teledata **06/01/2016**

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.

	07/01/2015	01/01/2016	01/01/2017
Cable Splicer	\$ 29.70	\$ 30.29	\$ 30.90
Installer, Repairman	28.19	28.75	29.33
Teledata Lineman	28.19	28.75	29.33
Technician, Equipment Operator	28.19	28.75	29.33
Groundman	14.95	15.25	15.56

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

SUPPLEMENTAL BENEFITS

Per hour worked:

Journeyman	\$ 4.43	\$ 4.43	\$ 4.43
	*plus 3% of wage paid	*plus 3% of wage paid	*plus 3% of 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

HOLIDAY

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

6-1249LT - Teledata

Lineman Electrician - Traffic Signal Lighting **06/01/2016**

JOB DESCRIPTION Lineman Electrician - Traffic Signal Lighting

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Warren, Washington, Wayne, Wyoming, Yates

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, chain saws, 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/groundman truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only.

(Ref #14.01.01)

Per hour:	07/01/2015	05/02/2016
		Additional
Lineman, Technician	\$ 41.04	\$ 2.00
Crane, Crawler Backhoe	41.04	2.00
Certified Welder	43.09	2.00
Digging Machine	36.94	2.00
Tractor Trailer Driver	34.88	2.00
Groundman, Truck Driver	32.83	2.00
Mechanic 1st Class	32.83	2.00
Flagman	24.62	2.00

Above rates applicable on all Lighting and Traffic Signal Systems with the installation, testing, operation, maintenance and repair of all traffic control and illumination projects, traffic monitoring systems, road weather information systems and the installation of Fiber Optic Cable.

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%

**** IMPORTANT NOTICE ****

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.
 *Effective 05/06/2013, Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

Journeyman	\$ 20.50
	*plus 7.0% of hourly wage

*The 7% is based on the hourly wage paid, straight time rate or premium rate.
 Supplements paid at STRAIGHT TIME rate for holidays.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE. *Note* Double time for all emergency work designated by the Dept. of Jurisdiction

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.

1st	2nd	3rd	4th	5th	6th	7th
\$ 24.62	\$ 26.68	\$ 28.73	\$ 30.78	\$ 32.83	\$ 34.88	\$ 36.94

SUPPLEMENTAL BENEFITS: Same as Journeyman

6-1249a-LT

Lineman Electrician - Tree Trimmer **06/01/2016**

JOB DESCRIPTION Lineman Electrician - Tree Trimmer

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, Wyoming, Yates

WAGES

Per hour:

Applies to line clearance, tree work and right-of-way preparation on all new or existing energized overhead or underground electrical, telephone and CATV lines. This also would include stump removal near underground energized electrical lines, including telephone and CATV lines.

07/01/2015

Tree Trimmer	\$ 22.80
Equipment Operator	20.11
Equipment Mechanic	20.11
Truck Driver	17.00
Groundman	13.94
Flag person	9.93

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

Journeyman	\$ 9.14
	*plus 3% of hourly wage

* The 3% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

NOTE: All paid holidays falling on a Saturday shall be observed on the preceding Friday.
All paid holidays falling on a Sunday shall be observed on the following Monday.

6-1249TT

Mason - Building

06/01/2016

JOB DESCRIPTION Mason - Building

DISTRICT 5

ENTIRE COUNTIES

Erie, Niagara

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per Hour:	07/01/2015	07/01/2016
Building:		Additional
Bricklayer	\$ 30.94	\$ 1.40
Stone Mason	30.94	1.40
Tuck Pointer	30.94	1.40

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked:

Journeyman	\$ 23.24
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OVERTIME PAY

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

*Note - Or other conditions beyond the employer's control such as fire or natural disaster.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

1250 hour terms at the following wage:

1st	2nd	3rd	4th
\$ 17.71	\$ 18.02	\$ 21.28	\$ 25.16

Supplemental benefits per hour worked:

1st	2nd	3rd	4th
\$ 9.31	\$ 15.79	\$ 17.31	\$ 18.81

5-3B-Z3

Mason - Building **06/01/2016**

JOB DESCRIPTION Mason - Building

DISTRICT 3

ENTIRE COUNTIES

Erie, Niagara

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour:	07/01/2015	04/01/2016
Plasterer	\$ 28.65	\$ 28.65

Additional \$2.00/hr for work on swing stage over 20 feet.

SUPPLEMENTAL BENEFITS

Per hour worked:	\$ 16.99	\$ 18.49
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OVERTIME PAY

Exterior work only See (B, E, E2, Q) on OVERTIME PAGE.
All other work See (B, E, Q) on OVERTIME PAGE.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following dollar amounts:

0 to 1000	to 2000	to 3000	to 4000	to 4700	to 5400	to 6000
\$ 11.30	\$ 12.30	\$ 13.30	\$ 14.30	\$ 16.30	\$ 17.30	\$ 18.30

Supplemental benefits per hour worked:

Hour terms at the following dollar amounts:

0 to 500	to 4700	to 5400	to 6000
\$ 0.50	\$ 2.50	\$ 3.50	\$ 4.50

3-9-Pltr

Mason - Building / Heavy&Highway **06/01/2016**

JOB DESCRIPTION Mason - Building / Heavy&Highway

DISTRICT 3

ENTIRE COUNTIES

Erie

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour:	07/01/2015
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Cement Mason	\$ 30.00
Additional \$0.25 per hr for Swing scaffold or exterior scaffold 42' or higher.	

SUPPLEMENTAL BENEFITS

Per hour paid:	\$ 26.72
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OVERTIME PAY

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

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following dollar amounts:

1st	2nd	3rd	4th	5th	6th
\$ 12.65	\$ 13.65	\$ 14.65	\$ 17.65	\$ 19.65	\$ 21.65

Supplemental benefits per hour paid:

1st	2nd	3rd	4th	5th	6th
\$ 6.61	\$ 9.37	\$ 11.05	\$ 14.13	\$ 16.20	\$ 19.35

3-111Erie

Mason - Heavy&Highway **06/01/2016**

JOB DESCRIPTION Mason - Heavy&Highway

DISTRICT 5

ENTIRE COUNTIES

Allegany, Broome, Chautauqua, Chemung, Chenango, Cortland, Delaware, Genesee, Livingston, Monroe, Ontario, Orleans, Otsego, Schuyler, Seneca, Steuben, Tioga, Tompkins, Wayne, Wyoming, Yates

PARTIAL COUNTIES

Cattaraugus: Entire county except in the Township of Perrysburg and the Village of Gowanda only the Bricklayer classification applies.
 Erie: Only the Bricklayer classification applies.
 Niagara: Only the Bricklayer classification applies.

WAGES

Per hour:	07/01/2015	07/01/2016
Heavy & Highway:		Additional
Cement Mason	\$29.87	\$1.38
Bricklayer	29.87	1.38

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked:

Journeyman \$ 19.52

OVERTIME PAY

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

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

1500 hour terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
50%	60%	70%	80%

Supplemental benefits per hour worked:

1st term	\$ 11.12
2nd - 4th term	19.52

5-3h

Mason - Tile Finisher **06/01/2016**

JOB DESCRIPTION Mason - Tile Finisher

DISTRICT 5

ENTIRE COUNTIES

Erie, Niagara, Orleans

PARTIAL COUNTIES

Cattaraugus: Only the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour: 07/01/2015
Building:
Marble, Slate, Terrazzo \$ 29.01
and Tile Finisher 29.01

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked: \$ 14.36

OVERTIME PAY

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

*Note - Or other conditions beyond the employer's control such as fire or natural disaster.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

1200 hours 1st and 2nd term and 1300 hours 3rd term at the following wage:

1st	2nd	3rd
\$ 15.04	\$ 17.68	\$ 23.73

Supplemental benefits per hour worked:

1st	2nd	3rd
\$ 6.57	\$ 8.28	\$ 10.94

5-3TF - Z3

Mason - Tile Setter 06/01/2016

JOB DESCRIPTION Mason - Tile Setter

DISTRICT 5

ENTIRE COUNTIES

Erie, Niagara, Orleans

PARTIAL COUNTIES

Cattaraugus: Only in the Township of Perrysburg and the Village of Gowanda.

WAGES

Per hour: 07/01/2015 07/01/2016
Building: Additional
Marble, Slate, Terrazzo \$ 31.21 \$ 1.40
and Tile Setter 31.21 1.40

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked: \$ 22.47

OVERTIME PAY

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

*Note - Or other conditions beyond the employer's control such as fire or natural disaster.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

1250 hour terms at the following wage:

1st	2nd	3rd	4th
\$ 17.36	\$ 17.73	\$ 20.97	\$ 25.00

Supplemental benefits per hour worked:

1st	2nd	3rd	4th
\$ 9.41	\$ 15.76	\$ 17.26	\$ 18.56

5-3TS - Z3

Millwright **06/01/2016**

JOB DESCRIPTION Millwright

DISTRICT 12

ENTIRE COUNTIES

Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour:	07/01/2015	07/01/2016
Millwright	\$ 30.66	Additional
Certified Welder	31.91	\$ 1.40/Hr
Hazardous Waste Work	31.99	
Field Machinist	31.99	

SUPPLEMENTAL BENEFITS

Per hour Paid:	\$ 25.64
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OVERTIME PAY

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

*Note - Saturday may be used as a make-up day and worked at the straight time rate of pay during a work week when conditions such as weather, power failure, fire, or natural disaster prevent the performance of work on a regular scheduled work day.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

1300 hour terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th
60%	70%	80%	90%

Supplemental Benefits per hour worked:

1st	2nd	3rd	4th
\$ 9.95	\$ 20.94	\$ 22.50	\$ 24.08

12-1163-Gen/Nia/Orl/Wyo

Operating Engineer - Building **06/01/2016**

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 12

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

CLASS A: Air Hoist, All Boom Type Equipment, All Pans and Carry-Alls, Archer Hoist, Asphalt Curb and Gutter Machines, Asphalt Roller, Asphalt Spreader or Paver, Automatic Fine Grade Machine (CMI or similar, first and second operator), Backhoe and Pullhoe, Backhoe and Pullhoe (tractor mounted, rubber tired), Back Filling Machine, Belt Placer (CMI or similar type), Bending Machine (Pipe), Bituminous Spreader and Mixer, Blacktop Plants (Automated and Non-automated), Blast or Rotary Drill (Truck or Track Mounted), Blower for Burning Brush, Boiler (when used for power), Boom Truck (excluding pick-up and delivery), Boring Machine, Bulldozer, Cableway, Cage Hoist, Caisson Auger, Central Mix Plant (and all concrete batching plants), Cherry Picker, Concrete Cleaning Decontamination Machine Operator, Concrete Curb and Gutter Machine, Concrete Curing Machine, Concrete Cutters (Vermeer or Similar Type), Concrete Mixer (over 1/2 cu yd.), Concrete Pavement Spreaders and Finishers, Concrete Paver, Concrete Pump, Conveyor, Core Drill, Crane, Crusher, Decon of Equipment, Derrick, Dragline, Dredge, Drill Rig (Tractor Mounted), Dual Drum Paver, Electric Pump used in conjunction with Well Point Systems, Elevating Grader (self propelled or towed), Elevator, Excavator (all purpose, hydraulically operated), Farm Tractor with Accessories, Fine Grade Machine, Forklift, Front End Loader, Generator (10 outlets or more), Gradall, Grader, Grout or Guniting Machine, Head Tower, Heavy Equipment Robotics Operator/Mechanic, Helicopter (when used for hoisting), Hoist (one drum), Hoisting Engine, Horizontal Directional Drill Locator, Horizontal Directional Drill Operator, Hydraulic Boom, Hydraulic Hammer (self-propelled), Hydraulic Pipe Jack Machine (or similar type machine), Hydraulic Rock Expander (or similar type machine), Hydraulic System Pumps, Hydro Crane, Hydro Hammer (or similar type), Industrial Tractor, Jersey Spreader, Kolman Plant Loader (and similar type loaders), Laser Screed, Locomotive, Lubrication Truck, Maintenance Engineer, Maintenance, Lubrication Unit or Truck, Mine Hoist, Mixer for Stabilized Base (self-propelled), Monorail, Motorized Hydraulic Pin Puller, Motorized Hydraulic Seeder, Mucking Machine, Mulching Machine, Multiple Drum Hoist (more than one drum in use), Overhead Crane, Peine Crane (or similar type), Pile Driver, Plant Engineer, Pneumatic Mixer, Post Hole Digger and Driver, Power Broom, Pump Crete, Push Button Hoist, Push or Snatch Cat, Quarry Master or equivalent, Road Widener, Rock Bit Sharpener (all types), Roller (all), Rolling Machine (pipe), Rotomill, Scissors Trucks, Lift, or Boom Lift of any type (when used for hoisting), Scoopmobile, Shovel, SideBoom, Skidsteer/Bobcat (Similar Type), Skimmer, Slip Form Paver (CMI or similar type), Snorkel/Vacuum Truck, Strato-Tower, Stump Chipping Machine, Tire Truck and Drivers performing tire repair (exclude outside vendor), Towed Roller, Tractor Drawn Belt-Type Grader/Loader, Tractor Shovel, Tractor with Towed Accessories, Tractor (when using winch power), Tractors, Trencher, Truck Crane, Truck Mechanic and Helper (exclude Teamsters when repairing their own trucks), Tunnel Shovel, Tube Finisher (CMI and similar type), Ultra High Pressure Waterjet Cutting Tool System Operator/Mechanic, Vacuum Blasting Machine Operator/Mechanic, Vibratory Compactor, Vibro Tamp, Well Drilling Machine, Well Point, Winch, Winch Truck with A Frame.

CLASS B: Aggregate Bin, Aggregate Plant, Apprentice Engineer, Apprentice Engineer Driver, Articulated Off Road Material Hauler, Boiler (used in conjunction with production), CMI and similar type Concrete Spreads (Apprentice Engineer), Cement Bin, Chipping Machine and Chip Spreader, Compressors (4 or less), Compressors (any size, but subject to other provisions for Compressors, Dust Collectors, Generators, Mechanical Heaters, Pumps, Welding Machines - four of any type or combination), Concrete Mixer (1/2 cu. yd. and under), Fireman, Form Tamper, Form Trucks (excluding Teamster or delivery), Fuel Truck or Drivers (exclude Teamster or delivery), Heaters, Heating Boiler (used for temporary heat), Helper on Lubrication Unit or Truck, Jeep Trencher, Power Heaterman, Power Plant in excess of 10 K.W., Pumps, Revinus Widener, Steam Boilers (if manning or license by local law is required), Steam Cleaner (when used for cleaning equipment on the job site), Welding Machine (1 machine over 300 amps or 2 or 3 machines regardless of amps).

Operating Engineer- Building:

Per hour:	07/01/2015
Master Mechanic	\$ 34.45
Asst.Master Mechanic	33.81
Crane(boom over 100ft)	33.86
" (boom over 200ft)	34.36
" (boom over 300ft)	35.36
CLASS A	33.36
CLASS B	28.88

Additional \$1.00 per hour for tunnel work.
Additional \$2.50 per hour for CHEMICAL, HAZARDOUS OR TOXIC WASTE projects.
Additional \$3.00 per hour for all lattice boom cranes and any hydraulic crane over 60 ton capacity.

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyman	\$ 28.40*
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*Note: \$7.20 of this amount must be paid at the same premium as the wage for overtime hours.

OVERTIME PAY

See (B, E, P) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

New Apprentices, after date of signing, receive the follow wage rates:
First Year: 87.5% of wage rate for the job being performed

Second Year: 90% of wage rate for the job being performed
 Third Year: 92.5% of wage rate for the job being performed
 Fourth Year: 95% of wage rate for the job being performed

Supplemental benefits Per Hour:

Apprentice Engineers \$ 28.00*

*Note: \$6.80 of this amount must be paid at the same premium as the wage for overtime hours.

12-17b

Operating Engineer - Heavy&Highway **06/01/2016**

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 12

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

CLASS A: Air Hoist, All Boom Type Equipment, All Pans and Carry-Alls, Asphalt Curb and Cutter Machines, Asphalt Roller, Asphalt Spreader or Paver, Automatic Fine Grade Machine (CMI or similar, first and second operator), Backhoe and Pullhoe (all), Back Filling Machine, Belt Placer (CMI or similar type), Bending Machine (pipe), Bituminous Spreader and Mixer, Blacktop Plant (all), Blast or Rotary Drill (Truck or Track Mounted), Blower for Burning Brush, Boiler (when used for power), Boom Truck, Boring Machine, Bulldozer, Cableway, Cage Hoist, Caisson Auger, Central Mix Plant (and all Concrete Batching Plants), Cherry Picker, Concrete Cleaning Decontamination Machine, Concrete Curb and Gutter Machine, Concrete Curing Machine, Concrete Mixer (over 1/2 cu. yd.), Concrete Pavement Spreaders and Finishers, Concrete Paver, Concrete Pump, Concrete Saw (self propelled), Conveyor, Convoying Vehicles Convoying Engineer's Equipment, Core Drill, Crane, Crusher, Decontamination of Equipment, Derrick, Dragline, Dredge, Drill Rig (Tractor Mounted), Dual Drum Paver, Electric Pump used in conjunction with Well Point Systems, Elevating Grader (self propelled or towed), Elevator, Excavator (all purpose, hydraulically operated), Farm Tractor with Accessories, Fine Grade Machine, Forklift, Front End Loader, Gradall, Grader, Grout or Gunite Machine, Head Tower, Heavy Equipment Robotics Operator/Mechanic, Hoist (all types), Hoisting Engine, Horizontal Directional Drill Locator, Horizontal Directional Drill Operator, Hydraulic Boom, Hydraulic Hammer (self propelled), Hydraulic Pipe Jack Machine, (or similar type machine), Hydraulic Rock Expander (or similar type machine), Hydraulic System Pumps, Industrial Tractor, Jersey Spreader, Kolman Plant Loader (and similar type Loaders), Laser Screed, Locomotive, Log Skidder (similar type), Maintenance Engineer, Maintenance, Lubrication Unit or Truck, Mine Hoist, Mixer for Stabilized Base (self propelled), Monorail, Motorized Hydraulic Pin Puller, Motorized Hydraulic Seeder, Mucking Machine, Mulching Machine, Overhead Crane, Parts Chasing, Peine Crane (or similar type), Pile Driver, Plant Engineer, Pneumatic Mixer, Post Hole Digger and Post Driver, Power Broom, Pump Crete, Push Button Hoist, Push or Snatch Cat, Quarry Master (or equivalent), Road Widener, Rock Bit Sharpener (all types), Roller (all), Rolling Machine (Pipe), Rotomill, Scoopmobile, Shovel, Side Boom, Skidsteer/Bobcat (similar type), Skimmer, Slip Form Paver (CMI or similar, first and second operator), Snorkel/Vacuum Truck, Strato-Tower, Tire Truck & Repair, Towed Roller, Tractor Drawn Belt-Type Grader/Loader, Tractor Shovel, Tractor with Towed Accessories, Tractors (when using winch power), Trencher, Truck Crane, Tug Boats, Tunnel Shovel, Tube Finisher (CMI and similar), Vacuum Blasting Machine Operator/Mechanic, Vibratory Compactor, Vibro Tamp, Waterjet Cutting Tool System Operator/Mechanic (Ultra High Pressure), Well Drilling Machine, Well Point, Winch, Winch Truck with A Frame.

CLASS B: Aggregate Bin, Aggregate Plant, Apprentice Engineer, Apprentice Engineer Driver, Articulated Off Road Material Hauler, CMI and similar type Concrete Spreads (Apprentice Engineer), Cement Bin, Chipping Machine and Chip Spreader, Compressors (4 or less), Compressors: any size, but subject to other provisions for Compressors, Dust Collectors, Generators, Mechanical Heaters, Pumps, Welding Machines (four of any type or combination), Concrete Mixer (1/2 cu. yd. and under), Fireman, Form Tamper, Fuel Truck, Heating Boiler (used for temporary heat), Helper on Lubrication Unit or Truck, Jeep Trencher, Power Heaterman, Power Plant in excess of 10 K.W., Pumps (4" or over), Revinus Widener, Steam Cleaner, Stump Chipping Machine, Welding Machine (1 machine over 300 amps or 2 or 3 machines regardless of amps).

Operating Engineer- Building Site, Heavy/Highway, Sewer/Water, Tunnel:

Per hour:	07/01/2015	07/01/2016
Master Mechanic	\$ 35.96	\$ 37.56
Asst.Master Mechanic	35.32	36.92
Crane(boom over 100ft)	35.64	37.24
" (boom over 200ft)	35.16	37.49
" (boom over 300ft)	36.39	37.99
CLASS A	34.89	36.49
CLASS B	30.39	31.99

Additional \$1.00 per hour for tunnel work

Additional \$2.50 per hour for CHEMICAL, HAZARDOUS OR TOXIC WASTE projects.

Additional \$3.00 per hour for all lattice boom cranes and any hydraulic crane over 60 ton capacity.

For work bid after 07/01/2014 an additional \$3.00 per hour when shift work is mandated either in the job specifications or by the contracting agency.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 28.91	\$ 28.91
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*Note: Overtime rate is \$39.71 per hour.

OVERTIME PAY

See (B, E, Q, W) on OVERTIME PAGE

Note: Code W* Excludes a portion of package at the overtime rate, equaling package to \$ 39.71 for supplements.

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

Note: Supplements pay for non-worked holiday is \$ 3.80 per hour.

REGISTERED APPRENTICES

Wages per hour:

Apprentices at 1 year terms

1st Term	\$25.70	\$27.99
2nd Term	26.34	28.79
3rd Term	26.97	29.59
4th Term	27.61	30.39

Supplemental Benefits

All Terms	\$28.51	\$28.51
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Note: Overtime rate is \$ 39.31 per hour. Supplements pay for non-worked holiday is \$ 3.80 per hour.

12-17 hh/sw/t

Operating Engineer - Marine Construction **06/01/2016**

JOB DESCRIPTION Operating Engineer - Marine Construction

DISTRICT 4

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, Schuylar, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per Hour:

DREDGING OPERATIONS 07/01/2015

CLASS A

Operator, Leverman, \$ 35.63
 Lead Dredgeman

CLASS A1

Dozer, Front Loader Operator To conform to Operating Engineer Prevailing Wage in locality where work is being performed including benefits.

CLASS B

Spider/Spill Barge Operator, \$ 30.81
 Tug Operator(over1000hp),
 OperatorII, Fill Placer,
 Derrick Operator, Engineer,
 Chief Mate, Electrician,
 Chief Welder,
 Maintenance Engineer

Certified Welder, \$ 29.01
 Boat Operator(licensed)

CLASS C

Drag Barge Operator, \$ 28.22

Steward, Mate,
Assistant Fill Placer,

Welder (please add)\$ 0.06

Boat Operator \$ 27.30

CLASS D
Shoreman, Deckhand, \$ 22.68
Rodman, Scowman, Cook,
Messman, Porter/Janitor

Oiler(please add)\$ 0.09

SUPPLEMENTAL BENEFITS

Per Hour:

THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

All Classes A & B 07/01/2015
\$ 9.99 plus 8%
of straight time
wage, Overtime hours
add \$ 0.63

All Class C \$ 9.69 plus 8%
of straight time
wage, Overtime hours
add \$ 0.48

All Class D \$ 9.39 plus 8%
of straight time
wage, Overtime hours
add \$ 0.33

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

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

4-25a-MarConst

Operating Engineer - Survey Crew 06/01/2016

JOB DESCRIPTION Operating Engineer - Survey Crew **DISTRICT** 12

ENTIRE COUNTIES
Cattaraugus, Chautauqua, Erie, Orleans, Wyoming

PARTIAL COUNTIES
Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES
These rates apply to Building and Heavy Highway.

Per hour:
SURVEY CLASSIFICATIONS:

Chief of Survey - One who directs a survey party.
Party Chief - One who directs the Instrument/Rod Person.
Instrument/Rod Person - One who holds the rods and, in general, assists the survey party.

07/01/2015

Chief of Survey \$ 37.86
Party chief 36.13
Instrument/Rod Person 24.06

Additional \$3.00 per hr. for work in a Tunnel.
Additional \$2.50 per hr. for EPA or DEC certified toxic or hazardous waste work.

SUPPLEMENTAL BENEFITS

Per hour worked:

Journeyman \$ 24.15

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

WAGES: 1000 hour terms for Instrument & Rod Persons at the following rates:

07/01/2015

0-1000 Hrs \$ 14.44
1001-2000 Hrs 18.23
2001-3000 Hrs 19.25

SUPPLEMENTAL BENEFITS per hour worked:

All Terms \$ 24.15

12-17D Sur

Operating Engineer - Survey Crew - Consulting Engineer 06/01/2016

JOB DESCRIPTION Operating Engineer - Survey Crew - Consulting Engineer

DISTRICT 12

ENTIRE COUNTIES

Cattaraugus, Chautauqua, Erie, Orleans, Wyoming

PARTIAL COUNTIES

Genesee: Only that portion of the county that lies west of a line down the center of Route 98 excluding that area that lies within the City of Batavia.

WAGES

These rates apply to feasibility and preliminary design surveying, line of grade surveying for inspection or supervision of construction when performed under a Consulting Engineer Agreement.

Per hour:

SURVEY CLASSIFICATIONS:

Chief of Party - One who directs a survey party.

Party Chief - One who directs Instrument/Rod Person.

Instrument/Rod Person - One who holds the rods and, in general, assists the survey party.

07/01/2015

Chief of Party \$ 37.86
Party Chief 36.13
Instrument/Rod Person 24.06

SUPPLEMENTAL BENEFITS

Per hour worked:

Journeyman \$ 24.15

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

12-17D Con Eng

Painter 06/01/2016

JOB DESCRIPTION Painter

DISTRICT 3

ENTIRE COUNTIES

Allegany, Erie, Genesee, Niagara, Orleans, Wyoming

PARTIAL COUNTIES

Cattaraugus: Entire County except the Townships of Conewango, Leon, Napoli, New Albion, Randolph and South Valley.
Chautauqua: Only the Townships of Awkright, Dunkirk, Hanover, Pomfret, Portland, Sheridan and Villenova.

Livingston: Only the Townships of North Dansville, Nunda, Ossian, Portage, Sparta, Spring Water and West Sparta.
 Steuben: Only the Townships of Avoca, Canisteo, Cohocton, Dansville, Fremont, Greenwood, Hartsville, Hornellsville, Howard, Jasper, Prattsburg, Pulteney, Troupsburg, Tuscarora, Urbana, Wayland, Wayne, Woodhull, West Union, Wheeler, and the City of Hornell.

WAGES

Per hour:	07/01/2015	05/01/2016
Basic Rate (Brush & Roll)	\$ 25.50	\$ 25.95
Spray painting, wallcovering	25.75	26.20
Abrasive and hydroblasting	25.75	26.20
Taping/DryWall Finisher	26.00	26.45
Skeleton Steel*	26.25	26.70

* Skeleton Steel: No floors, walls or ceiling are constructed, including radio and television towers, flagpoles, smokestacks, cranes and the abatement of coatings with lead, asbestos and/or arsenic, etc. All work within the confines of a plant shall be paid the skeleton steel rate (except in-plant tank work (see Tank Rate)).

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30R; and there must be a dispensation of hours in place on the project. If the PW30R is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked:		
	\$ 22.14	\$ 22.84

OVERTIME PAY

Exterior work only See (B, E4, F*, R) on OVERTIME PAGE.

All other work See (B, F*, R) on OVERTIME PAGE.

* Note - Saturday is payable at straight time if the employee misses work, except where a doctor's or hospital verification of illness is produced Monday through Friday when work was available to the employee.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

Painter/Decorator: 750 hour terms at the following percentage of Journeyman's Basic wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	90%

Taper/Drywall Finisher: 750 hour terms at the following percentage of Journeyman's Taper wage:

1st	2nd	3rd	4th	5th	6th
50%	55%	60%	65%	75%	85%

Supplemental benefits per hour worked:

Painter/Decorator and Taper/Drywall Finisher:		
1st & 2nd terms	\$ 2.22	\$2.27
3rd & 4th terms	5.22	5.27
All other terms	6.22	6.27

3-4-Buf, Nia, Olean

Painter 06/01/2016

JOB DESCRIPTION Painter

DISTRICT 3

ENTIRE COUNTIES

Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Cortland, Delaware, Erie, Genesee, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Schuyler, Seneca, St. Lawrence, Steuben, Tioga, Tompkins, Wayne, Wyoming, Yates

WAGES

Per hour:	07/01/2015	05/01/2016	05/01/2017 Additional	05/01/2018 Additional
Bridge*	\$ 38.00	\$ 38.00	\$ 1.25	\$ 1.25
Tunnel*	38.00	38.00	1.25	1.25
Tank*	36.00	36.00	1.25	1.25

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.

Tank rate applies to indoor and outdoor tanks, tank towers, standpipes, digesters, waste water treatment tanks, chlorinator tanks, etc. Covers all types of tanks including but not limited to steel tanks, concrete tanks, fiberglass tanks, etc.

* Note an additional \$1.00 per hour is required when the contracting agency or project specification requires any shift to start prior to 6:00am or after 12:00 noon.

SUPPLEMENTAL BENEFITS

Per hour worked: \$ 24.40 \$ 25.65

OVERTIME PAY

Exterior work only See (B, E4, F*, R) on OVERTIME PAGE.

All other work See (B, F*, R) on OVERTIME PAGE.

*Note - Saturday is payable at straight time if the employee misses work, except where a doctor's or hospital verification of illness is produced Monday through Friday when work was available to the employee.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage rate:

1st	2nd	3rd	4th	5th	6th
50%	55%	60%	65%	75%	85%

Supplemental benefits per hour worked:

1st & 2nd terms	\$ 5.25	\$ 5.30
3rd & 4th terms	5.25	5.30
5th & 6th terms	6.25	6.30

3-4-Bridge, Tunnel, Tank

Painter - Metal Polisher 06/01/2016

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

	07/01/2015	06/01/2016	06/01/2017
Metal Polisher	\$ 28.07	\$ 28.88	\$ 29.73
Metal Polisher**	29.02	29.83	30.68
Metal Polisher***	31.57	32.38	33.23

**Note: Applies on New Construction & complete renovation

*** Note: Applies when working on scaffolds over 34 feet.

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2015	06/01/2016	06/01/2017
Journeyworker:			
All classification	\$ 9.12	\$ 9.26	\$ 9.41

OVERTIME PAY

See (B, E, E2, P, T) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

One (1) year term at the following wage rates:

	07/01/2015	06/01/2016
1st year	\$ 11.75	\$ 11.75
2nd year	13.00	13.00
3rd year	15.75	15.75

Supplemental benefits:

Per hour paid:

1st year	\$ 6.26	\$6.26
2nd year	6.37	6.37
3rd year	6.51	6.51

8-8A/28A-MP

Plumber **06/01/2016**

JOB DESCRIPTION Plumber

DISTRICT 3

ENTIRE COUNTIES

Erie, Niagara, Wyoming

PARTIAL COUNTIES

Allegany: Only the Townships of Allen, Angelica, Belfast, Caneadea, Centerville, Granger, Hume, New Hudson and Rushford

Cattaraugus: Only the Townships of Ashford, Dayton, East Otto, Ellicottville, Farmersville, Franklinville, Freedom, Leon, Lyndon, Machias, Mansfield, New Albion, Otto, Perrysburg, Persia and Yorkshire.

Chautauqua: Only the Townships of Arkwright, Charlotte, Cherry Creek, Hanover, Pomfret, Portland, Ripley, Sheridan, Stockton, Villenova, Westfield, City of Dunkirk and Village of Fredonia.

Genesee: Only the Townships of Alabama, Alexander, Batavia, Darien, Elba, Oakfield, Pembroke and the City of Batavia.

Orleans: Only the Townships of Ridgeway, Shelby and Yates.

WAGES

Per hour:	07/01/2015	05/02/2016 Additional	05/01/2017 Additional	04/30/2018 Additional
Plumber	\$ 33.05*	\$ 1.45	\$ 1.45	\$ 1.45
Steamfitter	33.05*	1.45	1.45	1.45

*Note - Add 10% (ten-percent) to wage when HAZMAT training is required or when OSHA compliant respirator protection is required.

SUPPLEMENTAL BENEFITS

Per hour worked:

\$ 22.56*

* Note - \$2.50 of this amount must be paid at the same premium as the wage.

OVERTIME PAY

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

* Double time after 11 hours per day on Weekdays.

** Double time after 10 hours per day on Saturday.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

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

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following percentage of Journeyman's wage:

1st	2nd	3rd	4th	5th
45%*	55%*	65%*	75%*	90%*

*Note - Add 10% (ten-percent) to wage when HAZMAT training is required or when OSHA compliant respirator protection is required.

Supplemental benefits per hour worked:

\$ 18.49*

* Note - \$2.50 of this amount must be paid at the same premium as the wage.

3-22-Buffalo, Niagara

Roofer **06/01/2016**

JOB DESCRIPTION Roofer

DISTRICT 3

ENTIRE COUNTIES

Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour:	07/01/2015	06/01/2016 Additional
Asbestos Removal	\$ 29.25	\$ 1.00
Slate, Tile	26.40	1.00
Precast tile / slabs	26.40	1.00
Crete / gypsum planks	26.40	1.00
Damp and waterproofer	26.25	1.00
Composition, spayers,	26.25	1.00
Asphalt mastic,	26.25	1.00
Steep roofers	26.25	1.00

SUPPLEMENTAL BENEFITS

Per hour worked:
 \$ 20.72

OVERTIME PAY

See (B, *E, **E2, Q) on OVERTIME PAGE
 * and ** Double time after 8 hours on Saturday.

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

Hour terms at the following percentage of Journeyman's wage:

0 to 1000	to 2000	to 2500	to 3000	to 3500	to 4000	to 4500
50%	55%	60%	65%	70%	75%	80%

Supplemental benefits per hour worked:

0 to 500	to 1000	to 2000	to 2500	to 3000	to 3500	to 4000	to 4500
\$ 0.00	\$ 7.01	\$ 9.80	\$ 15.01	\$ 15.60	\$ 16.18	\$ 16.76	\$ 17.35

3-74

Sheetmetal Worker

06/01/2016

JOB DESCRIPTION Sheetmetal Worker

DISTRICT 3

ENTIRE COUNTIES

Erie, Genesee, Niagara, Orleans, Wyoming

WAGES

Per hour:	07/01/2015	05/15/2016 Additional
Sheet Metal Worker	\$ 33.20	\$ 1.50
Additional \$0.50 per hour for work more than 30' above floor on boatswain chair.		
Additional \$1.00 per hour for work in "Hot" areas of atomic laboratories or plants.		

SUPPLEMENTAL BENEFITS

Per hour worked:
 \$ 21.72*

* Note - \$16.02 of this amount must be paid at the same premium as the wages per overtime hours.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

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

REGISTERED APPRENTICES

Wages per hour:

One year terms at the following wage:

1st term	\$ 14.94
2nd term	19.35
3rd term	20.74

4th term 24.89
 5th term 27.66

Supplemental benefits per hour:

1st term \$ 12.62 Note - \$6.92 of this amount must be paid at the same premium as the wage.
 2nd term 15.37 Note - \$9.67 of this amount must be paid at the same premium as the wage.
 3rd term 19.24 Note - \$13.54 of this amount must be paid at the same premium as the wage.
 4th term 20.07 Note - \$14.37 of this amount must be paid at the same premium as the wage.
 5th term 20.62 Note - \$14.92 of this amount must be paid at the same premium as the wage.

3-71

Sprinkler Fitter 06/01/2016

JOB DESCRIPTION Sprinkler Fitter

DISTRICT 1

ENTIRE COUNTIES

Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orleans, Oswego, Otsego, Schoharie, Schuylar, Seneca, St. Lawrence, Steuben, Tioga, Tompkins, Washington, Wayne, Wyoming, Yates

WAGES

Per hour 07/01/2015
 Sprinkler \$ 31.66
 Fitter

SUPPLEMENTAL BENEFITS

Per hour worked

Journeyman \$ 21.02

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

For Apprentices HIRED PRIOR TO 04/01/2010:

One Half Year terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
50%	50%	55%	60%	65%	70%	75%	80%	85%	90%

Supplemental Benefits per hour worked

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 8.15	\$ 8.15	\$ 15.12	\$ 15.12	\$21.02	\$21.02	\$21.02	\$21.02	\$21.02	\$21.02

For Apprentices HIRED ON OR AFTER 04/01/2010:

One Half Year terms at the following percentage of journeyman's wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
45%	50%	55%	60%	65%	70%	75%	80%	85%	90%

Supplemental Benefits per hour worked

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 8.56	\$ 8.60	\$ 15.37	\$ 15.41	\$ 15.96	\$ 16.00	\$ 16.05	\$ 16.09	\$ 16.14	\$ 16.18

For Apprentices HIRED ON OR AFTER 04/01/2013:

One Half Year terms at the following percentage of journeyman's wage.

1st 45%	2nd 50%	3rd 55%	4th 60%	5th 65%	6th 70%	7th 75%	8th 80%	9th 85%	10th 90%
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Supplemental Benefits per hour worked

1st \$ 7.90	2nd \$ 7.90	3rd \$ 15.12	4th \$ 15.12	5th \$ 15.37	6th \$ 15.37	7th \$ 15.37	8th \$ 15.37	9th \$ 15.37	10th \$ 15.37
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1-669

Teamster - Building / Heavy&Highway **06/01/2016**

JOB DESCRIPTION Teamster - Building / Heavy&Highway **DISTRICT 3**

ENTIRE COUNTIES
 Erie, Niagara

PARTIAL COUNTIES
 Genesee: Only in the Townships of Alabama, Darien and Pembroke.
 Orleans: Only the Townships of Ridgeway, Shelby and Yates.
 Wyoming: Only in the Townships of Arcade, Bennington, Java and Sheldon.

WAGES

GROUP 1: Warehousemen, Yardmen, Truck Helpers, Pickups, Panel Trucks, Flatboy Material Trucks (straight jobs), Single Axle Dump Trucks, Dumpsters, Material Checkers and Receivers, Greasers, Truck Tiremen, Mechanics Helpers and Parts Chasers.

GROUP 2: Tandems and Batch Trucks, Mechanics, Dispatcher.

GROUP 3: Semi-Trailers, Low-Boy Trucks, Asphalt Distributor Trucks and Agitator, Mixer Trucks and dumpcrete type vehicles, Truck Mechanic, Fuel Trucks

GROUP 4: Specialized Earth Moving Equipment, Euclid type, or similar off-highway, where not self-loading, Straddle (Ross) Carrier, and self-contained concrete mobile truck.

GROUP 5: Off-highway Tandem Back-Dump, Twin Engine Equipment and Double-Hitched Equipment where not self-loading.

Per hour:	07/01/2015	07/01/2016	07/01/2017
All GROUPS	\$ 35.15	\$ 36.59	\$ 38.00

Add \$2.00 when required to use personal protection when performing hazardous waste removal work.
 An additional \$1.00 per hour is required when a single irregular work shift starting any time from 5:00PM to 1:00AM is mandated either in the job specification or by the contracting agency.

SUPPLEMENTAL BENEFITS

Per hour worked:	\$ 11.49*	\$ 11.75*	\$ 12.03
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*Note - Only \$ 5.00 per hour needs to be paid for overtime hours.

OVERTIME PAY

See (B, G, P) on OVERTIME PAGE

HOLIDAY

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

3-449

Teamster - Building / Heavy&Highway **06/01/2016**

JOB DESCRIPTION Teamster - Building / Heavy&Highway **DISTRICT 3**

ENTIRE COUNTIES
 Erie, Niagara

PARTIAL COUNTIES
 Genesee: Only in the Townships of Alabama, Darin and Pembroke.
 Orleans: Only the Townships of Ridgeway, Shelby and Yates.
 Wyoming: Only in the Townships of Arcade, Bennington, Java and Sheldon.

WAGES

Per hour:	07/01/2015
Dump Truck Operator*	\$ 18.95

*Does not include Single Axle Dump Trucks (see Teamster Group 1).
 *Does not include Off-highway Dump Trucks (see Teamster Groups 2-5).

SUPPLEMENTAL BENEFITS

Per hour worked:

\$ 1.44

OVERTIME PAY

See (B, J) on OVERTIME PAGE

Note - Time and one half shall be paid for work in excess of five (5) days per week.

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

3-449d-DT

Welder

06/01/2016

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

07/01/2015

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY

HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

- (AA) Time and one half of the hourly rate after 7 and one half hours per day
- (A) Time and one half of the hourly rate after 7 hours per day
- (B) Time and one half of the hourly rate after 8 hours per day
- (B1) Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday.
Double the hourly rate for all additional hours
- (B2) Time and one half of the hourly rate after 40 hours per week
- (C) Double the hourly rate after 7 hours per day
- (C1) Double the hourly rate after 7 and one half hours per day
- (D) Double the hourly rate after 8 hours per day
- (D1) Double the hourly rate after 9 hours per day
- (E) Time and one half of the hourly rate on Saturday
- (E1) Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
- (E2) Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E3) Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
- (E4) Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E5) Double time after 8 hours on Saturdays
- (F) Time and one half of the hourly rate on Saturday and Sunday
- (G) Time and one half of the hourly rate on Saturday and Holidays
- (H) Time and one half of the hourly rate on Saturday, Sunday, and Holidays
- (I) Time and one half of the hourly rate on Sunday
- (J) Time and one half of the hourly rate on Sunday and Holidays
- (K) Time and one half of the hourly rate on Holidays
- (L) Double the hourly rate on Saturday
- (M) Double the hourly rate on Saturday and Sunday
- (N) Double the hourly rate on Saturday and Holidays
- (O) Double the hourly rate on Saturday, Sunday, and Holidays
- (P) Double the hourly rate on Sunday
- (Q) Double the hourly rate on Sunday and Holidays
- (R) Double the hourly rate on Holidays
- (S) Two and one half times the hourly rate for Holidays, if worked

- (S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.
- (T) Triple the hourly rate for Holidays, if worked
- (U) Four times the hourly rate for Holidays, if worked
- (V) Including benefits at SAME PREMIUM as shown for overtime
- (W) Time and one half for benefits on all overtime hours.

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



New York State Department of Labor - Bureau of Public Work
 State Office Building Campus
 Building 12 - Room 130
 Albany, New York 12240

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

This Form Must Be Typed

Submitted By:

(Check Only One)

Contracting Agency Architect or Engineering Firm Public Work District Office Date:

A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address <input type="checkbox"/> (Check if new or change) Telephone: () E-Mail:	2. NY State Units (see Item 5) <table style="width: 100%;"> <tr> <td><input type="checkbox"/> 01 DOT</td> <td><input type="checkbox"/> 07 City</td> </tr> <tr> <td><input type="checkbox"/> 02 OGS</td> <td><input type="checkbox"/> 08 Local School District</td> </tr> <tr> <td><input type="checkbox"/> 03 Dormitory Authority</td> <td><input type="checkbox"/> 09 Special Local District, i.e., Fire, Sewer, Water District</td> </tr> <tr> <td><input type="checkbox"/> 04 State University Construction Fund</td> <td><input type="checkbox"/> 10 Village</td> </tr> <tr> <td><input type="checkbox"/> 05 Mental Hygiene Facilities Corp.</td> <td><input type="checkbox"/> 11 Town</td> </tr> <tr> <td><input type="checkbox"/> 06 OTHER N.Y. STATE UNIT</td> <td><input type="checkbox"/> 12 County</td> </tr> <tr> <td></td> <td><input type="checkbox"/> 13 Other Non-N.Y. State (Describe)</td> </tr> </table>	<input type="checkbox"/> 01 DOT	<input type="checkbox"/> 07 City	<input type="checkbox"/> 02 OGS	<input type="checkbox"/> 08 Local School District	<input type="checkbox"/> 03 Dormitory Authority	<input type="checkbox"/> 09 Special Local District, i.e., Fire, Sewer, Water District	<input type="checkbox"/> 04 State University Construction Fund	<input type="checkbox"/> 10 Village	<input type="checkbox"/> 05 Mental Hygiene Facilities Corp.	<input type="checkbox"/> 11 Town	<input type="checkbox"/> 06 OTHER N.Y. STATE UNIT	<input type="checkbox"/> 12 County		<input type="checkbox"/> 13 Other Non-N.Y. State (Describe)
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<input type="checkbox"/> 06 OTHER N.Y. STATE UNIT	<input type="checkbox"/> 12 County														
	<input type="checkbox"/> 13 Other Non-N.Y. State (Describe)														

3. SEND REPLY TO <input type="checkbox"/> (check if new or change) Name and complete address: Telephone:() E-Mail:	4. SERVICE REQUIRED. Check appropriate box and provide project information. <input type="checkbox"/> New Schedule of Wages and Supplements. <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px 0;">APPROXIMATE BID DATE :</div> <input type="checkbox"/> Additional Occupation and/or Redetermination <div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 2px; width: 45%;">PRC NUMBER ISSUED PREVIOUSLY FOR THIS PROJECT :</div> <div style="border: 1px solid black; padding: 2px; width: 45%;">OFFICE USE ONLY</div> </div>
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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 _____
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7. Nature of Project - Check One: <input type="checkbox"/> 1. New Building <input type="checkbox"/> 2. Addition to Existing Structure <input type="checkbox"/> 3. Heavy and Highway Construction (New and Repair) <input type="checkbox"/> 4. New Sewer or Waterline <input type="checkbox"/> 5. Other New Construction (Explain) <input type="checkbox"/> 6. Other Reconstruction, Maintenance, Repair or Alteration <input type="checkbox"/> 7. Demolition <input type="checkbox"/> 8. Building Service Contract	8. OCCUPATION FOR PROJECT : <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Construction (Building, Heavy Highway/Sewer/Water)</td> <td><input type="checkbox"/> Guards, Watchmen</td> </tr> <tr> <td><input type="checkbox"/> Tunnel</td> <td><input type="checkbox"/> Janitors, Porters, Cleaners, Elevator Operators</td> </tr> <tr> <td><input type="checkbox"/> Residential</td> <td><input type="checkbox"/> Moving furniture and equipment</td> </tr> <tr> <td><input type="checkbox"/> Landscape Maintenance</td> <td><input type="checkbox"/> Trash and refuse removal</td> </tr> <tr> <td><input type="checkbox"/> Elevator maintenance</td> <td><input type="checkbox"/> Window cleaners</td> </tr> <tr> <td><input type="checkbox"/> Exterminators, Fumigators</td> <td><input type="checkbox"/> Other (Describe)</td> </tr> <tr> <td><input type="checkbox"/> Fire Safety Director, NYC Only</td> <td></td> </tr> </table>	<input type="checkbox"/> Construction (Building, Heavy Highway/Sewer/Water)	<input type="checkbox"/> Guards, Watchmen	<input type="checkbox"/> Tunnel	<input type="checkbox"/> Janitors, Porters, Cleaners, Elevator Operators	<input type="checkbox"/> Residential	<input type="checkbox"/> Moving furniture and equipment	<input type="checkbox"/> Landscape Maintenance	<input type="checkbox"/> Trash and refuse removal	<input type="checkbox"/> Elevator maintenance	<input type="checkbox"/> Window cleaners	<input type="checkbox"/> Exterminators, Fumigators	<input type="checkbox"/> Other (Describe)	<input type="checkbox"/> Fire Safety Director, NYC Only	
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<input type="checkbox"/> Exterminators, Fumigators	<input type="checkbox"/> Other (Describe)														
<input type="checkbox"/> Fire Safety Director, NYC Only															

9. Has this project been reviewed for compliance with the Wicks Law involving separate bidding? YES NO

10. Name and Title of Requester _____ Signature _____



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

NOTE: The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = NYS Dept. of Labor; NYC = New York City Comptroller's Office; AG = NYS Attorney General's Office; DA = County District Attorney's Office.

A list of those barred from bidding, or being awarded, any public work contract or subcontract with the State, under section 141-b of the Workers' Compensation Law, may be obtained at the following link, on the NYS DOL Website:

<https://dbr.labor.state.ny.us/EDList/searchPage.do>

NYSDOL Bureau of Public Work Debarment List 04/18/2016

Article 8

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	DOL		4618 FOSTER AVE LLC		C/O KAHAN & KAHAN 225 BROADWAY-SUITE 715NEW YORK NY 10007	02/05/2013	02/05/2018
DOL	DOL	*****0996	A-1 CONSTRUCTION & RENOVATION INC		1973 81ST ST - SUITE A-5 BROOKLYN NY 11214	01/08/2015	01/08/2020
DOL	NYC	*****4486	ABBEY PAINTING CORP		21107 28TH AVENUE BAYSIDE NY 11360	07/02/2012	07/02/2017
DOL	DOL	*****9095	ABDO TILE CO		6179 EAST MOLLOY ROAD EAST SYRACUSE NY 13057	06/25/2010	07/02/2017
DOL	DOL	*****9095	ABDO TILE COMPANY		6179 EAST MOLLOY ROAD EAST SYRACUSE NY 13057	06/25/2010	07/02/2017
DOL	NYC		ABDUL KARIM		C/O NORTH AMERICAN IRON W 1560 DECATUR STREETRIDGWOOD NY 11385	05/15/2015	05/15/2020
DOL	DOL	*****8488	ABELCRAFT OF NEW YORK CORP		640 ASHFORD AVENUE ARDSLEY NY 10502	08/27/2013	08/27/2018
DOL	DOL	*****1219	ABSOLUTE GENERAL CONTRACTING INC		1229 AVENUE U BROOKLYN NY 11229	01/28/2013	01/28/2018
DOL	DOL	*****4539	ACCOMPLISHED WALL SYSTEMS INC		112 OSCAWANA HEIGHTS ROAD PUTNAM VALLEY NY 10542	08/27/2013	08/27/2018
DOL	DOL	*****8018	ACCURATE MECHANICAL LLC		9547 BUSTLETON AVENUE PHILADELPHIA PA 19115	02/05/2014	02/05/2019
DOL	DOL		ACCURATE MECHANICAL OF PHILADELPHIA LLC		9547 BUSTLETON AVENUE PHILADELPHIA PA 19115	02/05/2014	02/05/2019
DOL	DOL	*****3344	ACT INC		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	*****7584	ADAM'S FLOOR COVERING LLC		2718 CURRY ROAD SCHENECTADY NY 12303	07/08/2010	02/15/2017
DOL	DOL		ADESUWA UWJIGBE		P O BOX 21-1022 BROOKLYN NY 11221	05/16/2012	05/16/2017
DOL	NYC		ADRIANA SELA	C/O COLONIAL ROOFING COMPANY INC	247 48TH STREET BROOKLYN NY 11220	02/05/2014	02/05/2019
DOL	DOL	*****6367	ADVANCED METALS		387 RIVERSIDE DRIVE JOHNSON CITY NY 13790	10/01/2012	10/01/2017
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P O BOX 296EAST AURORA NY 14052	07/29/2015	07/29/2020
DOL	DOL	*****2538	AGG MASONRY INC		160 72ND ST - SUITE 721 BROOKLYN NY 11209	03/19/2013	03/19/2018
DOL	DOL		ALBERT CASEY		43-28 54TH STREET WOODSIDE NY 11377	07/01/2011	07/01/2016
DOL	DOL		ALEJANDRO MATOS		C/O SEVEN STAR ELECTRICAL 23-24 STEINWAY STREETASTORIA NY 11105	06/27/2011	06/27/2016
DOL	DOL		ALISHER KARIMOV		C/O AGG MASONRY INC 7105 3RD AVENUEBROOKLYN NY 11209	03/19/2013	03/19/2018
DOL	DOL	*****3344	ALL CATASTROPHE CONSTRUCTION TEAM INC	ACT INC	6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	*****8740	ALLSTATE ENVIRONMENTAL CORP		C/O JOSE MONTAS 27 BUTLER PLACEYONKERS NY 10710	03/18/2011	03/19/2020
DOL	DOL	*****4274	AMERICAN STEEL MECHANICAL INC		693 PAINTER STREET MEDIA PA 19063	02/20/2013	02/20/2018
DOL	NYC		ANDERSON LOPEZ		670 SOUTHERN BLVD BRONX NY 10455	06/14/2011	06/14/2016
DOL	DOL		ANDREW DIPAUL		C/O CONSOLIDATED INDUSTRI 2051 ROUTE 44/55MODENA NY 12548	12/11/2012	12/11/2017
DOL	NYC		ANDRZEJ WROBEL		24 CONGRESS LANE SOUTH RIVER NJ 08882	05/01/2013	05/01/2018
DOL	NYC		ANISUL ISLAM		C/O RELIANCE GENERAL CONS 644 OCEAN PARKWAYBROOKLYN NY 11230	09/02/2015	09/02/2020
DOL	DOL	*****7004	ANNEX CONTRACTING LTD		3005 WYNSUM AVENUE MERRICK NY 11566	08/18/2014	08/18/2019
DOL	DOL	*****7004	ANNEX GENERAL CONTRACTING INC		3005 WYNSUM AVENUE MERRICK NY 11566	08/18/2014	08/18/2019
DOL	DA		ANTHONY CARDINALE		58-48 59TH STREET MASPETH NY 11378	05/16/2012	05/08/2020

NYS DOL Bureau of Public Work Debarment List 04/18/2016

Article 8

DOL	DOL		ANTHONY J MINGARELLI JR		C/O T & T CONCRETE INC 2560 HAMBURG TURNPIKELACKAWANNA NY 14218	07/08/2015	07/08/2020
DOL	DOL	*****3020	APCO CONTRACTING CORP		24 SOUTH MARYLAND AVENUE PORT WASHINGTON NY 11050	09/24/2012	09/02/2020
DOL	DOL	*****3219	APOLLO CONSTRUCTION SERVICES CORP	APOLLO PAINTING CO	157 TIBBETTS ROAD YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL		APOLLO PAINTING CO		157 TIBBETTS ROAD YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL	*****3295	APOLLO PAINTING CORP		3 ALAN B SHEPART PLACE YONKERS NY 10705	03/12/2014	03/12/2019
DOL	AG	*****0194	APPLIED CONSTRUCTION INC		46 RUGBY ROAD WESTBURY NY 11590	11/20/2013	11/20/2018
DOL	NYC	*****8403	AQUA JET PAINTING CORP		10 VIKING DRIVE WEST ISLIP NY 11795	04/16/2014	04/16/2019
DOL	NYC	*****9232	ARKAY CONSTRUCTION INC		102-104 GREYLOCK AVENUE BELLEVILLE NJ 07109	07/15/2015	07/15/2020
DOL	DOL	*****3953	ASCAPE LANDSCAPE & CONSTRUCTION CORP		634 ROUTE 303 BLAUVELT NY 10913	07/26/2012	11/19/2018
DOL	NYC	*****4779	ASTORIA GENERAL CONTRACTING CORP		35-34 31ST STREET LONG ISLAND CITY NY 11106	09/02/2015	09/02/2020
DOL	NYC	*****7217	ASTRO COMMUNICATIONS OF NY CORP		79 ALEXANDER AVE- STE 36A BRONX NY 10454	10/30/2015	10/30/2020
DOL	NYC		AUDLEY O'BRIEN		1273 NORTH AVENUE/#1 CP NEW ROCHELLE NY 10804	04/07/2015	04/07/2020
DOL	DOL		AVIS R HILL		3510 HICKORY WALK LANE ELLENWOOD GA 32094	01/22/2015	01/22/2020
DOL	AG		AVTAR SINGH		116-24 127TH STREET SOUTH OZONE PARK NY 11420	12/22/2015	12/22/2020
DOL	AG		BALDEV SINGH		116-24 127TH STREET SOUTH OZONE PARK NY 11420	12/22/2015	12/22/2020
DOL	DOL		BARBARA CASSIDY		7 BLENIS PLACE VALHALLA NY 10595	04/02/2015	04/02/2020
DOL	DOL		BARRY KINNEY		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	*****2294	BEDELL CONTRACTING CORP		2 TINA LANE HOPEWELL JUNCTION NY 12533	01/06/2012	01/06/2017
DOL	DOL		BEVERLY F WILLIAMS		1238 PRESIDENT STREET BROOKLYN NY 11225	11/18/2013	11/18/2018
DOL	DOL		BIAGIO CANTISANI		200 FERRIS AVENUE WHITE PLAINS NY 10603	12/04/2009	05/04/2017
DOL	NYC	*****6555	BROOKLYN WELDING CORP		1273 NORTH AVENUE/ #1 CP NEW ROCHELLE NY 10804	04/07/2015	04/07/2020
DOL	DOL	*****6156	C & J LANDSCAPING & MAINTENANCE INC		520 PINE HILL ROAD CHESTER NY 10940	06/23/2014	06/23/2019
DOL	DOL		CANTISANI & ASSOCIATES LTD		442 FERRIS AVENUE WHITE PLAINS NY 10603	12/04/2009	05/04/2017
DOL	DOL		CANTISANI HOLDING LLC		220 FERRIS AVENUE WHITE PLAINS NY 10603	05/04/2012	05/04/2017
DOL	DOL		CARIBBEAN POOLS		C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVEBINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****1143	CARMODY BUILDING CORP		442 ARMONK ROAD MOUNT KISCO NY 10549	05/04/2012	05/04/2017
DOL	DOL	*****3368	CARMODY CONCRETE CORP		442 ARMONK ROAD MOUNT KISCO NY 10549	12/04/2009	05/04/2017
DOL	DOL		CARMODY CONTRACTING CORP		220 FERRIS AVENUE WHITE PLAINS NY 10603	05/04/2012	05/04/2017
DOL	DOL	*****6215	CARMODY CONTRACTING INC		220 FERRIS AVENUE WHITE PLAINS NY 10603	05/04/2012	05/04/2017
DOL	DOL		CARMODY ENTERPRISES LTD		220 FERRIS AVENUE WHITE PLAINS NY 10603	12/04/2009	05/04/2017
DOL	DOL	*****3812	CARMODY INC		442 ARMONK ROAD MOUNT KISCO NY 10549	12/04/2009	05/04/2017
DOL	DOL	*****3812	CARMODY INDUSTRIES INC		442 FERRIS AVENUE WHITE PLAINS NY 10603	05/04/2012	05/04/2017
DOL	DOL		CARMODY MAINTENANCE CORP		105 KISCO AVENUE MOUNT KISCO NY 10549	05/04/2012	05/04/2017
DOL	DOL	*****0324	CARMODY MASONRY CORP		442 ARMONK ROAD MOUNT KISCO NY 10549	12/04/2009	05/04/2017
DOL	DOL	*****3812	CARMODY"2" INC		220 FERRIS AVENUE WHITE PLAINS NY 10603	12/04/2009	05/04/2017

NYSDOL Bureau of Public Work Debarment List 04/18/2016

Article 8

DOL	NYC	*****9172	CASSIDY EXCAVATING INC		14 RAILROAD AVENUE VALHALLA NY 10595	05/15/2014	04/02/2020
DOL	DOL	*****1683	CATONE CONSTRUCTION COMPANY INC		294 ALPINE ROAD ROCHESTER NY 14423	03/09/2012	03/09/2017
DOL	DOL		CATONE ENTERPRISES INC		225 DAKOTA STREET ROCHESTER NY 14423	03/09/2012	03/09/2017
DOL	DOL	*****6745	CATSKILL FENCE INSTALLATIONS INC		5445 ROUTE 32 CATSKILL NY 12414	08/22/2014	08/22/2019
DOL	DOL	*****8530	CAZ CONTRACTING CORP		37-11 35TH AVENUE LONG ISLAND CITY NY 11101	08/26/2013	08/26/2018
DOL	DOL	*****5556	CERTIFIED INSTALLERS INC		113 N MAPLE AVENUE GREENSBURG PA 15601	02/21/2013	02/21/2018
DOL	DOL	*****7655	CHAMPION CONSTRUCTION SERVICES CORP		2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	NYC		CHARLES CASSIDY JR		14 RAILROAD AVENUE VALHALLA NY 10595	05/15/2014	04/02/2020
DOL	DOL	*****1416	CHEROMINO CONTROL GROUP LLC		61 WILLET ST - SUITE 14 PASSAIC NJ 07055	12/03/2009	02/23/2017
DOL	DOL		CHRIS SAVOURY		44 THIELLS-MT IVY ROAD POMONA NY 10970	10/14/2011	10/14/2016
DOL	DOL		CHRISTINE J HEARNE		C/O C.J-HEARNE CONSTRUCTIO 131 PONCE DE LEON AVE NEATLANTA GA 30308	12/01/2015	12/01/2020
DOL	DOL		CHRISTOF PREZBYL		2 TINA LANE HOPEWELL JUNCTION NY 12533	01/06/2012	01/06/2017
DOL	DOL	*****3360	CITY LIMITS GROUP INC		2279 HOLLERS AVENUE BRONX NY 10475	01/07/2014	06/23/2019
DOL	DOL	*****0671	CJ-HEARNE CONSTRUCTION CO		SUITE 204 131 PONCE DE LEON AVENUEATLANTA GA 30308	12/01/2015	12/01/2020
DOL	NYC	*****2905	COLONIAL ROOFING COMPANY INC		247 48TH STREET BROOKLYN NY 11220	02/05/2014	02/05/2019
DOL	NYC	*****3182	COLORTECH INC		5980 58TH AVENUE MASPETH NY 11378	11/18/2013	11/18/2018
DOL	DOL	*****2703	CONKLIN'S TECH- MECHANICAL INC		5 PARKER AVENUE POUGHKEEPSIE NY 12601	03/25/2014	03/25/2019
DOL	DOL	*****4175	CONSOLIDATED INDUSTRIAL SERVICES INC		2051 ROUTE 44/55 MODENA NY 12548	12/11/2012	01/28/2018
DOL	DOL		CONSTANTINOS ZERVAS		37-11 35TH AVENUE LONG ISLAND CITY NY 11101	08/26/2013	08/26/2018
DOL	DOL	*****5740	CORTLAND GLASS COMPANY INC		336 TOMPKINS STREET CORTLAND NY 13045	10/21/2010	07/15/2016
DOL	NYC	*****4468	CRAFT CONTRACTING GROUP INC		3256 BRUNER AVENUE BRONX NY 10469	07/29/2014	07/29/2019
DOL	NYC	*****8507	CRAFT FENCE INC		3256 BRUNER AVENUE BRONX NY 10469	07/29/2014	07/29/2019
DOL	NYC	*****2164	CREATIVE TRUCKING INC		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	DOL	*****0810	D & G PAINTING & DECORATING INC		53 LITTLE COLLABAR ROAD MONTGOMERY NY 12549	04/19/2012	04/19/2017
DOL	DOL	*****7761	D L MALARKEY CONSTRUCTION		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****7888	D L MALARKEY CONSTRUCTION INC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****5629	DAKA PLUMBING AND HEATING LLC		2561 ROUTE 55 POUGHQUAG NY 12570	02/19/2016	02/19/2021
DOL	DOL		DARYL T RIEKS		C/O RIEKS CONTRACTING LLC 4804 GAHWILER ROADAUBURN NY 13021	05/01/2015	05/01/2020
DOL	DOL		DAVID MARTINEZ		C/O EMPIRE TILE INC 6 TREMONT COURTHUNTINGTON STATION NY 11746	03/08/2016	03/08/2021
DOL	NYC		DAWN AVILA AKA DAWN BECHTOLD		1ST FLOOR STORE FRONT 88-10 LITTLE NECK PARKWAYFLORAL PARK NY 11001	06/24/2014	06/24/2019
DOL	NYC		DAWN BECHTOLD AKA DAWN AVILA		1ST FLOOR STORE FRONT 88-10 LITTLE NECK PARKWAYFLORAL PARK NY 11001	06/24/2014	06/24/2019
DOL	DOL		DEAN ROBBINS III		212 OXFORD WAY SCHENECTADY NY 12309	12/11/2012	09/16/2018
DOL	NYC	*****3865	DECOMA BUILDING CORPORATION		134 EVERGREEN PL/STE 101 EAST ORANGE NJ 07018	12/30/2013	12/30/2018

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DOL	DOL		DEDA GAZIVODAN		C/O DAKA PLUMBING AND H 2561 ROUTE 55POUGHQUAG NY 12570	02/19/2016	02/19/2021
DOL	DOL	*****1446	DELTA CONTRACTING PAINTING AND DECORATING INC		437 SUNRISE HIGHWAY WEST BABYLON NY 11707	08/12/2013	08/12/2018
DOL	DOL	*****3538	DELTA CONTRACTING PAINTING AND DESIGN INC		75 MCCULLOCH DRIVE DIX HILLS NY 11746	10/19/2010	08/12/2018
DOL	DOL		DEMETRIOS KOUTSOURAS		530 BEECH STREET NEW HYDE PARK NY 11040	07/02/2012	07/02/2017
DOL	DOL	*****9868	DESANTIS ENTERPRISES		161 OSWEGO RIVER ROAD PHOENIX NY 13135	09/24/2013	11/18/2018
DOL	NYC	*****8234	DEWATERS PLUMBING AND HEATING LLC		30 COLUMBUS CIRCLE EASTCHESTER NY 10709	08/21/2012	08/21/2017
DOL	DOL	*****9252	DI BERNARDO TILE AND MARBLE CO INC		15 WALKER WAY ALBANY NY 12205	03/21/2014	03/21/2019
DOL	DOL		DIANE DEAVER		731 WARWICK TURNPIKE HEWITT NJ 07421	06/25/2012	12/11/2017
DOL	NYC		DIMITRIOS KOUTSOUKOS		C/O ASTORIA GENERAL CONTR 35-34 31ST STREETLONG ISLAND CITY NY 11106	09/02/2015	09/02/2020
DOL	DOL		DORIS SKODA		C/O APCO CONTRACTING CORP 24 SOUTH MARYLAND AVENUEPORT WASHINGTON NY 11050	09/24/2012	09/02/2020
DOL	NYC	*****7404	DOSANJH CONSTRUCTION CORP		9439 212TH STREET QUEENS VILLAGE NY 11428	02/25/2016	02/25/2021
DOL	DOL		DOUGLAS L MALARKEY	MALARKEY CONSTRUCTI ON	64 VICTORIA DRIVE B INGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****6982	DUFOUR GROUP INC	DUFOUR MASONRY	353 WEST 56TH STREET #7M NEW YORK NY 10019	06/10/2014	06/10/2019
DOL	DOL		DUFOUR MASONRY		353 WEST 56TH ST #7M NEW YORK NY 10019	06/10/2014	06/10/2019
DOL	DOL		DUFOUR MASONRY & RESTORATION INC		353 WEST 56TH STREET #7M NEW YORK NY 10019	06/10/2014	06/10/2019
DOL	DOL	*****5840	DYNA CONTRACTING INC		363 88TH STREET BROOKLYN NY 11209	11/18/2013	11/18/2018
DOL	DOL		E C WEBB		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL		EARL GALBREATH		640 ASHFORD AVENUE ARDSLEY NY 10502	08/27/2013	08/27/2018
DOL	DOL		EARL L WILSON	WILSON BROTHER DRYWALL CONTRACTOR S	36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL	*****1496	EAST COAST DRYWALL INC		1238 PRESIDENT STREET BROOKLYN NY 11225	11/18/2013	11/18/2018
DOL	DOL	*****8011	EOCA CLEANING CONTRACTORS INC		P O BOX 21-1022 BROOKLYN NY 11221	05/16/2012	05/16/2017
DOL	NYC	*****8074	ECONOMY IRON WORKS INC		670 SOUTHERN BLVD BRONX NY 10455	06/14/2011	06/14/2016
DOL	DOL		EDWARD L GAUTHIER		C/O IMPERIAL MASONRY REST 141 ARGONNE DRIVEKENMORE NY 14217	10/03/2012	10/03/2017
DOL	NYC		EDWARD MENKEN		C/O AQUA JET PAINTING 10 VIKING DRIVEWEST ISLIP NY 11795	04/16/2014	04/16/2019
DOL	NYC	*****0900	EF PRO CONTRACTING INC		147 BROOME AVENUE ATLANTIC BEACH NY 11509	03/03/2014	03/03/2019
DOL	NYC		EFSTRATIOS BERNARDIS		23-73 48TH STREET LONG ISLAND CITY NY 11103	04/24/2014	04/24/2019
DOL	NYC	*****6260	EL TREBOL SPECIAL CLEANING INC		95-26 76TH STREET OZONE PARK NY 11416	10/12/2011	10/12/2016
DOL	DOL		ELIZABETH RAMADANI		C/O RAMADA CONSTRUCTION 80 SAVO LOOPSTATEN ISLAND NY 10309	01/07/2014	01/07/2019
DOL	DOL		ELLEN DESANTIS	DESANTIS ENTERPRISES	161 OSWEGO RIVER ROAD PHOENIX NY 13135	09/24/2013	11/18/2018
DOL	DOL	*****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	AG		EMILIO FRANZA		90 JUNIUS STREET BROOKLYN NY 11212	01/23/2014	01/23/2019
DOL	DOL		EMPIRE CONCRETE SERVICES LLC		101 SULLYS TRAIL/SUITE 20 PITTSFORD NY 14534	11/18/2013	01/07/2019

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DOL	DOL	*****0511	EMPIRE CONCRETE SYSTEMS LLC		101 SULLYS TRAIL/ SUITE 2 PITTSFORD NY 14534	11/18/2013	01/07/2019
DOL	DOL	*****2353	EMPIRE CONSTRUCTORS LLC		101 SULLYS TRAIL/SUITE 20 PITTSFORD NY 14534	11/18/2013	01/07/2019
DOL	DOL		EMPIRE PRECAST LLC		101 SULLYS TRAIL/SUITE 20 PITTSFORD NY 14534	11/18/2013	01/07/2019
DOL	DOL	*****3270	EMPIRE TILE INC		6 TREMONT COURT HUNTINGTON STATION NY 11746	03/08/2016	03/08/2021
DOL	DOL		ERIKA BARNETT		253 BEACH BREEZE LANE UNIT BARVERNE NY 11692	02/05/2013	02/05/2018
DOL	DOL		ESTEVEES & FRAGA CONSTRUCTION CO INC		986 MADISON AVENUE PATERSON NJ 07501	01/03/2013	01/03/2018
DOL	DOL		ESTEVEES & FRAGA INC		986 MADISON AVENUE PATERSON NJ 07501	01/03/2013	01/03/2018
DOL	DOL		EVELIO ELLEDIAS		114 PEARL STREET PORT CHESTER NY 10573	08/15/2012	08/15/2017
DOL	NYC		EVERTON CARLESS		134 EVERGREEN PL/STE 101 EAST ORANGE NJ 07018	12/30/2013	12/30/2018
DOL	DOL		F KALAFATIS		2279 HOLLERS AVENUE BRONX NY 10475	01/07/2014	06/23/2019
DOL	DOL		FANTASTIC PAINTING		493 LANSING ROAD FULTONVILLE NY 12072	11/18/2013	11/18/2018
DOL	DOL		FAY MATTHEW		C/O CHAMPION CONSTRUCTION 2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL		FAZIA GINA ALI-MOHAMMED	C/O CHAMPION CONSTRUCTI ON	2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	DOL	*****5867	FJM-FERRO INC		6820 14TH AVENUE BROOKLYN NY 11219	10/27/2011	10/27/2016
DOL	DOL	*****1311	FLOZ-ON PAINTING & DECORATING INC		12 DUNDERBERG ROAD TOMKINS NY 10986	10/16/2013	10/16/2018
DOL	DOL	*****8961	FLOZ-ON PAINTING INC		12 DUNDERBERG ROAD TOMKINS NY 10986	10/16/2013	10/16/2018
DOL	DOL		FMS		4 LEGHORN COURT NEW YORK NY 11746	11/28/2012	11/28/2017
DOL	DOL	*****8067	FORTH SPORT FLOORS INC		P O BOX 74 EAST GREENBUSH NY 12061	02/28/2012	10/01/2017
DOL	DOL		FRAN MICELI		2279 HOLLERS AVENUE BRONX NY 10475	01/07/2014	06/23/2019
DOL	DOL		FRANCES KALAFATIS		2279 HOLLERS AVENUE BRONX NY 10475	01/07/2014	06/23/2019
DOL	DOL		FRANCES KALAFATIS-MICELI		2279 HOLLERS AVENUE BRONX NY 10475	01/07/2014	06/23/2019
DOL	DOL		FRANK J MERCANDO		134 MURRAY AVENUE YONKERS NY 10704	12/11/2009	02/03/2019
DOL	DOL		FRANK MICELI JR	C/O FRANK MICELI JR CONTRACTIN G INC	19 CLIFF STREET NEW ROCHELLE NY 10801	10/16/2013	10/16/2018
DOL	DOL	*****1321	FRANK MICELI JR CONTRACTING INC		19 CLIFF STREET NEW ROCHELLE NY 10801	10/16/2013	10/16/2018
DOL	DOL		FRED ABDO	ABDO TILE COMPANY AKA ABDO TILE CO	6179 EAST MOLLOY ROAD EAST SYRACUSE NY 13057	06/25/2010	07/02/2017
DOL	DOL	*****2724	FRESH START PAINTING CORP		157 TIBBETS ROAD YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL		G FUCCI CONSTRUCTION SERVICES		3 ALAN B SHEPARD PLACE YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL	*****6767	G FUCCI PAINTING INC		C/O SPIEGEL & UTRERA 1 MAIDEN LANE - 5TH FL NEW YORK NY 10038	03/12/2014	03/12/2019
DOL	DOL	*****4546	GAF PAINTING LLC		157 TIBBETS ROAD YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL		GARDEN STATE PAINTING		157 TIBBETS ROAD YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL		GARY MCDOWELL	GM CONSTRUCTI ON & LAWN CARE SERVICE	76 PLEASANT STREET WELLSVILLE NY 14895	06/11/2013	06/11/2018
DOL	DOL		GEORGE DI BERNARDO		C/O DI BERNARDO TILE 15 WALKER WAY ALBANY NY 12205	03/21/2014	03/21/2019

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DOL	NYC		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DOL		GERALD A POLLOCK		336 TOMPKINS STREET CORTLAND NY 13045	06/29/2010	07/15/2016
DOL	DOL	*****1075	GLOBAL TANK CONSTRUCTION LLC		P O BOX 1238 SALINA OK 74365	11/28/2012	11/28/2017
DOL	DOL	*****0878	GM CONSTRUCTION & LAWN CARE SERVICE		76 PLEASANT STREET WELLSVILLE NY 14895	06/11/2013	06/11/2018
DOL	DOL	*****0090	GOLDS FLOORING INSTALLATIONS INC		25 HAMILTON ROAD MONTICELLO NY 12701	10/16/2013	10/16/2018
DOL	DOL		GREGORY A FUCCI		C/O PAF PAINTING SERVICES 157 TIBBETTS ROADYONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL		GREGORY FUCCI JR		C/O APOLLO CONSTRUCTION 157 TIBBETTS ROADYONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL		GRETCHEN SULLIVAN		P O BOX 130 CRETE IL 60417	11/10/2011	11/10/2016
DOL	DOL	*****7735	GRYF CONSTRUCTION INC		394 SPOTSWOOD-ENGLISH RD MONROE NJ 08831	08/08/2011	08/08/2016
DOL	DOL	*****9456	GUILLO CONTRACTING CORP		P O BOX 229 CALVERTON NY 11933	07/08/2013	07/08/2018
DOL	DOL		GUS PAPASTEFANOU		C/O D & G PAINTING & DECO 53 LITTLE COLLABAR ROADMONTGOMERY NY 12549	04/19/2012	04/19/2017
DOL	NYC	*****0346	H N H CONTRACTORS CORP		4558 BROADWAY # 6 NEW YORK NY 10040	08/04/2014	08/04/2019
DOL	DOL		HALSSAM FOSTOK		5 HANSEN PLACE WAYNE NJ 07470	09/18/2013	09/18/2018
DOL	NYC		HAMEEDUL HASAN		240 HOME STREET TEANECK NJ 07666	08/04/2014	08/04/2019
DOL	AG	*****9918	HARA ELECTRIC CORP		2461 47TH STREET ASTORIA NY 11103	09/26/2013	09/26/2018
DOL	DOL	*****5405	HARD LINE CONTRACTING INC		89 EDISON AVENUE MOUNT VERNON NY 10550	10/28/2011	10/28/2016
DOL	NYC		HARMEL SINGH		15 CLINTON LANE HICKSVILLE NY 11801	02/25/2016	02/25/2021
DOL	NYC		HAROLD KUEMMEL		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	AG		HARVINDER SINGH PAUL		90 JUNIUS STREET BROOKLYN NY 11212	01/23/2014	01/23/2019
DOL	DOL		HENRY VAN DALRYMPLE		2663 LANTERN LANE ATLANTA GA 30349	12/01/2015	12/01/2020
DOL	DOL		HI-TECH CONTRACTING CORP		114 PEARL STREET PORT CHESTER NY 10573	08/15/2012	08/15/2017
DOL	DOL	*****6370	HILLIANO CONSTRUCTION & ELECTRICAL INC		354 MAGNOLIA STREET ROCHESTER NY 14611	01/22/2015	01/22/2020
DOL	DOL	*****8282	IDEMA DEVELOPMENT INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL	*****8282	IDEMA GENERAL CONTRACTORS INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL	*****8426	IMPERIAL MASONRY RESTORATION INC		141 ARGONNE DRIVE KENMORE NY 14217	10/03/2012	10/03/2017
DOL	DOL	*****7001	INTEGRATED CONSTRUCTION & POWER SYSTEMS INC		SUITE 100 2105 W GENESEE STREETS YRACUSE NY 13219	01/06/2016	01/06/2021
DOL	DOL		ISABEL FRAGA		C/O THREE FRIENDS CONSTR 986 MADISON AVENUE PATERSON NJ 07501	01/03/2013	01/03/2018
DOL	AG	*****0000	J A M CONSTRUCTION CORP		SUITE 125 265 SUNRISE HIGHWAY ROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	DOL	*****7598	J M RICH LLC		P O BOX 268 STILLWATER NY 12170	09/16/2013	03/21/2019
DOL	DOL	*****3478	J N P CONSTRUCTION CORP		50 LOUIS COURT P O BOX 1907 SOUTH HACKENSACK NY 07606	03/21/2014	03/21/2019
DOL	DOL		J N RICH LLC		P O BOX 268 STILLWATER NY 12170	09/16/2013	03/21/2019
DOL	DOL	*****9368	J TECH CONSTRUCTION		PO BOX 64782 ROCHESTER NY 14624	09/24/2012	09/24/2017
DOL	DOL		J THE HANDYMAN			09/24/2012	09/24/2017
DOL	DOL	*****4910	J V MAGIC TOUCH CORPORATION		94-25 57TH AVENUE, APT 5G ELMHURST NY 11373	01/12/2015	01/12/2020

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DOL	DOL		JACQUELINE HOWE		C/O FLOZ-ON PAINTING INC 12 DUNDERBERG ROADTOMKINS NY 10986	10/16/2013	10/16/2018
DOL	DOL	*****8627	JAG I LLC		635 LUZERNE ROAD QUEENSBURY NY 12804	09/16/2013	09/16/2018
DOL	DOL	*****2868	JAG INDUSTRIES INC		175 BROAD ST - SUITE 320 GLENS FALLS NY 12801	09/16/2013	09/16/2018
DOL	DOL		JAMES B RHYNDERS		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		JAMES BOYCE		C/O EMPIRE CONCRETE SYST 101 SULLYS TRAIL/SUITE 20PITTSFORD NY 14534	11/18/2013	01/07/2019
DOL	DOL		JAMES E RHYNDERS		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	AG		JAMES FALCONE		SUITE 125 265 SUNRISE HIGHWAYROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	DOL		JAMES RHYNDERS SR		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL		JAMES SICKAU		3090 SHIRLEY ROAD NORTH COLLINS NY 14111	04/19/2011	07/08/2020
DOL	DOL		JAMES WALSH		89 EDISON AVENUE MOUNT VERNON NY 10550	10/28/2011	10/28/2016
DOL	DOL		JASON M RICH		P O BOX 268 STILLWATER NY 12170	09/16/2013	03/21/2019
DOL	DOL		JASON W MILLIMAN		C/O ROCHESTER ACOUSTICAL P O BOX 799HILTON NY 14468	02/19/2016	02/19/2021
DOL	DOL		JAY PRESUTTI		C/O CONSOLIDATED INDUSTRI 2051 ROUTE 44/55MODENA NY 12548	01/28/2013	01/28/2018
DOL	DOL		JEFF P BRADLEY		520 PINE HILL ROAD CHESTER NY 10940	06/23/2014	06/23/2019
DOL	NYC		JEFFREY CASSIDY		14 RAILROAD AVENUE VALHALLA NY 10595	05/15/2014	04/02/2020
DOL	DOL		JERALD HOWE		C/O FLOZ-ON PAINTING INC 12 DUNDERBERG ROADTOMKINS NY 10986	10/16/2013	10/16/2018
DOL	DOL		JEROME LACITIGNOLA		C/O CATSKILL FENCE INSTAL 5445 ROUTE 32 CATSKILL NY 12414	08/22/2014	08/22/2019
DOL	NYC		JERRY DEWATERS		30 COLUMBUS CIRCLE EASTCHESTER NY 10709	08/21/2012	08/21/2017
DOL	DOL		JOHN CATONE		C/O CATONE CONSTRUCTION 294 ALPINE ROADROCHESTER NY 14612	03/09/2012	03/09/2017
DOL	DOL		JOHN DESCUL		437 SUNRISE HIGHWAYA WEST BABYLON NY 11704	08/12/2013	08/12/2018
DOL	DOL		JOHN H LEE	JOHN LEE QUALITY PAVING	67 WILER ROAD HILTON NY 14468	01/28/2013	01/28/2018
DOL	DOL	*****1749	JOHN LEE QUALITY PAVING		67 WILER ROAD HILTON NY 14468	01/28/2013	01/28/2018
DOL	DOL		JON E DEYOUNG		261 MILL ROAD P O BOX 296EAST AURORA NY 14052	07/29/2015	07/29/2020
DOL	DOL	*****9368	JORGE I DELEON	J TECH CONSTRUCTI ON	PO BOX 64782 ROCHESTER NY 14624	09/24/2012	09/24/2017
DOL	DOL		JORGE OUVINA		344 SOUNDVIEW LANE COLLEGE POINT NY 11356	11/22/2011	11/22/2016
DOL	DOL		JORGE VILLALOBOS		94-25 57TH AVENUE - APT 5 ELMHURST NY 11373	01/12/2015	01/12/2020
DOL	DOL		JOSE MONTAS		27 BUTLER PLACE YONKERS NY 10710	03/18/2011	03/19/2020
DOL	DOL		JOSEPH CASUCCI		6820 14TH AVENUE BROOKLYN NY 11219	10/27/2011	10/27/2016
DOL	AG		JOSEPH FALCONE		SUITE 125 265 SUNRISE HIGHWAYROCKVILLE CENTRE NY 10457	04/07/2016	04/07/2021
DOL	DOL		JOSEPH MARTONE		112 OSCAWANA HEIGHTS ROAD PUTNAM VALLEY NY 10542	08/27/2013	08/27/2018
DOL	DOL		JOSHUA DEBOWSKY		9547 BUSTLETON AVENUE PHILADELPHIA PA 19115	02/05/2014	02/05/2019
DOL	DOL		JOYA MUSCOLINO		10 ST CHARLES STREET THORNWOOD NY 10594	09/03/2013	09/03/2018

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DOL	DOL		JUANA MARTINEZ		C/O LEAD CONSTRUCTION 27 BUTLER PLACE YONKERS NY 10710	03/19/2015	03/19/2020
DOL	DOL	****4340	JUBCO SITE DEVELOPMENT LLC		462 LAKEVIEW AVENUE VALHALLA NY 10595	12/16/2013	12/16/2018
DOL	DOL		JULIUS AND GITA BEHREND		5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002
DOL	DOL		KAREN HARTMAN		C/O GUILLO CONTRACTING P O BOX 229 CALVERTON NY 11933	07/08/2013	07/08/2018
DOL	NYC		KATHLEEN SELA	C/O COLONIAL ROOFING COMPANY INC	247 48TH STREET BROOKLYN NY 11220	02/05/2014	02/05/2019
DOL	DOL		KEITH SCHEPIS		C/O KJS HAULING AND HOME 95 MAPLE AVENUE NEW CITY NY 10956	04/15/2013	04/15/2018
DOL	DOL		KEN DEAVER		731 WARWICK TURNPIKE HEWITT NJ 07421	06/25/2012	12/11/2017
DOL	DOL		KEVIN BABCOCK JR		P O BOX 46 THOMPSON RIDGE NY 10985	08/22/2014	08/22/2019
DOL	DOL		KEVIN M BABCOCK		P O BOX 46 THOMPSON RIDGE NY 10985	08/22/2014	08/22/2019
DOL	DOL		KIM SOROCENSKI		C/O SOLUTION MATTERS INC 198 NORWOOD ROADPORT JEFFERSON NY 11776	11/19/2015	11/19/2020
DOL	DOL	****2463	KJS HAULING AND HOME IMPROVEMENT INC		95 MAPLE AVENUE NEW CITY NY 10956	04/15/2013	04/15/2018
DOL	AG		KOSTAS "GUS" ANDRIKOPOULOS		2461 47TH STREET ASTORIA NY 11103	09/26/2013	09/26/2018
DOL	DOL		KRZYSZTOF PRXYBYL		2 TINA LANE HOPEWELL JUNCTION NY 12533	01/06/2012	01/06/2017
DOL	DOL	****6033	KUSNIR CONSTRUCTION		2677 ANAWALK ROAD KATONAH NY 10536	08/03/2012	08/03/2017
DOL	DOL	****0526	LAGUARDIA CONSTRUCTION CORP		47-40 48TH STREET WOODSIDE NY 11377	07/01/2011	07/01/2016
DOL	NYC	****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL	****6224	LAKESIDE FIRE SPRINKLERS LLC		125 CHAUTAUQUA AVENUE LAKEWOOD NY 14750	06/24/2015	06/24/2020
DOL	DOL		LARRY DOMINGUEZ		114 PEARL STREET PORT CHESTER NY 10573	08/15/2012	08/15/2017
DOL	DOL		LAURA A. GAUTHIER		C/O IMPERIAL MASONRY REST 141 ARGONNE DRIVEKENMORE NY 14217	10/03/2012	10/03/2017
DOL	DOL		LAURI MARTONE		112 OSCAWANA HEIGHTS ROAD PUTNAM VALLEY NY 10542	08/27/2013	08/27/2018
DOL	DOL		LAVERN GLAVE		C/O RAW POWER ELECTRIC 3 PARK CIRCLE MIDDLETOWN NY 10940	09/15/2014	09/15/2019
DOL	DOL		LAWRENCE J RUGGLES		P O BOX 371 ROUND LAKE NY 12151	05/12/2014	05/12/2019
DOL	DOL	****1364	LEAD CONSTRUCTION SERVICES INC		3 ALAN B SHEPARD PLACE YONKERS NY 10705	03/19/2015	03/19/2020
DOL	DOL	****0597	LEED INDUSTRIES CORP	HI-TECH CONTRACTIN G CORP	114 PEART STREET PORT CHESTER NY 10573	08/15/2012	08/15/2017
DOL	AG		LEONID FRIDMAN		APT 5 200 BRIGHTON, 15TH STBROOKLYN NY 11235	01/23/2013	01/23/2019
DOL	DOL		LINDSEY R CRILL		143 FILLMORE AVENUE BUFFALO NY 14210	01/08/2015	01/08/2020
DOL	DOL	****8453	LINPHILL ELECTRICAL CONTRACTORS INC		523 SOUTH 10TH AVENUE MOUNT VERNON NY 10553	01/07/2011	04/15/2018
DOL	DOL		LINVAL BROWN		523 SOUTH 10TH AVENUE MOUNT VERNON NY 10553	01/07/2011	04/15/2018
DOL	NYC	****2850	M A 2 FLAGS CONTRACTING CORP		25-18 100TH STREET EAST ELMHURST NY 11369	08/21/2013	08/21/2018
DOL	AG	****6957	M B DIN CONSTRUCTION INC		8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214	11/17/2015	11/17/2020
DOL	NYC	****6317	M S QUALITY CONSTRUCTION LLC		27 MAPLEWOOD AVENUE COLONIA NJ 07067	02/04/2015	02/04/2020
DOL	NYC		MACIEJ SONTOWSKI		27 MAPLEWOOD AVENUE COLONIA NJ 07067	02/04/2015	02/04/2020
DOL	NYC	****9590	MACK GLASSNAUTH IRON WORKS INC		137 LIBERTY AVENUE BROOKLYN NY 11212	12/21/2015	12/21/2020

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DOL	NYC	*****3141	MACKEY REED ELECTRIC INC		1ST FLOOR STORE FRONT 88-10 LITTLE NECK PARKWAY FLORAL PARK NY 11001	06/24/2014	06/24/2019
DOL	DOL		MALARKEY'S BAR & GRILL LLC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL	*****0705	MALARKEY'S PUB & GRUB LLC		64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	NYC		MANUEL P TOBIO		150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	NYC		MANUEL TOBIO		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL		MAR CONTRACTING CORP		620 COMMERCE STREET THORNWOOD NY 10594	09/24/2012	09/24/2017
DOL	DOL		MARGARET FORTH		P O BOX 74 EAST GREENBUSH NY 12061	02/28/2012	10/01/2017
DOL	DOL		MARIA ESTEVES AKA MARIA MARTINS		C/O THREE FRIENDS CONSTR 986 MADISON AVENUE PATERSON NJ 07501	01/03/2013	01/03/2018
DOL	DOL		MARIA MARTINS AKA MARIA ESTEVES		C/O THREE FRIENDS CONSTR 986 MADISON AVENUE PATERSON NJ 07501	01/03/2013	01/03/2018
DOL	DOL		MARIACHI'S PIZZERIA		C/O DOUGLAS L MALARKEY 64 VICTORIA DRIVE BINGHAMTON NY 13904	02/04/2016	02/04/2021
DOL	DOL		MARIO LUIS		31 DURANT AVENUE BETHEL CT 06801	07/02/2012	07/02/2017
DOL	DOL		MARK MIONIS		6409 LAND O LAKES BLVD LAND O LAKES FL 34638	11/10/2015	11/10/2020
DOL	DOL	*****5533	MARQUISE CONSTRUCTION & DEVELOPMENT CORP		10 ST CHARLES STREET THORNWOOD NY 10594	09/03/2013	09/03/2018
DOL	DOL	*****8810	MARQUISE CONSTRUCTION ASSOCIATES INC		20 BOSWELL ROAD PUTNAM VALLEY NY 10579	09/03/2013	09/03/2018
DOL	DOL	*****1134	MARQUISE CONSTRUCTION CORP		10 ST CHARLES STREET THORNWOOD NY 10594	09/03/2013	09/03/2018
DOL	NYC	*****4314	MASCON RESTORATION INC		129-06 18TH AVENUE COLLEGE POINT NY 11356	02/09/2012	02/09/2017
DOL	NYC	*****4314	MASCON RESTORATION LLC		129-06 18TH AVENUE COLLEGE POINT NY 11356	02/09/2012	02/09/2017
DOL	DOL	*****0845	MASONRY CONSTRUCTION INC		442 ARMONK ROAD MOUNT KISCO NY 10549	12/04/2009	05/04/2017
DOL	DOL	*****3333	MASONRY INDUSTRIES INC		442 ARMONK ROAD MOUNT KISCO NY 10549	12/04/2009	05/04/2017
DOL	DOL		MATTHEW IDEMA GENERAL CONTRACTORS INC		91 COLLEGE AVENUE POUGHKEEPSIE NY 12603	12/04/2015	12/04/2020
DOL	DOL	*****9857	MBL CONTRACTING CORPORATION		2620 ST RAYMOND AVENUE BRONX NY 10461	08/30/2011	08/30/2016
DOL	DOL	*****9028	MCINTOSH INTERIORS LLC		8531 AVENUE B BROOKLYN NY 11236	02/05/2013	02/05/2018
DOL	DOL	*****4259	MERCANDO CONTRACTING CO INC		134 MURRAY AVENUE YONKERS NY 10704	12/11/2009	02/03/2019
DOL	DOL	*****0327	MERCANDO INDUSTRIES LLC		134 MURRAY AVENUE YONKERS NY 10704	12/11/2009	02/03/2019
DOL	NYC	*****5330	METRO DUCT SYSTEMS INC		1219 ASTORIA BOULEVARD LONG ISLAND CITY NY 11102	04/16/2014	11/19/2020
DOL	DOL	*****3368	MICEK CONSTRUCTION CO INC		20 CROSS STREET FALCONER NY 14733	12/02/2014	12/02/2019
DOL	DOL		MICHAEL A PASCARELLA		SUITE 100 2105 WEST GENESEE STREET SYRACUSE NY 13219	01/06/2016	01/06/2021
DOL	DOL	*****9198	MICHAEL CZECHOWICZ	OCTAGON CO	37-11 35TH AVENUE-2ND FL LONG ISLAND CITY NY 11101	01/08/2013	01/08/2018
DOL	DOL		MICHAEL F LEARY JR		3813 SNOWDEN HILL ROAD NEW HARTFORD NY 13413	06/19/2013	06/19/2018
DOL	DOL		MICHAEL F LEARY JR METAL STUD & DRYWALL		3813 SNOWDEN HILL ROAD NEW HARTFORD NY 13413	06/19/2013	06/19/2018
DOL	NYC		MICHAEL HIRSCH		C/O MZM CORP 163 S MAIN STREET NEW CITY NY 10956	01/28/2016	01/28/2021
DOL	DOL		MICHAEL KTISTAKIS		363 88TH STREET BROOKLYN NY 11209	11/18/2013	11/18/2018
DOL	DOL	*****6033	MICHAEL KUSNIR	KUSNIR CONSTRUCTI ON	2677 ANAWALK ROAD KATONAH NY 10536	08/03/2012	08/03/2017
DOL	DOL		MICHAEL MARGOLIN		4 LEGHORN COURT NEW YORK NY 11746	11/28/2012	11/28/2017

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DOL	DOL		MICHAEL WILSON	WILSON BROTHER DRYWALL CONTRACTORS	36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL		MICHELLE L BARBER		635 LUZERNE ROAD QUEENSBURY NY 12804	09/16/2013	09/16/2018
DOL	DOL	*****2635	MIDLAND CONSTRUCTION OF CEDAR LAKE INC		13216 CALUMET AVENUE CEDAR LAKE IL 46303	11/10/2011	11/10/2016
DOL	NYC		MIGUEL ACOSTA		25-18 100TH STREET EAST ELMHURST NY 11369	08/21/2013	08/21/2018
DOL	NYC		MILANCE HADZIC		22 CALIFORNIA AVE - STE 1 PATERSON NJ 07503	03/11/2015	03/11/2020
DOL	AG		MOHAMMAD RIAZ		46 RUGBY ROAD WESTBURY NY 11590	11/20/2013	11/20/2018
DOL	AG		MOHAMMED N CHATHA		8831 20TH AVENUE/SUITE 6E BROOKLYN NY 11214	11/17/2015	11/17/2020
DOL	NYC	*****2690	MONDOL CONSTRUCTION INC		11-27 30TH DRIVE LONG ISLAND CITY NY 11102	05/25/2011	05/25/2016
DOL	DOL		MORTON LEVITIN		3506 BAYFIELD BOULEVARD OCEANSIDE NY 11572	08/30/2011	08/30/2016
DOL	DOL	*****2737	MOUNTAIN'S AIR INC		2471 OCEAN AVENUE- STE 7A BROOKLYN NY 11229	09/24/2012	09/18/2020
DOL	DOL		MUHAMMAD PERVAIZ		C/O CHAMPION CONSTRUCTION 2131 SCHENECTADY AVENUE BROOKLYN NY 11234	11/18/2015	11/18/2020
DOL	NYC		MUHAMMAD ZULFIQAR		129-06 18TH AVENUE COLLEGE POINT NY 11356	02/09/2012	02/09/2017
DOL	DOL		MURRAY FORTH		P O BOX 74 EAST GREENBUSH NY 12061	02/28/2012	10/01/2017
DOL	DOL		MUZAFFAR HUSSAIN		C/O ABSOLUTE GENERAL CONT 1129 AVENUE UBROOKLYN NY 11229	01/28/2013	01/28/2018
DOL	NYC	*****3613	MZM CORP		163 S MAIN STREET NEW CITY NY 10956	01/28/2016	01/28/2021
DOL	NYC	*****1284	NEW AMERICAN RESTORATION INC		22 CALIFORNIA AVE - STE 1 PATERSON NJ 07503	03/11/2015	03/11/2020
DOL	DA	*****6988	NEW YORK INSULATION INC		58-48 59TH STREET MASPETH NY 11378	05/16/2012	05/08/2020
DOL	NYC	*****4839	NEW YORK RIGGING CORP		58-83 54TH STREET MASPETH NY 11378	02/26/2016	02/26/2021
DOL	DOL		NICHOLAS DEGREGORY JR	NJ DEGREGORY & COMPANY	1698 ROUTE 9 GLENS FALLS NY 12801	05/23/2013	05/23/2018
DOL	NYC		NICHOLAS PROVENZANO		147 BROOME AVENUE ATLANTIC BEACH NY 11509	03/03/2014	03/03/2019
DOL	NYC		NICHOLAS PROVENZANO		147 BROOME AVENUE ATLANTIC BEACH NY 11509	03/03/2014	03/03/2019
DOL	DOL		NIKOLAS PSAREAS		656 N WELLWOOD AVE/STE C LINDENHURST NY 11757	09/01/2011	09/01/2016
DOL	DOL	*****5279	NJ DEGREGORY & COMPANY		1698 ROUTE 9 GLENS FALLS NY 12801	05/23/2013	05/23/2018
DOL	DOL		NJ DEGREGORY & SONS CONSTRUCTION		1698 ROUTE 9 GLENS FALLS NY 12801	05/23/2013	05/23/2018
DOL	NYC	*****1968	NORTH AMERICAN IRON WORKS INC		1560 DECATUR STREET RIDGEWOOD NY 11385	05/15/2015	05/15/2020
DOL	DOL	*****9198	OCTAGON CO		37-11 35TH AVENUE-2ND FL LONG ISLAND CITY NY 11101	01/08/2013	01/08/2018
DOL	DOL		OKBY ELSAYED		1541 EAST 56TH STREET BROOKLYN NY 11234	05/04/2012	05/04/2017
DOL	NYC		OLIVER HOLGUIN		95-26 76TH STREET OZONE PARK NY 11416	10/12/2011	10/12/2016
DOL	NYC	*****8337	OPTIMUM CONSTRUCTION INC		23-73 48TH STREET LONG ISLAND CITY NY 11103	04/24/2014	04/24/2019
DOL	NYC		ORSON ARROYO		C/O METRO DUCT SYSTEMS 12-19 ASTORIA BOULEVARD LONG ISLAND CITY NY 11102	04/16/2014	11/19/2020
DOL	DOL	*****4546	PAF PAINTING CORP		161 TIBBETTS ROAD YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL	*****5242	PAF PAINTING SERVICES INC	GARDEN STATE PAINTING	157 TIBBETTS ROAD YONKERS NY 10103	03/12/2014	03/12/2019
DOL	DOL		PAF PAINTING SERVICES OF WESTCHESTER INC		C/O SPIEGEL & UTRERA 1 MAIDEN LANE - 5TH FL NEW YORK NY 10038	03/12/2014	03/12/2019

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DOL	DOL	*****8802	PAT'S HEATING AND AIR CONDITIONING LTD		P O BOX 371 ROUND LAKE NY 12151	05/12/2014	05/12/2019
DOL	DOL		PATRICIA M RUGGLES		P O BOX 371 ROUND LAKE NY 12151	05/12/2014	05/12/2019
DOL	DOL		PAUL VERNA		C/O AMERICAN STEEL MECHA 693 PAINTER STREETMEDIA PA 19063	02/20/2013	02/20/2018
DOL	DOL	*****9569	PERFORM CONCRETE INC		31 DURANT AVENUE BETHEL CT 06801	07/02/2012	07/02/2017
DOL	NYC		PETER LUSTIG		30 COLUMBUS CIRCLE EASTCHESTER NY 10709	08/21/2012	08/21/2017
DOL	NYC		PETER TRITARIS		5990 58TH AVENUE MASPETH NY 11378	11/18/2013	11/18/2018
DOL	DOL	*****7914	PRECISION SITE DEVELOPMENT INC		89 EDISON AVENUE MOUNT VERNON NY 10550	10/28/2011	10/28/2016
DOL	DOL	*****2989	PROFESSIONAL ESTIMATING & BUSINESS CORP		157 TIBBETS ROAD YONKERS NY 10705	03/12/2014	03/12/2019
DOL	DOL	*****6895	PROLINE CONCRETE OF WNY INC		3090 SHIRLEY ROAD NORTH COLLINS NY 14111	04/19/2011	07/08/2020
DOL	DOL	*****0015	RAMADA CONSTRUCTION CORP		80 SAVO LOOP STATEN ISLAND NY 10309	01/07/2014	01/07/2019
DOL	NYC		RAMESHWAR ASU		137 LIBERTY AVENUE BROOKLYN NY 11212	12/21/2015	12/21/2020
DOL	DOL		RANA A KAHN		1973 81ST ST - SUITE A-5 BROOKLYN NY 11214	01/08/2015	01/08/2020
DOL	NYC		RANTIK PARIKH		13 LORIANN ROAD WARREN NJ 07059	07/15/2015	07/15/2020
DOL	DOL	*****2633	RAW POWER ELECTRIC CORP		3 PARK PLACE MIDDLETOWN NY 10940	09/16/2013	09/15/2019
DOL	NYC		RAYMOND PEARSON		P O BOX 957 PORT JEFFERSON STA NY 11776	03/12/2014	03/12/2019
DOL	DOL		REBECCA THORNE		113 N MAPLE AVENUE GREENSBURG PA 15601	02/21/2013	02/21/2018
DOL	DOL		REGINALD WARREN		C/O RAW POWER ELECTRIC 3 PARK CIRCLEMIDDLETOWN NY 10940	09/15/2014	09/15/2019
DOL	NYC	*****3461	RELIANCE GENERAL CONSTRUCTION INC		644 OCEAN PARKWAY BROOKLYN NY 11230	09/02/2015	09/02/2020
DOL	DOL		REVOLUTIONARY FLOORS LLC		P O BOX 268 STILLWATER NY 12170	09/16/2013	03/21/2019
DOL	DOL		RHINO CONCRETE LLC		101 SULLYS TRAIL/SUITE 20 PITTSFORD NY 14534	11/18/2013	01/07/2019
DOL	DOL		RICHARD WILSON		C/O DUFOUR GROUP INC 353 WEST 56TH STREET #7MNEW YORK NY 10019	06/10/2014	06/10/2019
DOL	DOL	*****8618	RIEKS CONTRACTING LLC		4804 GAHWILER ROAD AUBURN NY 13021	05/01/2015	05/01/2020
DOL	DOL		ROBBYE BISSE SAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003
DOL	DOL	*****1855	ROBERT D BISHOP JR	ROBERT D BISHOP JR	P O BOX 112 MORRISONVILLE NY 12962	07/15/2014	07/15/2019
DOL	DOL		ROBERT D BISHOP JR		P O BOX 112 MORRISONVILLE NY 12962	07/15/2014	07/15/2019
DOL	NYC		ROBERT GUIDO		3256 BRUNER AVENUE BRONX NY 10469	07/29/2014	07/29/2019
DOL	DOL		ROBERT L EVANS		128A NORTH STAMFORD ROAD STAMFORD CT 06903	05/23/2013	05/23/2018
DOL	DOL		ROBERT TORDELLA		125 CHAUTAUQUA AVENUE LAKEWOOD NY 14750	06/24/2015	06/24/2020
DOL	DOL		ROCCO ESPOSITO		C/O ROCMAR CONTRACTING CO 620 COMMERCE STREETTHORNWOOD NY 10594	09/24/2012	09/24/2017
DOL	DOL	*****3859	ROCHESTER ACOUSTICAL CORP		P O BOX 799 HILTON NY 14468	02/19/2016	02/19/2021
DOL	DOL		ROCMAR CONSTRUCTION CORP		620 COMMERCE STREET THORNWOOD NY 10594	09/24/2012	09/24/2017
DOL	DOL	*****7083	ROCMAR CONTRACTING CORP		620 COMMERCE STREET THORNWOOD NY 10594	09/24/2012	09/24/2017
DOL	NYC		RODNEY SCOTT		201 HEMPSTEAD AVENUE WEST HEMPSTEAD NY 11552	10/30/2015	10/30/2020

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DOL	DOL		ROMEO WARREN		C/O RAW POWER ELECTR CORP 3 PARK PLACEMIDDLETOWN NY 10940	09/16/2013	09/15/2019
DOL	DOL		ROSEANNE CANTISANI		11 TATAMUCK ROAD POUND RIDGE NY 10576	05/04/2012	05/04/2017
DOL	DOL		ROSS J MUSCOLINO		10 ST CHARLES STREET THORNWOOD NY 10594	09/03/2013	09/03/2018
DOL	DOL		S & S ELECTRIC		235 BROADWAY SCHENECTADY NY 12306	06/19/2013	06/19/2018
DOL	NYC		SAEED HASAN		4558 BROADWAY #6 NEW YORK NY 10040	08/04/2014	08/04/2019
DOL	DOL	*****4923	SCHENLEY CONSTRUCTION INC		731 WARWICK TURNPIKE HEWITT NJ 07421	06/25/2012	12/11/2017
DOL	NYC	*****2117	SCOTT ELECTRICAL LLC		201 HEMPSTEAD AVENUE WEST HEMPSTEAD NY 11552	10/30/2015	10/30/2020
DOL	DOL		SCOTT LEONARD	GLOBAL TANK CONSTRUCTI ON LLC	P O BOX 1238 SALINA OK 74365	11/28/2012	11/28/2017
DOL	DOL		SEAKCO CONSTRUCTION COMPANY LLC		128A NORTH STAMFORD ROAD STAMFORD CT 06903	05/23/2013	05/23/2018
DOL	DOL	*****9030	SEAKCO NEW YORK LLC	SEAKCO CONSTRUCTI ON COMPANY	128A NORTH STAMFORD ROAD STAMFORD CT 06903	05/23/2013	05/23/2018
DOL	DOL		SEAN BURBAGE	C/O SEAN BURBAGE CORP	445 ROOSA GAP ROAD BLOOMINGBURG NY 12721	04/14/2014	04/14/2019
DOL	DOL	*****6586	SEAN BURBAGE CORP		445 ROOSA GAP ROAD BLOOMINGBURG NY 12721	04/14/2014	04/14/2019
DOL	DOL	*****3540	SEVEN STAR ELECTRICAL CONTRACTING CORP		23-24 STEINWAY STREET ASTORIA NY 11105	06/27/2011	06/27/2016
DOL	DOL		SEVEN STAR ELECTRICAL INC		C/O THEONI ATHANASIADIS 1023 COMMACK ROAD DIX HILLS NY 11746	06/27/2011	06/27/2016
DOL	NYC		SHAFIQUIL ISLAM		11-27 30TH DRIVE LONG ISLAND CITY NY 11102	05/25/2011	05/25/2016
DOL	NYC		SHAHZAD ALAM		21107 28TH AVE BAYSIDE NY 11360	07/02/2012	07/02/2017
DOL	DOL	*****6904	SIGNING STAR LIMITED LIABILITY COMPANY		5 HANSEN PLACE WAYNE NJ 07470	09/18/2013	09/18/2018
DOL	DOL	*****0667	SNEEM CONSTRUCTION INC		43-22 42ND STREET SUNNYSIDE NY 11104	07/01/2011	07/01/2016
DOL	DOL	*****4025	SOLUTION MATTERS INC		198 NORWOOD ROAD PORT JEFFERSON NY 11776	11/19/2015	11/19/2020
DOL	DOL		SPASOJE DOBRIC		61 WILLET STREET - SUITE PASSAIC NJ 07055	07/09/2010	02/23/2017
DOL	NYC	*****4934	SPHINX CONTRACTING CORP		240 HOME STREET TEANECK NJ 07666	08/04/2014	08/04/2019
DOL	DOL		SPORTSCRAFTERS INC		113 N MAPLE AVENUE GREENSBURG PA 15601	02/21/2013	02/21/2018
DOL	DOL	*****3539	SPOTLESS CONTRACTING	IMPACT INDUSTRIAL SERVICES INC	44 THIELLS-MT IVY ROAD POMONA NY 10970	10/14/2011	10/14/2016
DOL	DOL	*****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL		STEPHEN BIANCHI		462 LAKEVIEW AVENUE VALHALLA NY 10595	12/16/2013	12/16/2018
DOL	DOL		STEPHEON SHELDON	FANTASTIC PAINTING	493 LANSING ROAD FULTONVILLE NY 12072	11/18/2013	11/18/2018
DOL	DOL		STEVEN SAGGESE		3005 WYNSUM AVENUE MERRICK NY 11566	08/18/2014	08/18/2019
DOL	DOL		STUART CHAITIN		634 ROUTE 303 BLAUVET NY 10913	07/26/2012	11/19/2018
DOL	NYC	*****9432	SUBLINK LTD		346 THIRD AVENUE PELHAM NY 10803	11/19/2015	11/19/2020
DOL	DOL	*****3210	SUPER SWEEP	FMS	4 LEGHORN COURT NEW YORK NY 11746	11/28/2012	11/28/2017
DOL	DOL		SUZANNE G GOLD	C/O GOLDS FLOORING INSTALLATION S INC	25 HAMILTON ROAD MONTICELLO NY 12701	10/16/2013	10/16/2018
DOL	DOL	*****7441	T & T CONCRETE INC		2560 HAMBURG TURNPIKE P O BOX 367 LACKAWANNA NY 14218	07/08/2015	07/08/2020
DOL	DOL	*****9676	T D CONTRACTORS CORP	T D CONTRACTOR S INC	113 N MAPLE AVENUE GREENSBURG PA 15601	02/21/2013	02/21/2018

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DOL	DOL		T D CONTRACTORS INC		113 N MAPLE AVENUE GREENSBURG PA 15601	02/21/2013	02/21/2018
DOL	DOL		TAMMY LACITIGNOLA		C/O CATSKILL FENCE INSTAL 5445 ROUTE 32CATSKILL NY 12414	08/22/2014	08/22/2019
DOL	DOL	*****9852	TAP STEEL INC		ROUTE 26 3101 P O BOX 457CONSTABLEVILLE NY 13325	01/28/2016	01/28/2021
DOL	DOL		TECH-MECHANICAL FAB DC INC		5 PARKER AVENUE POUGHKEEPSIE NY 12601	03/25/2014	03/25/2019
DOL	DOL	*****0887	THE BRINSON PAINTING CORPORATION		72 TAUNTON PLACE BUFFALO NY 14216	04/14/2015	04/14/2020
DOL	DOL	*****8174	THE DALRYMPLE CORPORATION		UNIT 278 541 10TH STREET NWTALANTA GA 30318	12/01/2015	12/01/2020
DOL	DOL	*****8174	THE DALRYMPLE GROUP LLC		289 JONESBORO RD/ STE 216 MCDONOUGH GA 30253	12/01/2015	12/01/2020
DOL	DOL	*****4293	THE J OUVINA GROUP LLC		344 SOUNDVIEW LANE COLLEGE POINT NY 11356	11/22/2011	11/22/2016
DOL	DOL		THE THORNE GROUP INC		113 N MAPLE AVENUE GREENSBURG PA 15601	02/21/2013	02/21/2018
DOL	DOL	*****2070	THE UNIVERSAL GROUP OF NEW YORK INC		212 OXFORD WAY SCHENECTADY NY 12309	12/11/2012	09/16/2018
DOL	DOL	*****9243	THE WELCOME MAT PROPERTY MANAGEMENT LLC		P O BOX 268 STILLWATER NY 12170	09/16/2013	03/21/2019
DOL	DOL		THEONI ATHANASIADIS		C/O SEVEN STAR ELECTRICAL 23-24 STEINWAY STREETASTORIA NY 11105	06/27/2011	06/27/2016
DOL	DOL		THOMAS DESANTIS	DESANTIS ENTERPRISES	161 OSWEGO RIVER ROAD PHOENIX NY 13135	09/24/2013	11/18/2018
DOL	NYC		THOMAS SCARINCI		130-43 92ND AVENUE RICHMOND HILLS NY 11418	11/27/2013	11/27/2018
DOL	DOL	*****2734	THREE FRIENDS CONSTRUCTION CORP		986 MADISON AVENUE PATERSON NJ 07501	01/03/2013	01/03/2018
DOL	NYC	*****6253	THUNDER BROTHERS CORP		24 CONGRESS LANE SOUTH RIVER NJ 08882	05/01/2013	05/01/2018
DOL	DOL		TIMOTHY A PALUCK		C/O TAP STEEL INC RTE 26 3101/ P O BOX 457CONSTABLEVILLE NY 13325	01/28/2016	01/28/2021
DOL	DOL		TIMOTHY F BARBER		635 LUZERNE ROAD QUEENSBURY NY 12804	09/16/2013	09/16/2018
DOL	NYC		TIMOTHY O'SULLIVAN		C/O SNEEM CONSTRUCTION 4322 42ND STREET SUNNYSIDE NY 11104	07/01/2011	07/01/2016
DOL	NYC	*****1523	TM MECHANICAL CORP		130-43 92ND AVENUE RICHMOND HILLS NY 11418	11/27/2013	11/27/2018
DOL	DOL	*****0600	TOMSON ALLOYS RECYCLING INC		143 FILLMORE AVENUE BUFFALO NY 14210	01/08/2015	01/08/2020
DOL	DOL	*****8176	TOURO CONTRACTING CORP		1541 EAST 56TH STREET BROOKLYN NY 11234	05/04/2012	05/04/2017
DOL	DOL	*****6914	TRI-COUNTY RESTORATIONS & CONSTRUCTION INC		13 SUMMERSET DRIVE WALKILL NY 12589	08/22/2014	08/22/2019
DOL	DOL		TRI-COUNTY RESTORATIONS INC		392 ROCK CUT ROAD WALDEN NY 12586	08/22/2014	08/22/2019
DOL	DOL	*****5213	TRIAD PAINTING CO INC		656 N WELLWOOD AVE/STE C LINDENHURST NY 11757	09/01/2011	09/01/2016
DOL	DOL		TROY D CLARKE	ADVANCED METALS	387 RIVERSIDE DRIVE JOHNSON CITY NY 13790	10/01/2012	10/01/2017
DOL	AG	*****6490	UNIVERSAL STEEL FABRICATORS INC		90 JUNIUS STREET BROOKLYN NY 11212	01/23/2014	01/23/2019
DOL	NYC	*****7174	V&R CONTRACTING		P O BOX 957 PORT JEFFERSON STA NY 11776	03/12/2014	03/12/2019
DOL	NYC		VALERIE VISCONTI		346 THIRD AVENUE PELHAM NY 10803	11/19/2015	11/19/2020
DOL	NYC		VEAP SELA	C/O COLONIAL ROOFING COMPANY INC	247 48TH STREET BROOKLYN NY 11220	02/05/2014	02/05/2019
DOL	DOL	*****3270	VEZANDIO CONTRACTING CORP		530 BEECH STREET NEW HYDE PARK NY 11040	07/02/2012	07/02/2017
DOL	NYC		VICK CONSTRUCTION		21 DAREWOOD LANE VALLEY STREAM NY 11581	12/31/2013	12/31/2018
DOL	NYC		VICKRAM MANGRU	VICK CONSTRUCTI ON	21 DAREWOOD LANE VALLEY STREAM NY 11581	12/31/2013	12/31/2018

NYS DOL Bureau of Public Work Debarment List 04/18/2016
Article 8

DOL	NYC		VINCENT PIZZITOLA		P O BOX 957 PORT JEFFERSON STA NY 11776	03/12/2014	03/12/2019
DOL	DOL		WESLEY J STAROBA		206 TALLY HO COURT SCHENECTADY NY 12303	06/19/2013	06/19/2018
DOL	DOL	*****0078	WESLEY J STAROBA INC	S & S ELECTRIC	235 BROADWAY SCHENECTADY NY 12306	06/19/2013	06/19/2018
DOL	DOL	*****7617	WHITE PLAINS CARPENTRY CORP		P O BOX 309 WHITE PLAINS NY 10603	12/04/2009	05/04/2017
DOL	DOL		WILLIAM CONKLIN		5 PARKER AVENUE POUGHKEEPSIE NY 12601	03/25/2014	03/25/2019
DOL	DOL		WILLIAM MAZZELLA		134 MURRAY AVENUE YONKERS NY 10704	02/03/2014	02/03/2019
DOL	DOL		WILLIAM THORNE		113 N MAPLE AVENUE GREENSBURG PA 15601	02/21/2013	02/21/2018
DOL	DOL		WILLIE BRINSON		72 TAUNTON PLACE BUFFALO NY 14216	04/14/2015	04/14/2020
DOL	DOL	*****6195	WILSON BROTHER DRYWALL CONTRACTORS		36 ABERSOLD STREET ROCHESTER NY 14621	08/31/2015	08/31/2020
DOL	DOL		YURIY IVANIN		C/O MOUNTAIN'S AIR INC 2471 OCEAN AVENUE-STE 7ABROOKLYN NY 11229	09/24/2012	09/18/2020

APPENDIX D

CRANE INSPECTION REPORTS

SIMMERS

CRANE DESIGN &
SERVICES COMPANY

ENGINEERING

HOISTS
CRANES

255 FIRE TOWER DRIVE
Tonawanda, N.Y. 14150

24 HR. REPAIRS

PH. 716-332-0760 FAX: 716-332-0759

CUSTOMER	ERIE COUNTY WATER	CAPACITY	15 TON	BRIDGE MFR	CONCO
DATE	SEPT., 2014	HOIST MFR	CONCO	MODEL NUMBER	6384
JOB NO.	BI 70906	MODEL #	6384	SERIAL NUMBER	6384
TECHNICIAN	DD	SERIAL #	6384	PENDANT	EUCLID
TYPE OF SYS.	BRIDGE TR TR DG	TROLLEY MFR	CONCO	VFD	0
BUILDING NO.	RAW WATER PUMP RM	MODEL #	6384		0
MACHINE NO.	#11	SERIAL #	6384	POWER	460

0	N/A
1	SATISFACTORY
2	MONITOR
3	UNSATISFACTORY

CRANE INSPECTION REPORT

ITEM NO.	DEF.	CODE	ITEM NO.	DEF.	CODE
1.	MONORAIL	0	10.	FESTOON TROLLEY / PENDANT	
	1A. CONNECTION, BOLTS, WELDS	0	11.	HOIST CHAIN	0
	1B. BEAMS / TRACK	0		11A. CHAIN DIAMETER	0
	1C. HANGERS	0		11B. TWISTED / STRETCHED	0
2.	JIB	0		11C. LUBRICATION / RUSTED	0
	2A. CONNECTION, BOLTS, WELDS	0		11D. ROLLER CHAIN	0
	2B. BEAMS	0		11E. CHAIN BUCKET	0
3.	BRIDGE AND GANTRY		12.	HOIST WIRE ROPE	
	3A. CONNECTION, BOLTS, WELDS	1		12A. SIZE DIAMETER 5/5	1
	3B. WHEELS AND BEARINGS	1		12B. BROKEN WIRES	1
	3C. BRIDGE DRIVE / GEARING	1		12C. KINKS	1
	3D. OIL LEVEL / SEALS	0		12D. 2 WRAPS LEFT ON DRUM IN LOW POSITION	1
	3E. BRIDGE BRAKE	0		12E. LUBRICATION / RUSTED	1
	3F. HAND CHAIN AND SPIDER	1	13.	HOIST DRUM	1
	3G. BRIDGE STOPS	1	14.	UPPER SHEAVES	
	3H. RUNWAY CONDUCTOR / COLLECTOR SHOES	0		14A. UPPER SHEAVE SUPPORT	1
4.	TROLLEY			14B. UPPER SHEAVE BEARINGS	1
	4A. FRAME AND HANGERS	1	15.	PENDANT	
	4B. WHEELS AND BEARINGS	1		ON / OFF MOMENTARY MAINTAIN	0
	4C. TROLLEY DRIVE / GEARING	1		HOIST	1
	4D. OIL LEVEL / SEALS	0		TROLLEY	0
	4E. TROLLEY BRAKE	0		BRIDGE	0
	4F. HAND CHAIN AND SPIDER	1		15A. BOX CONDITION	1
	4G. TROLLEY STOPS	1		15B. FUNCTIONS IDENTIFIED	1
5.	CLEARANCE FROM OBSTRUCTIONS	1		15C. PUSHBUTTONS RETURN TO OFF POSITION	1
6.	HOIST			15D. CABLE CONDITION	1
	6A. CHAIN FALL	0		15E. PENDANT SUPPORT	1
	6B. PNEUMATIC	0	16.	CONTROL PANELS	
	6C. ELECTRIC	1		16A. CONTACTORS / RELAYS	1
	6D. OIL LEVEL / SEALS	1		16B. TRANSFORMER	1
	6E. BRAKE	1		16C. WIRING	1
	6F. GEAR BOX	1	17.	MAIN ELECTRICAL DISCONNECT	1
7.	LIMIT SWITCH, GEARED	1		17A. PROVISION TO LOCK OUT	1
8.	LIMIT SWITCH, WEIGHTED / PADDLE	0		17B. IDENTIFIED	1
9.	HOOK BLOCK			17C. ACCESSIBLE FROM GROUND	1
	9A. HOOK THROAT 4 1/2	1	18.	CAPACITY LOAD RATINGS	
	9B. SAFETY LATCH	NONE		18A. LOAD BEAM	1
	9C. CHAIN SPROCKET	0		18B. TROLLEY	1
	9D. SHEAVES / SHEAVE BEARINGS	1		18C. HOIST	1
	9E. GUARDS	1	19.	CONDUIT & SEALTITE	1

SIMMERS

CRANE DESIGN &
SERVICES COMPANY

HOISTS
CRANES

255 FIRE TOWER DRIVE
Tonawanda, N.Y. 14150
PH. 716-332-0760 FAX: 716-332-0759

ENGINEERING
24 HR. REPAIRS

CUSTOMER	ERIE COUNTY WATER	CAPACITY	1 TON	BRIDGE MFR	0
DATE	06-Sep-14	HOIST MFR	CM	MODEL #	
JOB NO.	BI 70906	MODEL #	WL	SERIAL #	
TECHNICIAN	GS	SERIAL #	LW6068UF	PENDANT	CM
TYPE OF SYS.	MONORAIL	TROLLEY MFR	CM	VFD	
BUILDING NO.	RAW WATER SCREEN RM	MODEL #	VALUSTAR		
MACHINE NO.	12	SERIAL #	CM 1 TON	POWER	120V

0	N/A
1	SATISFACTORY
2	MONITOR
3	UNSATISFACTORY

HOIST INSPECTION REPORT

ITEM NO.	ITEM	CODE	ITEM NO.	ITEM	CODE
1.	MONORAIL		12.	HOIST WIRE ROPE	0
	1A. CONNECTION, BOLTS, WELDS	1		12A. SIZE DIAMETER	0
	1B. BEAMS / TRACK	1		12B. BROKEN WIRES	0
	1C. HANGERS	1		12C. KINKS	0
2.	JIB	0		12D. 2 WRAPS LEFT ON DRUM IN LOWER POSITION	0
	2A. CONNECTION, BOLTS, WELDS	0		12E. LUBRICATION / RUSTED	0
	2B. BEAMS	0	13.	HOIST DRUM	0
4.	TROLLEY		14.	UPPER SHEAVES	0
	4A. FRAME AND HANGERS	1		14A. UPPER SHEAVE SUPPORT	0
	4B. WHEELS AND BEARINGS	1		14B. UPPER SHEAVE BEARINGS	0
	4C. TROLLEY DRIVE / GEARING	1	15.	PENDANT	0
	4D. OIL LEVEL / SEALS	0		ON / OFF	0
	4E. TROLLEY BRAKE	0		HOIST	1
	4F. HAND CHAIN AND SPIDER	1		TROLLEY	0
	4G. TROLLEY STOPS	1		BRIDGE	0
5.	CLEARANCE FROM OBSTRUCTIONS	1		15A. BOX CONDITION	1
6.	HOIST			15B. FUNCTIONS IDENTIFIED	1
	6A. CHAIN FALL	0		15C. PUSHBUTTONS RETURN TO OFF POSITION	1
	6B. PNEUMATIC	0		15D. CABLE CONDITION	1
	6C. ELECTRIC	1		15E. PENDANT SUPPORT	1
	6D. OIL LEVEL / SEALS	0	16.	CONTROL PANELS	
	6E. BRAKE	1		16A. CONTACTORS / RELAYS	1
	6F. GEAR BOX	0		16B. TRANSFORMER	1
7.	LIMIT SWITCH, GEARED	0		16C. WIRING	1
8.	LIMIT SWITCH, WEIGHTED / PADDLE	0	17.	MAIN ELECTRICAL DISCONNECT	
9.	HOOK BLOCK			17A. PROVISION TO LOCK OUT	1
	9A. HOOK 4 THROAT 1 1/4	1		17B. IDENTIFIED	1
	9B. SAFETY LATCH	1		17C. ACCESSIBLE FROM GROUND	1
	9C. CHAIN SPROCKET	0	18.	CAPACITY LOAD RATINGS	
	9D. SHEAVES / SHEAVE BEARINGS	0		18A. LOAD BEAM	1
	9E. GUARDS	0		18B. TROLLEY	1
10	FESTOON TROLLEY, PENDANT	1		18C. HOIST	1
11.	HOIST CHAIN		19.	CONDUIT & SEALTITE	1
	11A. CHAIN DIAMETER 1/4	1			
	11B. TWISTED / STRETCHED	1		*****NOTES*****	
	11C. LUBRICATION / RUSTED	2	11C	CHAIN VERY RUSTY (LUBED DURING INSPECTION)	
	11D. ROLLER CHAIN	0		RECOMMEND TO CUSTOMER TO LUBE MORE OFTEN	
	11E. CHAIN BUCKET	0			

APPENDIX E

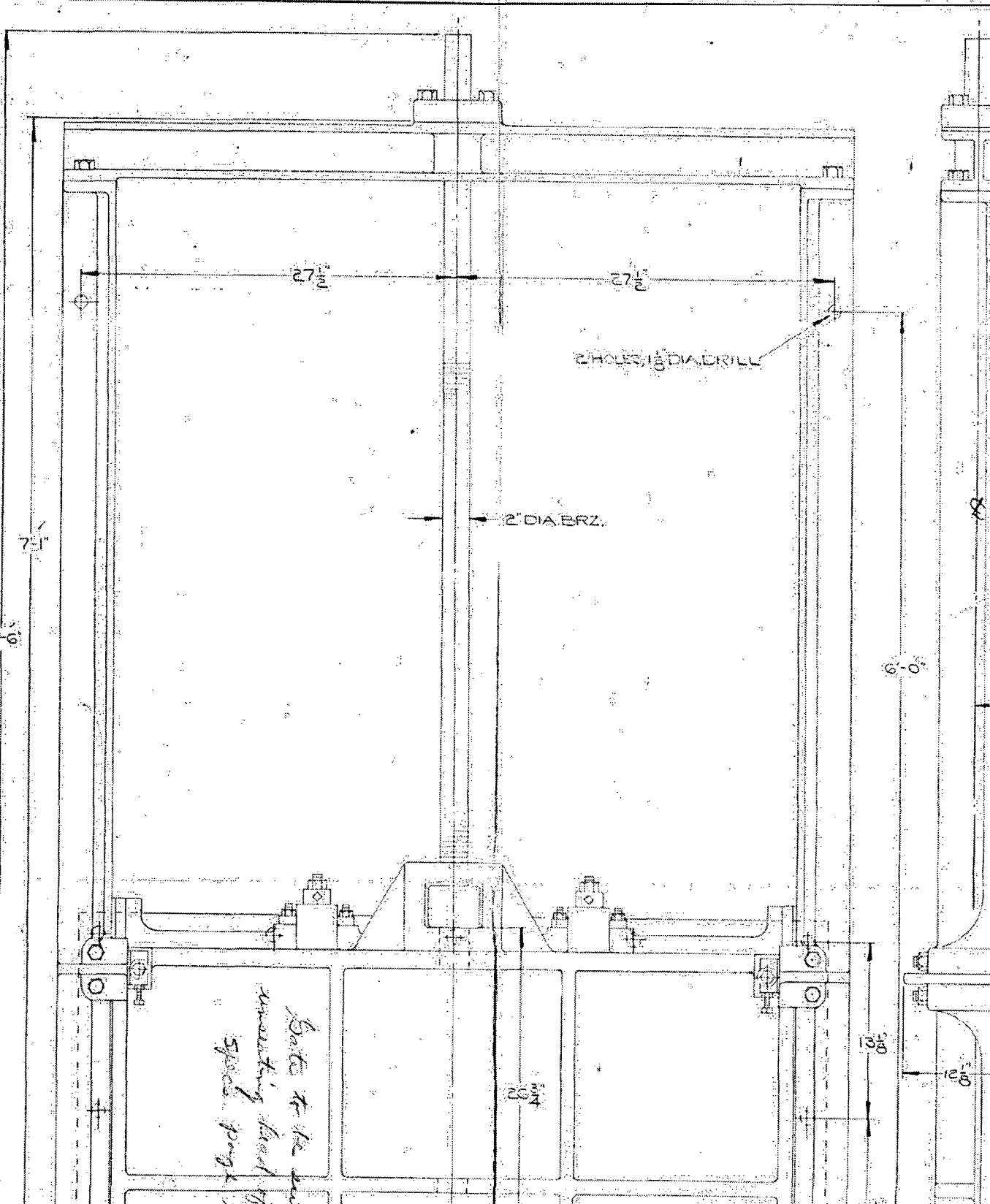
EXISTING SLUICE GATES SHOP DRAWINGS

ALT.	CHANGE	BY	CHKD.	DATE	ALT.	CHANGE	BY	CHKD.	DATE	ALT.	CHANGE	BY	CHKD.	DATE

TEMPLATE NO. B-048004

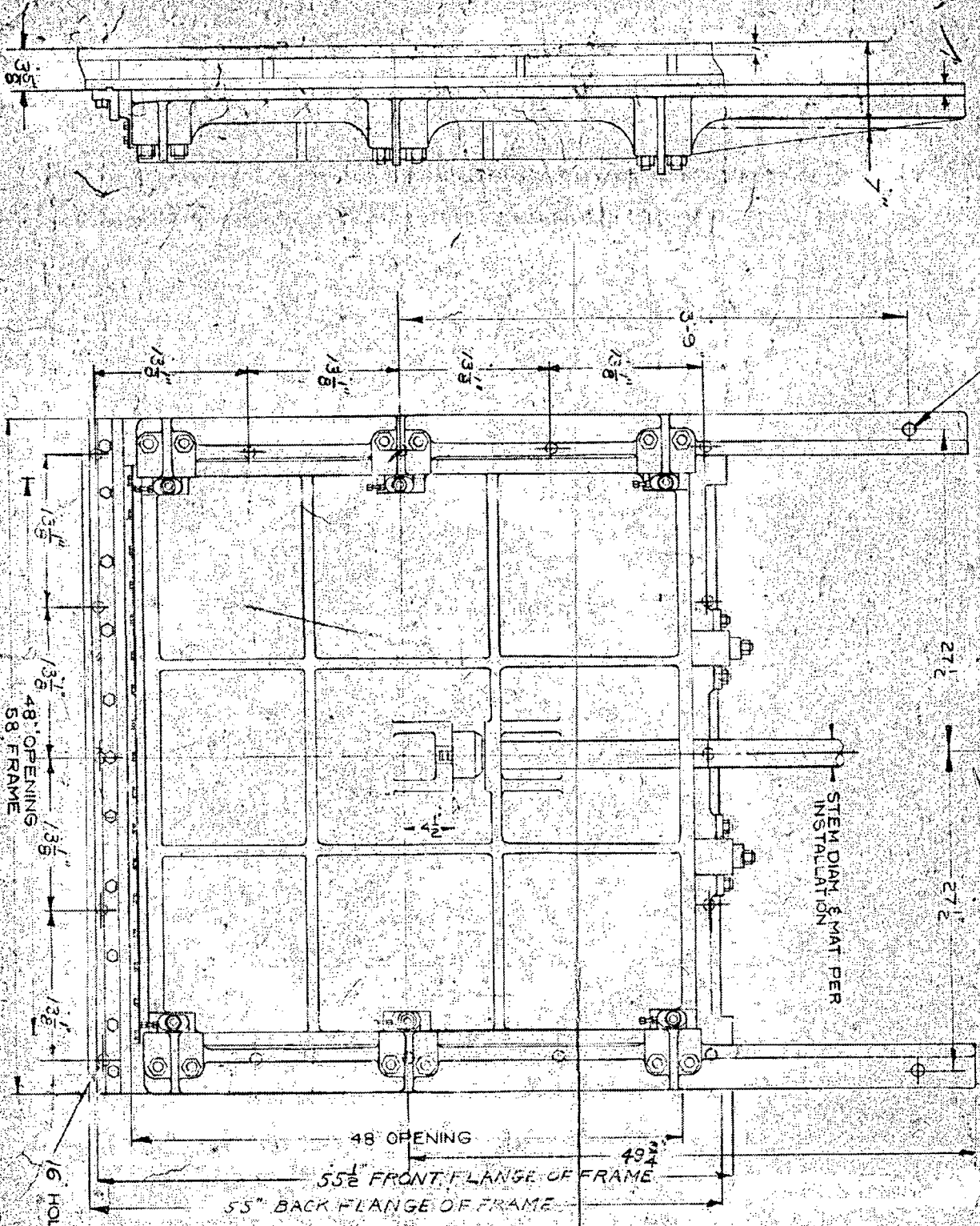
See Notes to Assembly Drawing of Section 1 base

*See F-185 & 243
F-199*



INDEX SYMBOL
RODNEY
 THIS PRINT IS
 RODNEY HUNT M
 ACCEPT THIS
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 LIT OR COPIED
 RETURNED UPON
 HUNT MACHINE C
 ABLE FEATURES
 ED BY U.S. AND
 PAT. PEND.

*Pair Water Pump the
from Chambers & Jackson well
see F-186 & 199*



TEMPLATE NO. B-046004
 BY CND. DATE ALT.
 CHANGE
 BY CND. DATE ALT.
 CHANGE
 BY CND. DATE
 48" OPENING
 58" FRAME
 16 HOLES

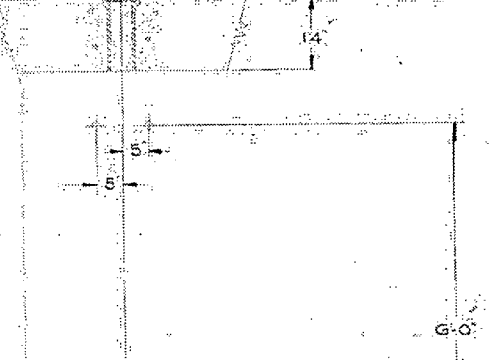
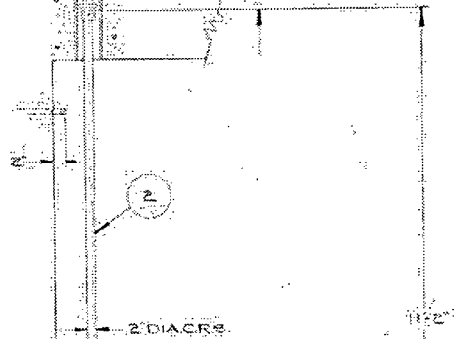
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BRANCH OF THE STEEL WORKERS' UNION LOCAL 1000 AT FINISHED BY R.H.M.S.
LOCATION IN RAW WATER PUMPING STATION WELL.
BACK SELF REPORT CONSULTING ENGINEERS

FIN FLOOR E.L. 558.00

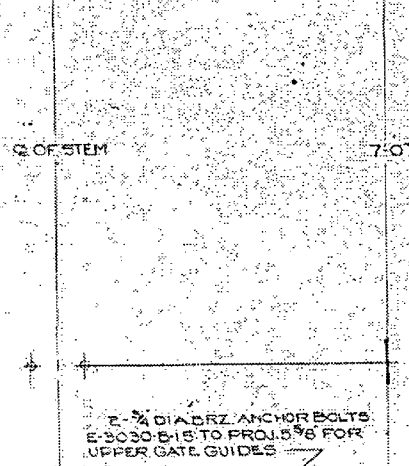
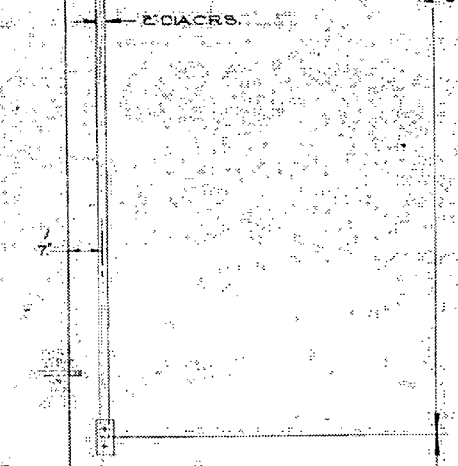
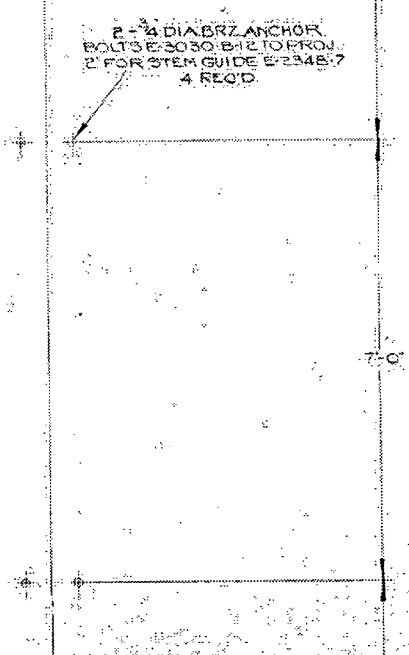
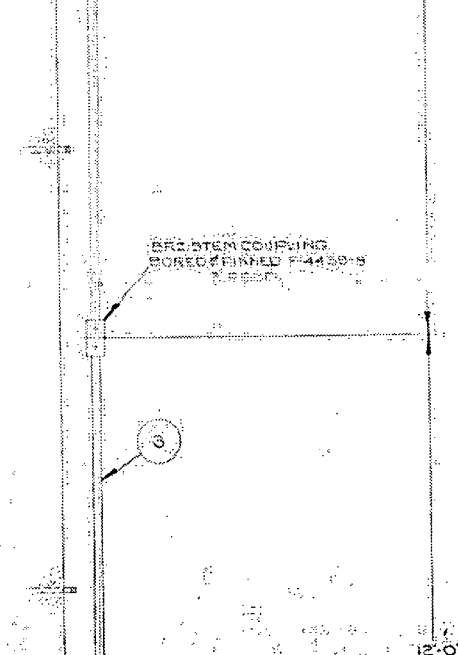
2 CO OPERATING NUT
E-3223-3

C.I. FLOOR BOX
E-5320-11
KATCHET
62 HANDLE WRENCH
IS INCLUDED FROM
Spec page 156



B.R. STEM COUPLING
BORED FINNED E-4459-5
E-3223-3

2 - 3/4 DIA BRZ ANCHOR
BOLTS E-3030-B12 TO PROJ.
2" FOR STEM GUIDE E-2345-7
4 REQ'D



2 - 3/4 DIA BRZ ANCHOR BOLTS
E-3030-B12 TO PROJ. 5/8" FOR
UPPER GATE GUIDES

APPENDIX F

AURORA ENVIRONMENTAL REPORT



Aurora Environmental LLC

1850 Davis Road
West Falls NY 14170

October 7, 2015

Iain Ramage, R.A., LEED A.P.
Nussbaumer & Clarke, Inc.
3556 Lake Shore Road, Suite 500
Buffalo, NY 14219-1494

**Re: Pre-renovation Asbestos Inspection
Erie County Water Authority
Sturgeon Point Raw Water Pump Station
722 Sturgeon Point Rd
Derby, NY 14047**

Dear Mr. Ramage:

Enclosed please find the pre-renovation asbestos inspection report for the above referenced property. The inspection was conducted on September 29, 2015.

If after reviewing this report you have any questions, or if we can be of assistance in any other way, please do not hesitate to call.

Sincerely,

John Pusztay

Summary Tabulation

1. Introduction
2. Methodology
3. Executive summary
- 3A. Suspect asbestos-containing materials
- 3B. Asbestos-containing materials
4. Lead in paint

Appendices

- A General conditions of inspection
- B Certifications and licenses
- C Laboratory reports and chains of custody
- D Sample location maps

1 Introduction

Aurora Environmental LLC (Aurora) was retained by Nussbaumer & Clarke, Inc. to perform a Pre-renovation Asbestos Inspection of The Erie County Water Authority's Sturgeon Point Raw Water Pump Station located at 722 Sturgeon Point Road, Derby, NY. The scope of proposed renovation includes demolition of the lower roof portion of the building and the replacement of large pipe sections and equipment inside the main building.

Aurora was charged with:

- * Locating suspect asbestos containing materials within client-defined areas
- * Sampling of these materials to ascertain asbestos content
- * Identifying the locations, quantities and conditions of confirmed asbestos containing materials
- * Sampling representative paint films and submit for total lead analysis by AAS

Although the report is a comprehensive analysis of the asbestos inspection work performed, it would be helpful to review all applicable federal, state and local rules, laws and regulations regarding the handling and treatment of asbestos containing building materials (ACBM). The following is a list of suggested reading and information sources relating to asbestos:

- * New York State Department of Labor Industrial Code Rule 56
- * National Emission Standard for Hazardous Air Pollutants (NESHAPS)
- * Occupational Safety and Health Administration
- * Environmental Protection Agency rule CFR 763.46 Asbestos Hazard Emergency Response Act

2 **Methodology**

All work performed by Aurora was conducted in accordance with applicable regulations including New York State Department of Labor standards 12 NYCRR Part 56, National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Occupational Safety and Health Administration regulations. All Aurora personnel assigned to conduct inspections have completed the Environmental Protection Agency (EPA) required training and New York State Department of Labor Division of Safety and Health certification program.

Based on the homogeneous areas, samples of suspect materials were collected and transported to a NYS DOH ELAP accredited laboratory for analysis.

Samples were analyzed using Polarized Light Microscopy (PLM) in accordance with NYS DOH ELAP Item #198.1 or #198.6. For materials classified as non-friable organically bound materials (NOBs) that were analyzed as equal to or less than 1% asbestos by PLM, additional analysis was performed under Transmission Electron Microscopy (TEM) in accordance with NYS DOH ELAP Item #198.4. The results of this analysis confirmed whether or not a suspect material actually contained asbestos. The confirmed materials are listed in **SECTION 3 Executive Summary**.

3. Executive summary

The pre-renovation asbestos inspection included identification, quantification, assessment for condition, sampling and analysis of suspect asbestos containing materials indicated for disturbance by proposed renovations at 722 Sturgeon Point Road, Derby, NY. The summary of all suspect materials are reported in **3A**. Confirmed or assumed asbestos containing materials are reported in **3B**. Copies of all laboratory analysis reports and chains of custody listing locations of sample collection are located in **Appendix C**.

3A. Suspect asbestos-containing materials

The inspection was conducted on September 29, 2015. The following materials were observed and assessed as part of this inspection:

HAN Number	Description
400	Pipe Jacket- tar
401	Pipe Jacket-tar
402	Pipe Jacket-tar
500	Pipe Jacket- paper on fiberglass
600	Caulk- black , Joint of R-1, and R-2
601	Caulk- perimeter, black - covering bolts
602	Gaskets at flanged pipe connections
603	Seam caulk - gray
604	Door caulk - white
605	Compression filler - black
606	Window glazing compound (screen bldg.)
607	Door Caulk (pump house)
700	Roofing- built up (R-1)
701	Flashing (R-1)
702	Silver Seal (R-1)
703	EPDM Roofing system- bottom layer

3B. Asbestos-containing materials

Sampling and analysis of the suspect materials under Polarized Light Microscopy, and where necessary under Transmission Electron Microscopy, confirmed the following materials as asbestos containing building materials (See Appendix C for laboratory reports and chains of custody):

HAN	Description	Location	Quantity	Friability	Condition
400/401/402	Pipe Jacket-tar	Pumps 1,2,3, and 4 and associated large diameter (30" and 48") piping	2000 SF	Non-friable	Damaged
500	Pipe Jacket-paper on fiberglass	Pump 1 (30" diameter)	88 SF	Non-friable	Damaged
600	Caulk- Black	Roof of screen building at Pump House	2 SF	Non-friable	Intact
602*	Gaskets at flanged pipe connections	Main pipe and pump pipes	27 connections (3 SF each)	Unknown	Unknown
606	Window glazing compound	5 Windows, Screen building, east side	5 SF	Non-friable	Intact
701	Roof Flashing	R-1 perimeter	120 SF	Non-friable	Intact
702	Silver Seal	R-1 at connection to Pump house and roof penetrations	25 SF	Non-friable	Intact

*Material was not accessible for sampling and is assumed asbestos containing.

4. Lead in paint

Representative dry paint films were sampled and analyzed for the presence of lead. The following dry paint films were tested:

Sample #	Color	Substrate	Location	Result (%Pb by weight)
1	Blue	metal	Traveling Screen – Screen Building	<level of detection
2	White	metal	Traveling Screen– Screen Building	<level of detection
3	White	metal	Tension spring– Screen Building	<level of detection
4	Gray	concrete	Wall - Screen Building	0.0064
5	Blue	concrete	Wall - Screen Building	0.0048
6	Red	metal	Gas pipe - Screen Building	0.021
7	Gray	metal	Structural steel- Screen Building	0.034
8	Gray	metal	Door frame - Screen Building	0.0062
9	Gray	metal	Door lentil - Screen Building	<level of detection
10	Blue	metal	Water pipe – Pump station basement	0.029
11	Blue	metal	Pump #1 – Pump station basement	0.054
12	Blue	metal	Pump #5 – Pump station basement	0.028
13	Blue	metal	Pump #4 – Pump station basement	3.8
14	Blue	metal	Pump #2 – Pump station basement	0.062

OSHA's Lead Exposure in Construction Rule (29 CFR Part 1926.62) applies to all construction activities involving potential lead exposures. This regulation is applicable if lead is present in any detectable amount.

Copies of all laboratory analysis reports and chains of custody listing locations of sample collection are located in Appendix C. Only representative sampling was conducted at this time. This inspection shall not be construed as a surface by surface inspection in accordance with HUD Guidelines.

Appendix A General conditions of inspection

1. This inspection was limited to those areas presented to Aurora's personnel by client representatives. Aurora Environmental LLC neither accepts nor implies any liability for ACBM that may be present between walls, floors or interstitial areas not readily accessible to our personnel. Should additional suspect materials be discovered during renovation, these materials should immediately be assessed for asbestos content prior to disturbance.
2. The results of the laboratory analytical reports that may be contained herein are the product of the knowledge, experience and expertise of the laboratory retained to perform such services.
3. Aurora Environmental LLC neither accepts nor implies any liability for the implementation of the recommendations found within this report.
4. Aurora Environmental LLC cannot be held responsible or liable for the misrepresentation of fact, misstatements or withholding of relevant information of those parties interviewed during this inspection.
5. This report is based on the condition and contents present at the site on the day of the inspection.
6. If paint samples were collected as part of this inspection, unless otherwise specifically stated, this report shall not be construed as an inspection for lead-based paint in accordance with HUD Guidelines for Evaluation and Control of Lead-based Paint.

Appendix B Certifications and licenses

New York State – Department of Labor

Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

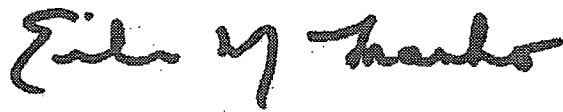
Aurora Environmental LLC
1850 Davis Road
West Falls, NY 14170

FILE NUMBER: 13-70444
LICENSE NUMBER: 70444
LICENSE CLASS: RESTRICTED
DATE OF ISSUE: 02/25/2015
EXPIRATION DATE: 02/28/2016

Duly Authorized Representative – John Pusztay:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.



Eileen M. Franko, Director
For the Commissioner of Labor

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER

Expires 12:01 AM April 01, 2016
Issued April 01, 2015



CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MS. RHONDA R. MCGEE
EMSL ANALYTICAL INC
490 ROWLEY ROAD
DEPEW, NY 14043

NY Lab Id No: 11606

*is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:*

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual

Serial No.: 52441

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the program. Consumers are urged to call (518) 485-8570 to verify the laboratory's accreditation status.

Appendix C Laboratory reports and chains of custody

14150 4239

Aurora Environmental LLC

1850 Davis Road, West Falls, NY 14170
716-655-5800 www.auroraenviro.com

Bulk Sample
Chain of Custody

Client Name/Contact: Mulsbaumer & Clarke, Inc. / Jaina Ramsey

Client Address _____

Site Address ⁷²² \$ Twissan point Rd. Delby NY 14047

9/23/15 AE475 PLM/TEP 30 72 HR
Date Job# Analysis Requested # of Samples TAT Page 1 of 2

Sample ID#			Description	Sample Location	Notes
Date	HAN	#			
9/23/15	400	1	Pipe Jacket - Tar	pump 3	- pump house
	400	2	Pipe Jacket - Tar	main Main Line side	By pump 5 - pump house
	401	1	Pipe Jacket - Tar	pump 4	- pump house
	401	2	Pipe Jacket - Tar	main line	By pump 1 - pump house
	402	1	Pipe Jacket - Tar	pump 2	- pump house
	402	2	Pipe Jacket - Tar	main line	between pump 2 & 3 - pump house
	500	1	pump Pipe Jacket Fiberglass	pump 5	- pump house
	500	2	Pipe Jacket on Fiberglass	pump 5	- pump house
	600	1	Caulk - Black	R-1	where roof of screen bldg. connected to pump house
	600	2	Caulk - Black	R-1	where roof of screen bldg. connected to pump house
	601	1	Caulk - perimeter - covering bolts	R-2	
	601	2	Caulk - perimeter - covering bolts	R-2	
	603	1	Seam caulk	South side	
	603	2	seam caulk	North side	
✓	604	1	Door Caulk	North side	screen bldg.

Notes and special instruction: Positive stop by H.A.C # 12 mail - Craig

Craig Lablil
Sampled by: print

Craig Lablil
Signature

9/23/15
Date

Craig Lablil
RECEIVED
SEP 25 2015
Received by: nrnt

Craig Lablil
Signature

9/24/15
Date

WI
Circulation

9:23 AM
Time

BY: [Signature]

141504239



Aurora Environmental LLC

1850 Davis Road, West Falls, NY 14170
716-655-5800 www.auroraenviro.com

Bulk Sample
Chain of Custody

Client Name/Contact: Alissa Newman + Aurora Env. Inc. / Erin Romano

Client Address _____

Site Address 722 STURGEON POINT RD. DELCO NY 14047

9/23/15 AE428 PLA/TEM 30 92 HR
Date Job# Analysis Requested # of Samples TAT Page 2 of 2

Sample ID#			Description	Sample Location	Notes
Date	HAN	#			
9/23/15	604	2	Door curia	North side - door	Screen Aids.
	605	1	Compression Filler	South side	
	605	2	Compression Filler	North side	
	606	1	window glazing	East side	Screen Aids
	606	2	window glazing	East side	Screen Aids
	607	1	Door curia	West side - Pump House	
	607	2	Door curia	West side - Pump House	
	700	1	Roofing - Built up	R-1	
	700	2	Roofing - Built up	R-1	
	701	1	Flashing	R-1	
	701	2	Flashing	A-1	
	702	1	Silver seal	R-1	
	702	2	Silver seal	R-1	
✓	703	1	Roofing - Bottom Layer	R-2	
✓	703	2	Roofing - Bottom Layer	R-2	

Notes and special instruction:

* See p.1

Craig Libstid
Sampled by: print

Craig Libstid
Signature

9/23/15
Date

Craig Libstid
RECEIVED
SEP 25 2015
Received by: print

Craig Libstid
Signature

9/23/15
Date

WT
Signature

9:23 AM
Time

BY: TWO

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043
 Phone/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com> buffalolab@emsl.com

EMSL Order: 141504239
 CustomerID: AEVT25
 CustomerPO:
 ProjectID:

Attn: **John Pusztay**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
 Fax:
 Received: 09/25/15 9:23 AM
 Analysis Date: 9/28/2015
 Collected: 9/23/2015

Project: AE475 / 722 Sturgeon Point Rd. Derby, NY 14047

**Test Report: Asbestos Analysis of Non-Friable Organically Bound materials by
 Transmission Electron Microscopy via NYS ELAP Method 198.4**

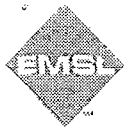
SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES	% TOTAL ASBESTOS
9/23/15 400-1 141504239-0001	pump 3, pump house - pipe jacket, tar					
HA: 1 Not Analyzed						
9/23/15 400-2 141504239-0002	main line side by pump 5, pump house - pipe jacket, tar					
HA: 2 Not Analyzed						
9/23/15 401-1 141504239-0003	pump 4, pump house - pipe jacket, tar					
HA: 1 Not Analyzed						
9/23/15 401-2 141504239-0004	main line by pump 1, pump house - pipe jacket, tar					
HA: 2 Not Analyzed						
9/23/15 402-1 141504239-0005	pump 2, pump house - pipe jacket, tar	Black Non-Fibrous Homogeneous	100% Other	None	<1% Chrysotile	<1
HA: 1						

Analyst(s)
 Kelly Gallisdorfer (16)

Rhonda McGee
 Rhonda McGee, Laboratory Manager
 or other approved signatory

This laboratory is not responsible for % asbestos in total sample when the residue only is submitted for analysis. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.
 Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043
 Phone/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com> buffalolab@emsl.com

EMSL Order: 141504239
 CustomerID: AEVT25
 CustomerPO:
 ProjectID:

Attn: **John Puszta**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
 Fax:
 Received: 09/25/15 9:23 AM
 Analysis Date: 9/28/2015
 Collected: 9/23/2015

Project: AE475 / 722 Sturgeon Point Rd. Derby, NY 14047

**Test Report: Asbestos Analysis of Non-Friable Organically Bound materials by
 Transmission Electron Microscopy via NYS ELAP Method 198.4**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES	% TOTAL ASBESTOS
9/23/15 402-2 141504239-0006	main line between pump 2 & 3, pump house - pipe jacket, tar	Black Non-Fibrous Homogeneous	98.6% Other	None	1.4% Chrysotile	1.4
HA: 2						
9/23/15 500-1 141504239-0007	pump 5, pump house - pipe jacket on fiberglass					
HA: 1 Not Analyzed						
9/23/15 500-2 141504239-0008	pump 5, pump house - pipe jacket on fiberglass					
HA: 2 Not Analyzed						
9/23/15 600-1 141504239-0009	R-1 where roof of screen bldg - connects to pump house, caulk, black					
HA: 1 Not Analyzed						
9/23/15 600-2 141504239-0010	R-1 where roof of screen bldg - connects to pump house, caulk, black					
HA: 2 Not Analyzed						

Analyst(s)

Kelly Gallisdorfer (16)

Rhonda McGee

Rhonda McGee, Laboratory Manager
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11806

Initial report from 09/26/2015 13:07:09

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043
 Phone/Fax: (716) 651-0030 / (716) 651-0394
 http://www.EMSL.com buffalo@emsl.com

EMSL Order: 141504239
 CustomerID: AEVT25
 CustomerPO:
 ProjectID:

Attn: **John Puszta** Phone: (716) 982-3031
Aurora Environmental LLC Fax:
1850 Davis Rd. Received: 09/25/15 9:23 AM
West Falls, NY 14170 Analysis Date: 9/28/2015
 Collected: 9/23/2015

Project: **AE475 / 722 Sturgeon Point Rd. Derby, NY 14047**

**Test Report: Asbestos Analysis of Non-Friable Organically Bound materials by
 Transmission Electron Microscopy via NYS ELAP Method 198.4**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES	% TOTAL ASBESTOS
9/23/15 601-1 141504239-0011	R-2 - caulk, perimeter, covering bolts	Black Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 1						
9/23/15 601-2 141504239-0012	R-2 - caulk, perimeter, covering bolts	Black Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 2						
9/23/15 603-1 141504239-0013	South side - seam caulk	Gray Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 1						
9/23/15 603-2 141504239-0014	North side - seam caulk	Gray Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 2						
9/23/15 604-1 141504239-0015	North side screen bldg - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 1						
9/23/15 604-2 141504239-0016	North side screen bldg - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 2						

Analyst(s)

Kelly Gallisdorfer (16)

Rhonda McGee

Rhonda McGee, Laboratory Manager
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043
 Phone/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com> buffalolab@emsl.com

EMSL Order: 141504239
 CustomerID: AEVT25
 CustomerPO:
 ProjectID:

Attn: **John Pusztay**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
 Fax:
 Received: 09/25/15 9:23 AM
 Analysis Date: 9/28/2015
 Collected: 9/23/2015

Project: **AE475 / 722 Sturgeon Point Rd. Derby, NY 14047**

**Test Report: Asbestos Analysis of Non-Friable Organically Bound materials by
 Transmission Electron Microscopy via NYS ELAP Method 198.4**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES	% TOTAL ASBESTOS
9/23/15 605-1 141504239-0017	South side - compression filler	Black Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 1						
9/23/15 605-2 141504239-0018	North side - compression filler	Black Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 2						
9/23/15 606-1 141504239-0019	East side screen bldg - window glazing					
HA: 1 Not Analyzed						
9/23/15 606-2 141504239-0020	East side screen bldg - window glazing					
HA: 2 Not Analyzed						
9/23/15 607-1 141504239-0021	West side, pump house - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 1						
9/23/15 607-2 141504239-0022	West side, pump house - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 2						

Analyst(s)

Kelly Gallisdorfer (16)

Rhonda McGee

Rhonda McGee, Laboratory Manager
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043
 Phone/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com> buffalolab@emsl.com

EMSL Order: 141504239
 CustomerID: AEVT25
 CustomerPO:
 ProjectID:

Attn: **John Pusztay** Phone: (716) 982-3031
Aurora Environmental LLC Fax:
1850 Davis Rd. Received: 09/25/15 9:23 AM
West Falls, NY 14170 Analysis Date: 9/28/2015
 Collected: 9/23/2015

Project: AE475 / 722 Sturgeon Point Rd. Derby, NY 14047

**Test Report: Asbestos Analysis of Non-Friable Organically Bound materials by
 Transmission Electron Microscopy via NYS ELAP Method 198.4**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES	% TOTAL ASBESTOS
9/23/15 700-1 141504239-0023	R-1 - roofing, built-up	Black Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 1						
9/23/15 700-2 141504239-0024	R-1 - roofing, built-up	Black Non-Fibrous Homogeneous	100% Other	None	No Asbestos Detected	
HA: 2						
9/23/15 701-1 141504239-0025	R-1 - flashing					
HA: 1 Not Analyzed						
9/23/15 701-2 141504239-0026	R-1 - flashing					
HA: 2 Not Analyzed						
9/23/15 702-1 141504239-0027	R-1 - silver seal					
HA: 1 Not Analyzed						
9/23/15 702-2 141504239-0028	R-1 - silver seal					
HA: 2 Not Analyzed						

Analyst(s)
 Kelly Gallisdorfer (16)

Rhonda McGee
 Rhonda McGee, Laboratory Manager
 or other approved signatory

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 Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from: 09/26/2015 13:07:09



EMSL Analytical, Inc.

490 Rowley Road, Depew, NY 14043
Phone/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com> buffalolab@emsl.com

EMSL Order: 141504239
CustomerID: AEVT25
CustomerPO:
ProjectID:

Attn: **John Pusztay**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
Fax:
Received: 09/25/15 9:23 AM
Analysis Date: 9/28/2015
Collected: 9/23/2015

Project: AE475 / 722 Sturgeon Point Rd. Derby, NY 14047

**Test Report: Asbestos Analysis of Non-Friable Organically Bound materials by
Transmission Electron Microscopy via NYS ELAP Method 198.4**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES	% TOTAL ASBESTOS
9/23/15 703-1 141504239-0029	R-2 - roofing, bottom layer	Black/Yellow Fibrous Heterogeneous	100% Other	None	No Asbestos Detected	
HA: 1						
9/23/15 703-2 141504239-0030	R-2 - roofing, bottom layer	Black/Yellow Fibrous Heterogeneous	100% Other	None	No Asbestos Detected	
HA: 2						

Analyst(s)

Kelly Gallisdorfer (16)

Rhonda McGee

Rhonda McGee, Laboratory Manager
or other approved signatory

This laboratory is not responsible for % asbestos in total sample when the residue only is submitted for analysis. The above report relates only to the items tested. This report may not be reproduced, except in full, without written approval by EMSL Analytical, Inc. Samples received in good condition unless otherwise noted.
Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043
 Phone/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com> buffalolab@emsl.com

EMSL Order: 141504239
 CustomerID: AEVT25
 CustomerPO:
 ProjectID:

Attn: **John Puszta**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
 Fax:
 Received: 09/25/15 9:23 AM
 Analysis Date: 9/26/2015
 Collected: 9/23/2015

Project: **AE475 / 722 Sturgeon Point Rd. Derby, NY 14047**

**Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by PLM
 via the NY State ELAP 198.6 Method**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES
9/23/15 400-1 141504239-0001	pump 3, pump house - pipe jacket, tar	Black Fibrous Homogeneous	100% Other	None	Inconclusive : <1%Chrysotile Inconclusive - <1% Total
HA: 1					
9/23/15 400-2 141504239-0002	main line side by pump 5, pump house - pipe jacket, tar	Black Fibrous Homogeneous	92.0% Other	None	8.0% Chrysotile 8.0% Total
HA: 2					
9/23/15 401-1 141504239-0003	pump 4, pump house - pipe jacket, tar	Black Fibrous Homogeneous	84.1% Other	None	15.9% Chrysotile 15.9% Total
HA: 1					
9/23/15 401-2 141504239-0004	main line by pump 1, pump house - pipe jacket, tar				Positive Stop (Not Analyzed)
HA: 2					
9/23/15 402-1 141504239-0005	pump 2, pump house - pipe jacket, tar	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 402-2 141504239-0006	main line between pump 2 & 3, pump house - pipe jacket, tar	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					

Analyst(s)
 Shauna Strad (24)

Rhonda McGee
 Rhonda McGee, Laboratory Manager
 or other approved signatory

*Polarized Light Microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing. The test results contained within this report meet the requirements of NELAC unless otherwise noted. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. The above test report relates only to the items tested. EMSL bears no responsibility for sample collection activities or analytical method limitations. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043

Phone/Fax: (716) 651-0030 / (716) 651-0394

<http://www.EMSL.com>buffalolab@emsl.com

EMSL Order: 141504239

CustomerID: AEVT25

CustomerPO:

ProjectID:

Attn: **John Puszta**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
 Fax:
 Received: 09/25/15 9:23 AM
 Analysis Date: 9/26/2015
 Collected: 9/23/2015

Project: AE475 / 722 Sturgeon Point Rd. Derby, NY 14047

Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by PLM via the NY State ELAP 198.6 Method

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES
9/23/15 500-1 141504239-0007	pump 5, pump house - pipe jacket on fiberglass	Black Fibrous Homogeneous	90.6% Other	5.3 Glass	4.1% Chrysotile 4.1% Total
HA: 1					
9/23/15 500-2 141504239-0008	pump 5, pump house - pipe jacket on fiberglass				Positive Stop (Not Analyzed)
HA: 2					
9/23/15 600-1 141504239-0009	R-1 where roof of screen bldg - connects to pump house, caulk, black	Black Fibrous Homogeneous	91.8% Other	None	8.2% Chrysotile 8.2% Total
HA: 1					
9/23/15 600-2 141504239-0010	R-1 where roof of screen bldg - connects to pump house, caulk, black				Positive Stop (Not Analyzed)
HA: 2					
9/23/15 601-1 141504239-0011	R-2 - caulk, perimeter, covering bolts	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 601-2 141504239-0012	R-2 - caulk, perimeter, covering bolts	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					

Analyst(s)

Shauna Strnad (24)

Rhonda McGee, Laboratory Manager
or other approved signatory

*Polarized Light Microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing. The test results contained within this report meet the requirements of NELAC unless otherwise noted. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. The above test report relates only to the items tested. EMSL bears no responsibility for sample collection activities or analytical method limitations. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

Test Report PLMNYNOB-7.27.8 Printed: 9/29/2015 8:41:14 AM

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043
 Phone/Fax: (716) 651-0030 / (716) 651-0394
<http://www.EMSL.com> buffalolab@emsl.com

EMSL Order: 141504239
 CustomerID: AEVT25
 CustomerPO:
 ProjectID:

Attn: **John Puszta**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
 Fax:
 Received: 09/25/15 9:23 AM
 Analysis Date: 9/26/2015
 Collected: 9/23/2015

Project: **AE475 / 722 Sturgeon Point Rd. Derby, NY 14047**

**Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by PLM
 via the NY State ELAP 198.6 Method**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES
9/23/15 603-1 141504239-0013	South side - seam caulk	Gray Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 603-2 141504239-0014	North side - seam caulk	Gray Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					
9/23/15 604-1 141504239-0015	North side screen bldg - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 604-2 141504239-0016	North side screen bldg - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					
9/23/15 605-1 141504239-0017	South side - compression filler	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 605-2 141504239-0018	North side - compression filler	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					

Analyst(s)
 Shauna Strnad (24)

Rhonda McGee
 Rhonda McGee, Laboratory Manager
 or other approved signatory

*Polarized Light Microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing. The test results contained within this report meet the requirements of NELAC unless otherwise noted. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. The above test report relates only to the items tested. EMSL bears no responsibility for sample collection activities or analytical method limitations. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

**EMSL Analytical, Inc.**

490 Rowley Road, Depew, NY 14043

Phone/Fax: (716) 651-0030 / (716) 651-0394

<http://www.EMSL.com>buffalolab@emsl.com

EMSL Order: 141504239

CustomerID: AEVT25

CustomerPO:

ProjectID:

Attn: **John Puszta**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
 Fax:
 Received: 09/25/15 9:23 AM
 Analysis Date: 9/26/2015
 Collected: 9/23/2015

Project: AE475 / 722 Sturgeon Point Rd. Derby, NY 14047

**Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by PLM
 via the NY State ELAP 198.6 Method**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES
9/23/15 606-1 141504239-0019	East side screen bldg - window glazing	Tan Fibrous Homogeneous	98.9% Other	None	1.1% Chrysotile 1.1% Total
HA: 1					
9/23/15 606-2 141504239-0020	East side screen bldg - window glazing				Positive Stop (Not Analyzed)
HA: 2					
9/23/15 607-1 141504239-0021	West side, pump house - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 607-2 141504239-0022	West side, pump house - door caulk	Gray Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					
9/23/15 700-1 141504239-0023	R-1 - roofing, built-up	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 700-2 141504239-0024	R-1 - roofing, built-up	Black Non-Fibrous Homogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					

Analyst(s)

Shauna Strnad (24)

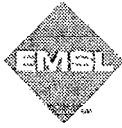
*Rhonda McGee*Rhonda McGee, Laboratory Manager
or other approved signatory

*Polarized Light Microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing. The test results contained within this report meet the requirements of NELAC unless otherwise noted. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. The above test report relates only to the items tested. EMSL bears no responsibility for sample collection activities or analytical method limitations. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09

Test Report PLMNYNOB-7.27.8 Printed: 9/29/2015 8:41:14 AM



EMSL Analytical, Inc.

490 Rowley Road, Depew, NY 14043
Phone/Fax: (716) 651-0030 / (716) 651-0394
http://www.EMSL.com buffalolab@emsl.com

EMSL Order: 141504239
CustomerID: AEVT25
CustomerPO:
ProjectID:

Attn: **John Pusztay**
Aurora Environmental LLC
1850 Davis Rd.
West Falls, NY 14170

Phone: (716) 982-3031
Fax:
Received: 09/25/15 9:23 AM
Analysis Date: 9/26/2015
Collected: 9/23/2015

Project: AE475 / 722 Sturgeon Point Rd. Derby, NY 14047

**Test Report: Asbestos Analysis of Non-Friable Organically Bound Materials by PLM
via the NY State ELAP 198.6 Method**

SAMPLE ID	DESCRIPTION	APPEARANCE	MATRIX MATERIAL	% NON-ASBESTOS FIBERS	ASBESTOS TYPES
9/23/15 701-1 141504239-0025	R-1 - flashing	Black Fibrous Homogeneous	89.9% Other	None	10.1% Chrysotile 10.1% Total
HA: 1					
9/23/15 701-2 141504239-0026	R-1 - flashing				Positive Stop (Not Analyzed)
HA: 2					
9/23/15 702-1 141504239-0027	R-1 - silver seal	Gray/Black Fibrous Homogeneous	83.9% Other	None	16.1% Chrysotile 16.1% Total
HA: 1					
9/23/15 702-2 141504239-0028	R-1 - silver seal				Positive Stop (Not Analyzed)
HA: 2					
9/23/15 703-1 141504239-0029	R-2 - roofing, bottom layer	Black/Yellow Non-Fibrous Heterogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 1					
9/23/15 703-2 141504239-0030	R-2 - roofing, bottom layer	Black/Yellow Non-Fibrous Heterogeneous	100% Other	None	Inconclusive: No Asbestos Detected
HA: 2					

Analyst(s)

Shauna Strnad (24)

Rhonda McGee

Rhonda McGee, Laboratory Manager
or other approved signatory

*Polarized Light Microscopy (PLM) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative Transmission Electron Microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing. The test results contained within this report meet the requirements of NELAC unless otherwise noted. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. The above test report relates only to the items tested. EMSL bears no responsibility for sample collection activities or analytical method limitations. Samples received in good condition unless otherwise noted.
Samples analyzed by EMSL Analytical, Inc. Depew, NY NYS ELAP 11606

Initial report from 09/26/2015 13:07:09



Aurora Environmental LLC

1850 Davis Road, West Falls, NY 14170
716-655-5800 www.auroraenviro.com

**Bulk Sample
Chain of Custody**

Client Name/Contact: Nussbamer & Clarke Inc. / Iain Remage

Client Address _____

Site Address 722 Sturgeon Point Rd.
Derby N.Y. 14047

Date 9/23/15 Job# AE475 Analysis Requested Lead-Paint chip's # of Samples 14 TAT 24hr Page 1 of 1

Sample ID#			Description	Sample Location
Date	HAN	#		
9/23/15	-	1	Traveling screen Paint chip - Blue paint	Screen Bldg.
	-	2	Traveling screen Paint chip - White paint	Screen Bldg.
	-	3	Tension spring Paint chip - White paint	Screen Bldg.
	-	4	concrete wall Paint chip - gray paint	Screen Bldg.
	-	5	concrete wall Paint chip - Blue paint	Screen Bldg.
	-	6	gas pipe Paint chip - Red paint	Screen Bldg.
	-	7	Structural steel Paint chip - gray paint	Screen Bldg.
	-	8	Door frame Paint chip - gray paint	Screen Bldg.
	-	9	Door lintel Paint chip - gray paint	Screen Bldg.
	-	10	water pipe Paint chip - Blue paint	Pump Station - Basement
	-	11	water spray Paint chip - Blue paint	Pump Station - Basement
	-	12	pump #5 Paint chip - Blue paint	Pump Station - Basement
	-	13	pump #4 Paint chip - Blue paint	Pump Station - Basement
	-	14	pump #2 Paint chip - Blue paint	Pump Station - Basement

15-10-00315



Due Date:
10/05/2015
(Monday)
AE

Notes and special instruction: Results to - * Email: Craig's at RAU275@yahoo.com

Craig Hibbs lid
Sampled by: print

Craig Hibbs lid
Signature

9/23/15
Date

Craig Hibbs lid
Relinquished by: print

Craig Hibbs lid
Signature

9/24/15
Date

SNicola
Received by: print

SNicola
Signature

10/2/15
Date

CH

EA



Environmental Hazards Services, L.L.C.
 7469 Whitepine Rd
 Richmond, VA 23237
 Telephone: 800.347.4010

Lead Paint Chip Analysis Report

Report Number: 15-10-00315

Client: Aurora Environmental LLC
 1850 Davis Rd
 West Falls, NY 14170

Received Date: 10/02/2015
Analyzed Date: 10/05/2015
Reported Date: 10/05/2015

Project/Test Address: 722 Sturgeon Point Rd.; Derby, NY 14047
Collection Date: 09/23/2015

Client Number:
 201282

Fax Number:

Laboratory Results

Lab Sample Number	Client Sample Number	Collection Location	Pb (ug/g) ppm	% Pb by Wt.	Narrative ID
15-10-00315-001	1	SCREEN BLDG	<40	<0.0040	
15-10-00315-002	2	SCREEN BLDG	<49	<0.0049	L04
15-10-00315-003	3	SCREEN BLDG	<38	<0.0038	
15-10-00315-004	4	SCREEN BLDG	64	0.0064	
15-10-00315-005	5	SCREEN BLDG	48	0.0048	
15-10-00315-006	6	SCREEN BLDG	210	0.021	
15-10-00315-007	7	SCREEN BLDG	340	0.034	
15-10-00315-008	8	SCREEN BLDG	62	0.0062	
15-10-00315-009	9	SCREEN BLDG	<37	<0.0037	
15-10-00315-010	10	PUMP STATION BASEMENT	290	0.029	
15-10-00315-011	11	PUMP STATION BASEMENT	540	0.054	

Environmental Hazards Services, L.L.C

Client Number: 201282
 Project/Test Address: 722 Sturgeon Point Rd.; Derby, NY 14047

Report Number: 15-10-00315

Lab Sample Number	Client Sample Number	Collection Location	Pb (ug/g) ppm	% Pb by Wt.	Narrative ID
15-10-00315-012	12	PUMP STATION BASEMENT	280	0.028	
15-10-00315-013	13	PUMP STATION BASEMENT	38000	3.8	
15-10-00315-014	14	PUMP STATION BASEMENT	620	0.062	

Sample Narratives:

L04: Sample contains substantial amounts of substrate which may affect the calculated results with units of ppm and % by weight.

Method: EPA SW846 7000B

Reviewed By Authorized Signatory:



Anthony Dee
 Metals/Organics Analyst

The HUD lead guidelines for lead paint chips are 0.50% by Weight, 5000 ppm, or 1.0 mg/cm². The Reporting Limit (RL) is 10.0 ug Total Pb. Paint chip area and results are calculated based on area measurements determined by the client. All internal quality control requirements associated with this batch were met, unless otherwise noted.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, area, etc., was provided by the client. Results reported above in mg/cm³ are calculated based on area supplied by client. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714.

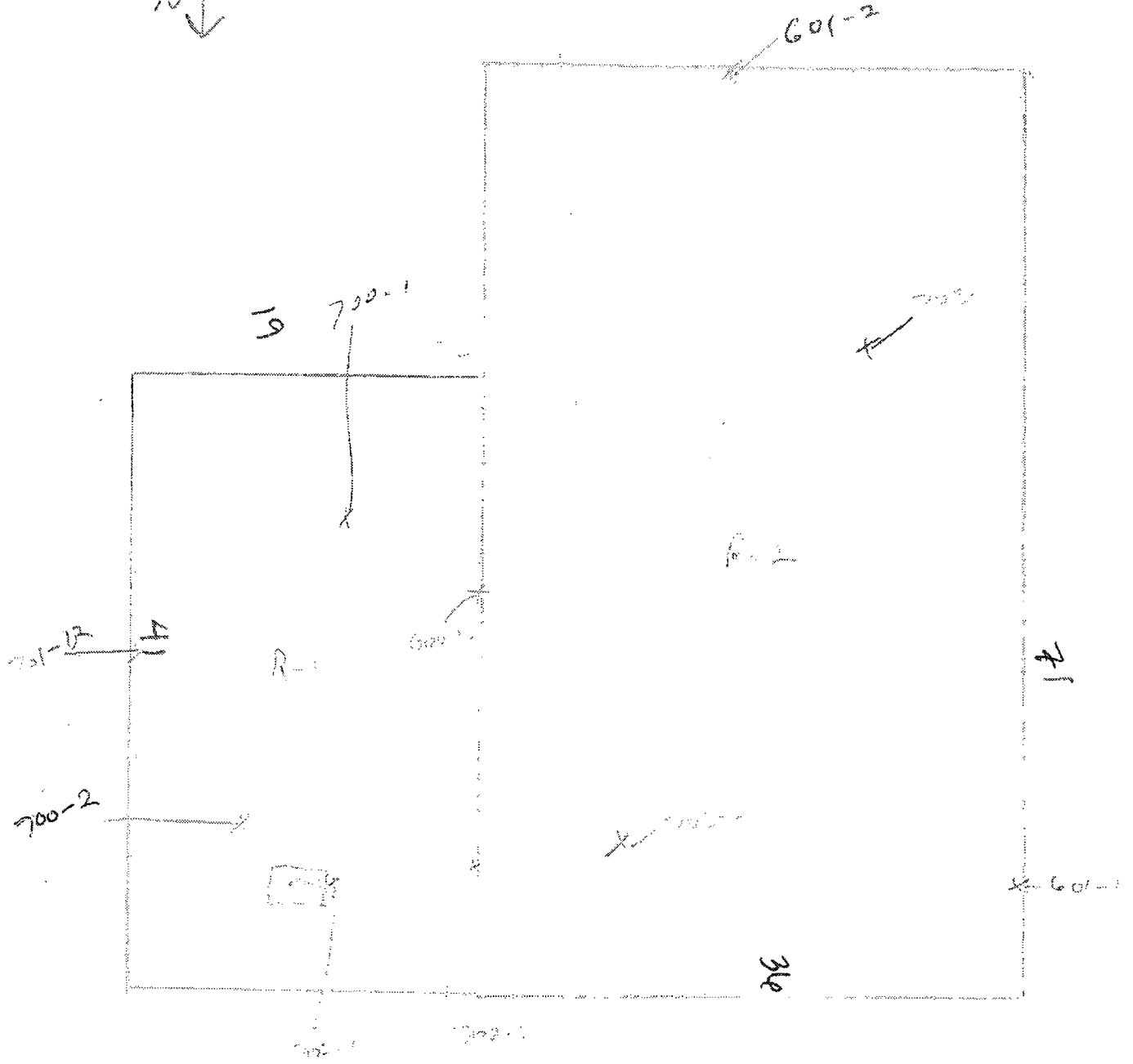
LEGEND	Pb= lead	ug = microgram	ppm = parts per million
	ug/g = micrograms per gram	Wt. = weight	

Appendix D

Sample Location maps



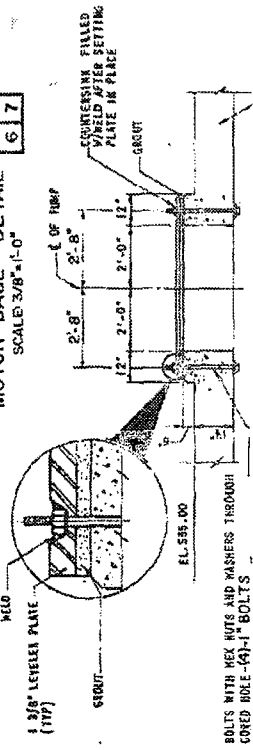
Row



VARIED BUILDING

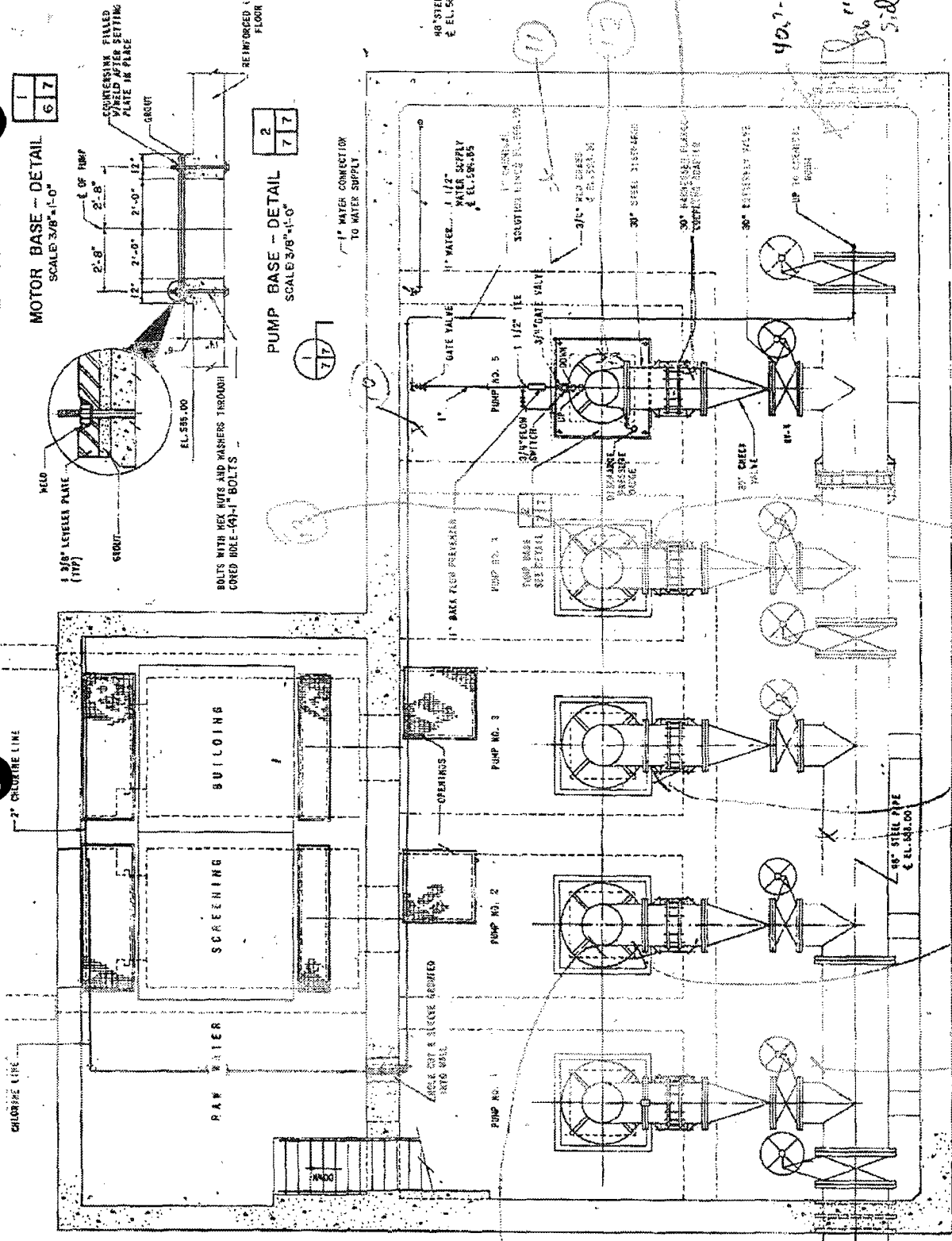
MOTOR BASE - DETAIL SCALE 3/8"=1'-0"

1	7
6	7



PUMP BASE - DETAIL SCALE 3/8"=1'-0"

2	7
7	7



401-1

402-1

402-2

401-2

BASEMENT PLAN SCALE 1/4"=1'-0"

NOTE: ALL SMALL PIPING OR ALL PIPING SUPPORTS BRACED FROM CEILING RESISTANT HANGERS.

APPENDIX G

SHOP DRAWINGS FOR 42-INCH TRANSMISSION MAIN



AMERICAN

DUCTILE IRON PIPE

THE RIGHT WAY

P.O. Box 2727
Birmingham, AL 35202-2727
Telephone: 1-800-442-2347
Fax: 1-800-442-2348
E-mail: adipcs@american-usa.com
WWW.AMERICAN-USA.COM

AMERICAN Ductile Iron Pipe Product Submittal Package

No cover information entered.

This is to certify materials furnished on this project by AMERICAN will comply with the ANSI/AWWA Standards listed below. Some components and other materials, including but not limited to various fittings, flanges, gaskets, fasteners, and bolts/nuts may be globally sourced and not of domestic manufacture. ANSI/AWWA Standards are the latest revisions as of this date.

Products Submitted in this Package Include:

- 1. Fastite Joint Pipe (pg.1)

ANSI/AWWA C150/A21.5

AWWA C151
AWWA C111
AWWA C104

42"

Class 53

Push-on joint

Fully gauged

Cement lined -
double thickness

Exterior - bituminous

APPROVED ()
APPROVED AS CORRECTED (X)
APPR. AS CORR.-RESUBMIT ()
REVISE AND RESUBMIT ()
NOT ACCEPTED ()

Checking is for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to the fabrication process or to techniques of construction and for coordination of the work of all trades.

NUSSBAUMER & CLARKE, INC.

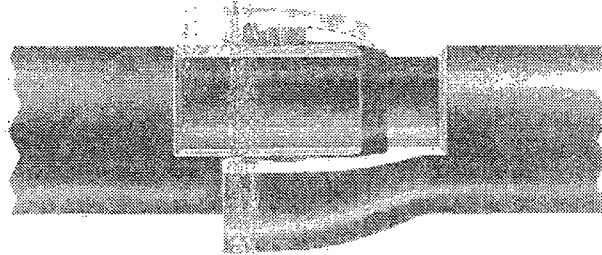
Date 8-1-16

By [Signature]



AMERICAN DUCTILE IRON PIPE

AMERICAN Fastite® Joint Pipe For Water, Sewage or Other Liquids



AMERICAN Fastite Joint Pipe in sizes 4" - 64" for water, sewage or other liquids has the proven long-life and high-strength qualities inherent in pipe produced centrifugally in accordance with AWWA C151. In addition, this significant AMERICAN development, a dependable, single gasket, push-on type joint meeting the requirements of AWWA C111, affords the customer lower joint cost and time-saving advantages in installation. It provides exceptional strength and flexibility and has been widely accepted by engineers, contractors and utility officials since the 1950s. For added flexibility during construction, and for possible elimination of bends, a liberal 5" allowable deflection is standard in all sizes through 30", offering 21" offset in a 20' length of pipe. Liberal deflection can also be provided in larger diameter pipe with standard and Special Fastite Deflection Belts.

The patented AMERICAN Fastite Joint embodies many advanced design features and is rated for a water working pressure of 150 psi. For specific conditions, ductile iron piping with this joint has been approved for much higher pressure conditions. The socket, which is scientifically designed with two gasket recesses and a dividing buttress, is manufactured to close tolerances so that the gasket is self-centered, securely confined, and firmly compressed for a permanent, tight, trouble-free joint. The Fastite joint seal, bubble-tight under vacuum and external pressure, becomes even tighter with the application of internal pressure due to a specially designed wedging surface in the socket.

Fastite Joint Assembly

The bell opening is slightly tapered to provide easy entry of the pipe end; the flared socket design permits liberal joint deflection.

The plain end of the pipe is tapered or rounded to facilitate entry into the bell and self-centering in the gasket. On pipe cut in the field, the plain end can be easily beveled and smoothed by the use of a portable grinding wheel or other suitable apparatus. Methods of cutting ductile iron pipe are described in Section 3.

A stripe is painted on the plain end of AMERICAN Fastite Joint Pipe to provide a visual means of checking the joint alignment and to assure proper insertion. See page 2-10 for detailed assembly instructions.

Fastite Gasket

The Fastite Joint sealing component—a molded synthetic rubber ring gasket of two hardnesses, shaped to fit the configuration of the gasket socket—is manufactured per all requirements of ANSI/AWWA C111/A21.11 and under AMERICAN's own rigid specifications, assuring closely controlled dimensional and hardness properties. The smaller end of the gasket is of harder rubber, approximately 85 durometer hardness, which provides a strong shoulder for self-centering on the gasket buttress, a permanent seal against cold flow, and protection from deterioration. The larger end of the gasket is of softer rubber, approximately 65 durometer hardness, providing ease of assembly and positive sealing. The design assures effective sealing at low or high pressures and in straight or deflected joint alignment. It also eliminates any concerns of infiltration or root intrusion, and assures positive sealing against negative pressure, thus preventing gasket "pullout" should a vacuum be created in the line.

A taper on the inside of the gasket allows the entering pipe to locate and center on the hard section and reduces friction loads during



subsequent assembly. The snug fit and the hard section of the gasket, in conjunction with the design of the buttress, act to restrain the gasket against dislodgment during assembly. Additional internal pressure results in increased tightness of the seal when pipe is either in straight alignment or deflected.

Gaskets made of SBR (Styrene Butadiene Rubber) are standard. For information on gaskets made of special types of rubber, for applications involving air or liquid temperatures in excess of 150°F, or for chemical, hydrocarbon or other special service applications, and for installations in contaminated soils where permeation through gaskets might be a concern, consult AMERICAN for recommendations. See Table 2-1.

Fastite Lubricant

AMERICAN Fastite Joint Lubricant is a non-toxic water soluble material imparting neither taste nor odor to the conveyed water and is ANSI/NSF 61 approved. The lubricant is suitable for use in hot or cold weather and will adhere to wet or dry pipe. AMERICAN Fastite Joint Pipe

can be assembled when submerged, though for such installation, special AMERICAN underwater joint lubricant is recommended. See Table No. 2-5 for appropriate lubricant quantities.

Fastite Joint Materials

Standard joint materials include Fastite plain rubber gaskets and a sufficient supply of Fastite joint lubricant. Fastite pipes are most often readily joined with available excavating equipment; however, assembly tools can be supplied by AMERICAN on a loan basis with a nominal deposit which is refundable upon return of tools in good condition.

Fittings

AMERICAN Fastite or Flex-Ring fittings and AMERICAN Mechanical Joint Fittings are used with Fastite Joint pipe. See Sections 4 and 5.

Coating and Lining

AMERICAN Fastite Joint Pipe can be furnished asphaltic coated, cement lined, or with special coating or lining where required. See Section 11.

Fastite Gaskets

Table No. 2-1

Common Name or Trade Name*	Chemical Name	Maximum Service Temperature**		Common Uses
		Water & Sewer	Air	
Plain Rubber	Styrene Butadiene Copolymer(SBR)	150°F	150°F	Fresh Water, Salt Water, Sanitary Sewage
Plain Rubber (conductive)	Styrene Butadiene Copolymer(SBR)	150°F	150°F	Electrical continuity for flowing of Service Water and Sewage
EPDM	Ethylene Propylene Diene Monomer	212°F	200°F	Water, Sewage, Ketones, Dilute Acids and Alkalies, Vegetable Oil, Alcohols, Air
Neoprene	Polychloroprene(CP)	200°F	180°F	Fresh Water, Sewage
Nitrile Buna-N	Acrylonitrile Butadiene(NBR)	150°F	150°F	Non-Aromatic Hydrocarbons, Petroleum Oil, Hydraulic Fluids, Fuel Oil, Fat, Oil, Grease†
Fluoroelastomer Fluorel Viton®**	FKM	212°F	300°F	Aromatic Hydrocarbons, Gasoline, Refined Petroleum Products, most Chemicals and Solvents, High Temp. Air (least permeable of all available Fastite gasket rubbers)

*AMERICAN reserves the right to furnish any Trade or Brand rubber for the chemical formulation specified
 **Temperature is in reference to conveyed fluid. Lubricating oil in air can adversely affect SBR and EPDM performance. SBR, Nitrile and Neoprene are not recommended for hot air exposure in wastewater treatment systems.
 ***Viton® is a registered trademark of DuPont Dow Elastomers.
 Refer to Section 11 for temperature and service capabilities of pipe fittings.
 †For higher temperatures or other special requirements, consult AMERICAN for recommendations regarding suitable gasket material.
 ‡This gasket rubber is chemically resistant in the non-potable water uses shown but is not as resistant to permeation in potable water applications as FKM.
 All Fastite gaskets made from the materials in the table above are suitable for use with water containing normal concentrations of organics. Where increased resistance to coloration is desired, neoprene or fluoroelastomer materials should be considered.



AMERICAN DUCTILE IRON PIPE

**AMERICAN Fastite® Joint
for Ductile Iron Pipe
ANSI/AWWA C111/A21.11
Standard Dimensions**

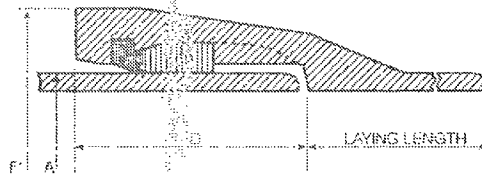


Table No. 2-2

Size in.	Nominal Laying Length ft.	Dimensions in Inches		
		A Outside Diameter	D Depth of Socket	F ¹ Bell O.D.
4	18	4.50	3.31	6.40
6	20	6.50	3.32	8.60
8	20	9.05	3.75	11.16
10	20	11.10	3.75	13.25
12	20	13.20	3.75	15.22
14	20	15.00	5.23	17.73
16	20	17.40	5.23	19.66
18	20	19.50	5.50	22.16
20	20	21.60	5.50	24.28
24	20	25.60	5.50	28.60
30	20	32.00	6.50	34.95
36	20	38.00	6.50	41.37
42	20	44.50	7.50	48.27
48	20	50.60	8.00	54.71
54	20	57.56	8.50	61.65
60	20	61.61	8.75	65.80
64	20	65.67	9.00	70.04

¹Dimensions subject to change at our option. Check AMERICAN if exact dimensions required.
See Section 3 for additional information on ductile iron pipe.
See Sections 4 and 7 for information on Fastite fittings.



AMERICAN Fastite® Joint Pipe
Allowable Joint Deflection



Table No. 2-3

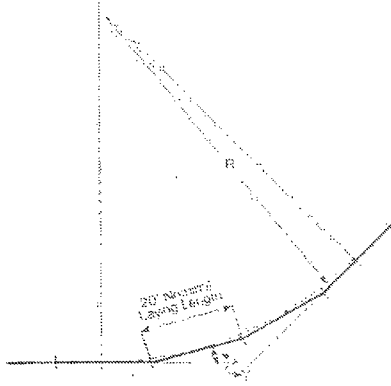
Size in.	Nominal Laying Length ft.	Maximum Recommended Deflection†					
		Standard Bell			Special Deflection Bell		
		X Offset per Nominal Length in.	Y Deflection Angle	Radius of Curve* ft.	X Offset per Nominal Length in.	Y Deflection Angle	Radius of Curve* ft.
4	15	10	5°	200	-	-	-
6	20	21	5°	230	-	-	-
8	20	21	5°	230	-	-	-
10	20	21	5°	230	-	-	-
12	20	21	5°	230	-	-	-
14	20	21	5°	230	-	-	-
16	20	21	5°	230	-	-	-
18	20	21	5°	230	-	-	-
20	20	21	5°	230	-	-	-
24	20	21	5°	230	-	-	-
30	20	21	5°	230	-	-	-
36	20	17	4°	285	21	5°	200
42	20	12	3°	380	21	5°	230
48	30	12	3°	390	17	4°	285
54	30	12	3°	380	17	4°	285
60	20	12	3°	380	17	4°	285
64	20	12	3°	380	17	4°	285

*An approximate radius of curve produced by a succession of nominal lengths of pipe fully deflected.
 †Special Deflection Bells must be specifically ordered and will be stamped with white lead lines for easy identification. For practical assembly, the joints should be assembled with the pipe in reasonably straight alignment. After joint assembly, the pipe may be deflected up to the maximum shown above. Offset distances are based on 20' lengths.

Maximum Allowable Separation

Table No. 2-4

Size in.	S Separation in.
4	1/2"
6	1/2"
8	3/4"
10	1"
12	1 1/4"
14	1 1/2"
16	1 3/4"
18	1 3/4"
20	1 3/4"
24	2 1/4"
30	2 3/4"
36	2 3/4"
42	2 3/4"
48	2 3/4"
54	2 3/4"
60	3 1/4"
64	3 1/4"



$R = \text{Radius of Curve (ft)}$
 $Y = \text{Deflection Angle (degrees)}$
 $\text{Radius of Curve} = \frac{\text{Nominal Laying Length}^2}{2 \times \text{Tangent} (Y - 2)}$

Maximum Allowable Separation, "S", in Standard Bell Pipe is approximately equal to the inside pipe diameter in inches times the sine of the deflection angle. This is provided for information only and should not be used to determine precise joint deflection.



AMERICAN Fastite® Joint Pipe Assembly Instructions

The AMERICAN Fastite Joint is a push-on type joint meeting all the rigorous requirements of AWWA C117. The ANSI/AWWA C600 Standard covers in detail the installation of ductile iron water mains, including assembly instructions for push-on joint pipe.

Field cutting of AMERICAN Ductile Iron Pipe can be easily performed, thus eliminating the necessity for factory-made special lengths of Fastite pipe. The plain end of Fastite pipe cut in the field requires little or no preparation for assembly into the socket of a mechanical joint fitting. Where a cut pipe is to be assembled into a Fastite socket, the required beveling or rounding of the plain end can be easily accomplished by the use of a portable grinding wheel or other suitable apparatus. Methods of cutting ductile iron pipe are described in Section 2.

The AMERICAN Fastite Joint requires only one joint component, the rubber gasket*, which when properly installed, fits snugly in the gasket recess in the bell socket. A special lubricant supplied with the pipe is applied to the plain end and the inside surface of the gasket before assembly. The pipe end is tapered or rounded to provide self-centering of the plain end in the gasket and ease of assembly. A circumferential stripe on the plain end provides a visual indication for checking the proper insertion of the joint. The stripe, shown in the photographs illustrating assembly methods, passes fully into the bell when the plain end is fully inserted into the socket

with the two lengths of pipe in straight alignment. Joints can then be safely deflected up to the extent shown in Table No. 2-3. In deflected joints, the stripe will typically be visible to some extent after assembly.

Easier assembly is effected if the pipe is suspended an inch or so off the bottom of the trench during the jointing operation.

The following instructions should be followed in order to properly assemble the joints and to fully realize the maximum speed and ease of assembly of the Fastite Joint:

1. Clean socket and plain end thoroughly, removing mud, gravel, or any other matter that might cause the front of the gasket to protrude into the path of the entering spigot.

2. Insert gasket fully into the gasket recess of the socket, large end of the gasket entering first. Gasket may be installed with one or two V-shaped folds as shown (Photo 1). After the gasket is in place at the bottom, the top of the gasket is positioned fully into the gasket recess. Gaskets and lubricant to be installed in very cold weather should be warmed first (as by storage in a heated equipment cab or pick-up, etc.) for optimum assembly.

3. Apply a thin film of regular AMERICAN Fastite Joint Lubricant to the rounded or tapered spigot end of the pipe, the immediate outside pipe surface between the stripe and the nose of the pipe (Photo 2), and also to the inside surface of the gasket. Special AMERICAN Fastite Joint Lubricant intended specifically for underwater or very wet installations can be supplied when requested.

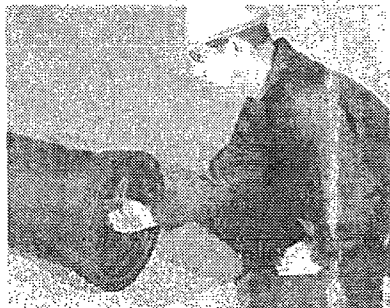


Photo 1

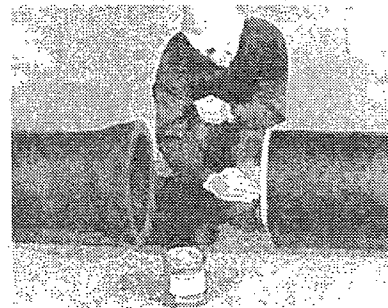


Photo 2

*Gaskets not used immediately should be stored in cool, dry place, out of direct sunlight.



Caution: If a spigot end contacts the ground or trench side after lubrication, any adhering dirt or rocks should be cleaned off and the area re-lubricated prior to assembly.

4. Insert the plain end in the socket. For optimum assembly it is preferable that the entering pipe be in reasonably straight alignment; however, the Fastite Joint may be assembled if necessary with the pipe deflected within its rated deflection. (Exception: if Fast-Grip gaskets are being used, straight alignment must be maintained.) Push the plain end into the socket using any of the applicable assembly methods described hereinafter. If the joint cannot be assembled with a moderate force, remove the pipe and check for the cause of the difficulty, such as improper positioning of gasket, insufficient or wrong type lubricant, dirt under or behind the gasket, dirt adhering to the pipe, or any other cause which would result in obstruction or increased friction between pipe end

and gasket surface. For assurance of proper assembly, a thin automotive, blade-type feeler gauge can also be used if desired for quick and easy probe confirmation of correctly installed axial gasket position around the joint.

5. "Backwards" installation. AMERICAN does not recommend "backward laying" (bells assembled over spigots, rather than spigots inserted into bells as pictured in this literature) of large-diameter ductile iron pipe in buried installations. AMERICAN can furnish bell and plain end fittings to minimize the need for backward pipe laying. Other devices such as sleeves and couplings may also be employed for this reason. However, if this condition cannot be avoided, we strongly recommend that installers contact AMERICAN for instructions on how to reduce the potential for problems that could occur when assembling pipe in this manner.

AMERICAN Pipe Assembly Mechanisms

In general, Fastite joints or other Fastite gasketed pipes may be readily pushed or pulled together without the need for complicated tools or substantial manpower. This is most often accomplished with the procedures discussed on page 2-14. In general, the joints of AMERICAN push-on pipes are purposefully "tight," and most joints require an assembly force of about 100 to 200 pounds or more of assembly force per inch of pipe diameter (i.e. a 12" joint might require about 12 x 100 or 1,200 pounds of assembly force).

In pulling operations, simply wrap a sound wire rope choker cable or nylon sling around the barrel of the entering pipe. Secure the thimble eye or other end loop of the choker to a suitably anchored pulling device (e.g. backhoe, come-along, etc.). Use the mechanism to pull the cable out in

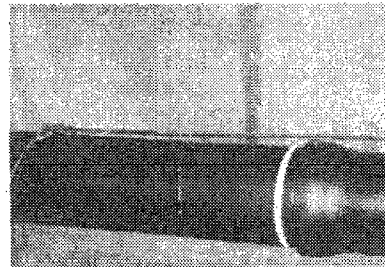


Photo 3

the assembly direction (Photo 3). Continue pulling the cable in a smooth, continuous motion until the joint is in the fully assembled position. If desired for special conditions, AMERICAN can furnish suitable, simple come-alongs and choker cables for man-



DUCTILE IRON PIPE

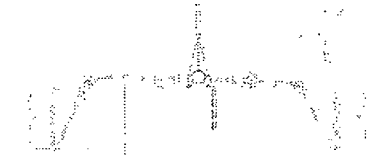


Figure 1
power assembly of most 4"-24" pipes (See Figure 1 and specify pipe sizes involved).

The joints may normally be disassembled in a similar manner, reversing the direction of the pull with the choke cable (Photo 4). It is also sometimes helpful to use rebating or wiggling deflection to aid in the disassembly of push-on joint pipes, particularly when pipes have been installed for some time prior to removal.

30"-64" Pipe

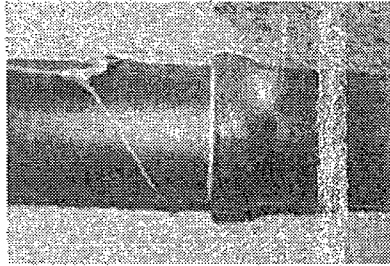


Photo 4

Large pipes are most often readily pushed or pulled together with heavy excavating/earthmoving equipment available on-site (see page 2-14). In cases where assembly of pipes by manpower is desired, AMERICAN can provide special assembly tools and rigging which can be used for assembling most pipes of all sizes (Photo 5). These tools consist of a heavy-duty roller chain hoist, a steel pipe-end hook and snatch block, and associated wire



Photo 5

rope and chain tackle (Photo 5) to attach all the rigging together to effect "double line" assembly from the top of the pipe (Photo 6). The snatch block pulley and twin line rigging approximately doubles the assembly force

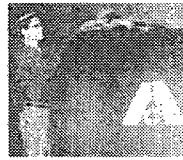


Photo 6

from the strong come-along, making possible the assembly of up to 64" full-length pipe joints from the top of the pipe (Photo 7).

Fittings and Short Pipes

Push-on fitting or



Photo 7

short pipe joint assembly is basically the same as that of standard length pipe, though special rigging may be necessary to hold these short items reasonably stable for assembly. See also Push-On Fittings Assembly Instructions in Section 4.

Field Rounding

Occasionally, field rounding of pipe ends may be necessary to accomplish assembly, particularly when large-diameter pipes are cut to be assembled into mechanical joints or couplings. Need for rounding in assembly of mechanical or stuffing-box-type joints can be predetermined by a difficulty in sliding the gland or end ring over the end of the pipe. Rounding may be accomplished in the following manner using a mechanical jack and shaped blocks. (Note: This procedure may also be used with the assemblies involving push-on joint pipe, fittings, valves, etc.; however, rounding is less frequently necessary for assembly of push-on joints.)

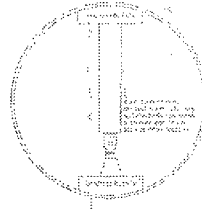


1. Measure/determine the minimum (minor) diameter of the ends to be rounded.

2. Place the jack and the shape blocks in line with the minor diameter as shown in the attached sketch using a sound 4"x4" spacer timber cut square to the required length to take up the space.

3. Apply a load carefully with the jack only until the "minimum diameter equals the maximum diameter," or until the pipe will easily slip over the end. No more jacking should be attempted or necessary - **DO NOT ATTEMPT TO PERMANENTLY ROUND ENDS.**

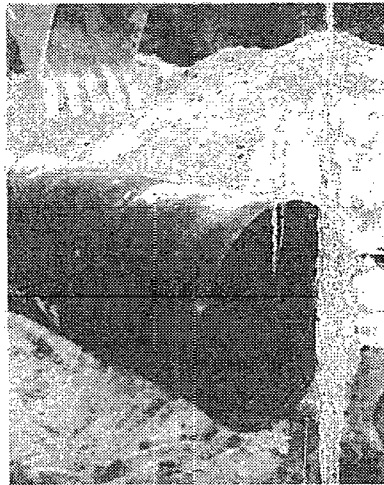
4. After the joint is completely assembled and the bolts (if involved) are uniformly tightened to the required torque, carefully relax and remove the jack and timbers from the pipe.



Note: Field rounding operations should be conducted without backfill on any part of large-diameter pipes and prior to encasing any part of pipe in concrete. If the inside of the pipe cannot be accessed to remove jacking materials, pipe ends can alternatively be rounded using external clamping means.

AMERICAN Fastite® Joint Lubricant Requirement by Size of Pipe

Table No. 2-5



64" AMERICAN Fastite Joint pipe being installed in a wastewater application.

Pipe Size in.	Approx. Pounds of Lubricant per Joint	Approx. No. of Joints per Pound of Lubricant
4	.03	33
6	.045	22
8	.06	17
10	.07	14
12	.08	12
14	.09	11
16	.11	9
18	.12	8
20	.14	7
24	.17	6
30	.20	5
36	.26	4
42	.44	2
48	.50	2
54	.59	2
60	.68	1
64	.71	1

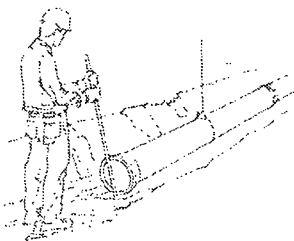


AMERICAN Fastite® Joint Common Assembly Methods

In seeking ways to take even greater advantage of the cost-reducing features of the Fastite Joint, utility contractors have developed other methods of assembling this joint without special tools. The following methods are described for the information of the user, who may elect to use them at his discretion, keeping in mind that these methods may not be effective for all installations and under all field conditions.

Spade or Crowbar Method

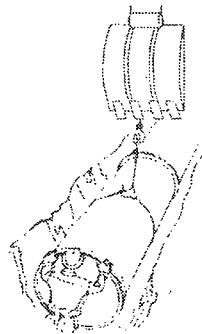
This is applicable to the smaller sizes of AMERICAN Fastite Joint Pipe, and consists of centering the lubricated end of the entering pipe in the gasket and then pushing against the bell face of the entering pipe with a spade or crowbar driven into the ground in front of the bell face. This method requires the trench bottom to be fairly firm soil. The method may not be effective in a rocky trench or with a trench that is soft, muddy or sandy. A wooden block between the bell face and the pry bar may increase the leverage. Easier assembly is effected if the pipe is suspended an inch or so off the bottom of the trench.



Spade or Crowbar Method

Backhoe and Heavy Equipment Methods

These methods are usually applicable to the intermediate and larger sizes of AMERICAN Fastite Joint Pipe where the bar method might not be effective. It consists of centering the end of the entering pipe in the gasket as the pipe to be assembled is suspended from the backhoe. Then it can be pulled into the adjoining socket with the pipe sling by moving the backhoe arm toward the previously assembled pipe. In other instances, the pipe may be assembled by placing the backhoe or other earth mover bucket or blade against the bell face of the entering pipe and pushing it into the socket. When pushing against the bell face, care should be taken to avoid very small contact areas and possible damage to the pipe bells or spigots. Wood cushions between the backhoe bucket and the pipe are particularly effective in preventing damage.



Backhoe and Heavy Equipment Methods

DMB4245

REVISION NO. 1

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4.00 [101.60MM]

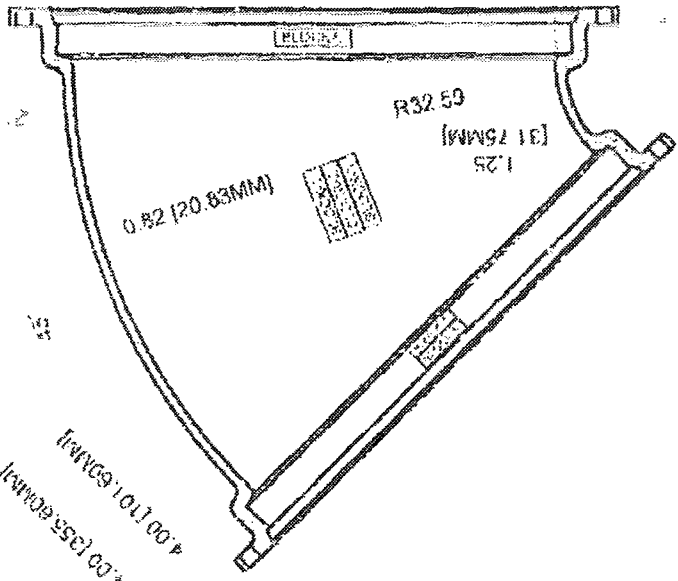
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19.00 [482.80MM]
[119.00] [3018.00]

2

45



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1.25 [31.75MM]

R32.50

Ø42.00 [1066.80MM]

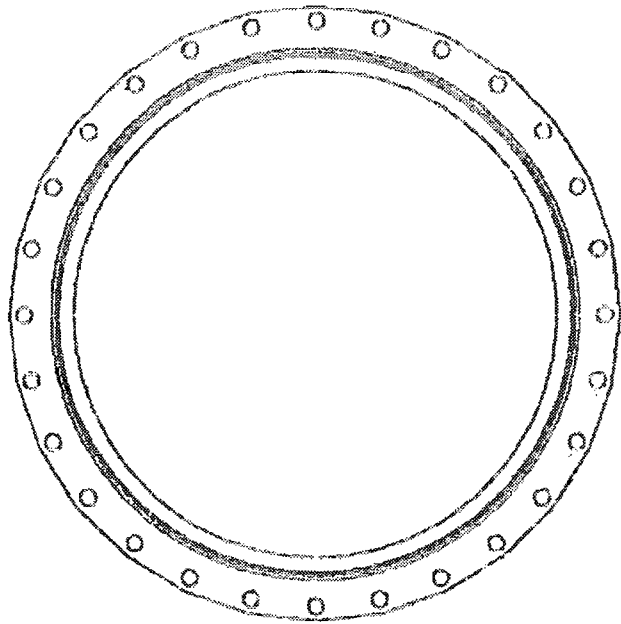
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Ø45.98 [1167.39] [1167.39]

Ø50.02 [1270.75] [1270.75]

53.12 [1348.25] [1348.25]

20



25 Holes x Ø1 [63.5]
[1304.00] [3288]
Evenly Spaced

- 1 The drawing designated as per ANSI/ASME Y14.2M-2003
- 2 Pressure rating: 250psi
- 3 The cast marks and heat numbers are as per Sigma's requirement which is written in a separate file

SIGMA	
DATE: 2004-09-23	TIME: 11:11
DESIGNER: NTS	SCALE: 1:1
CHECKER: [Blank]	APPROVER: [Blank]
PROJECT: [Blank]	DRAWING: DMB4245
PART: [Blank]	

OVAL

Cement lined - double thickness
Exterior - bituminous

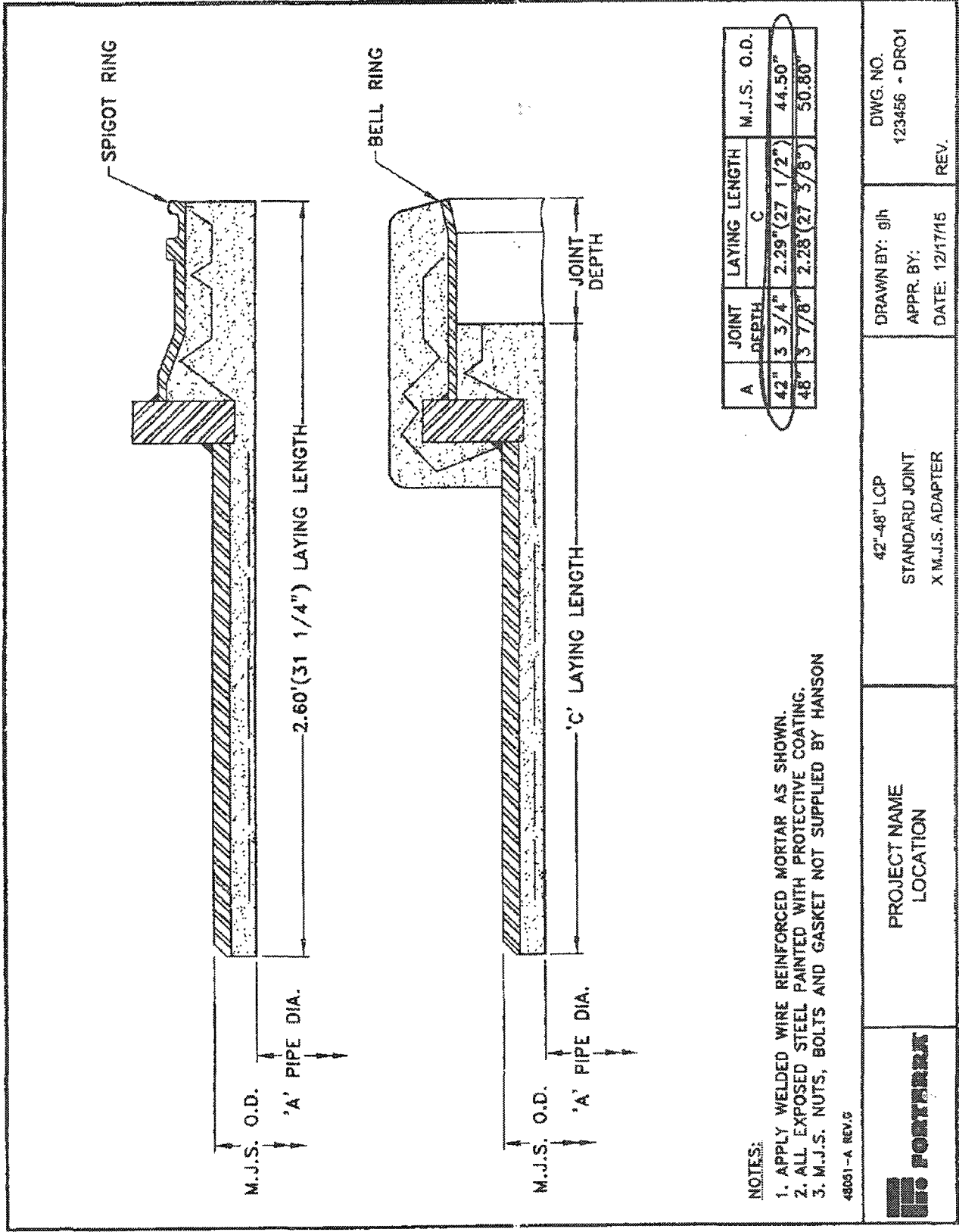
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APPROVED AS CORRECTED	<input checked="" type="checkbox"/>
APPR AS CORR.-RESUBMIT	()
REVISE AND RESUBMIT	()
NOT ACCEPTED	()

Accepted in accordance with the design con-
ditions of the Project and complies with the information
contained in the Contract Documents. Contractor is respon-
sible for all dimensions to be confirmed and correlated at
the site for information that pertains solely to the
construction process or to techniques of construction
for coordination of the work of all trades.

RUSSBAUMER & CLARKE, INC.

Date 8/10/10

By [Signature]



NOTES:

1. APPLY WELDED WIRE REINFORCED MORTAR AS SHOWN.
2. ALL EXPOSED STEEL PAINTED WITH PROTECTIVE COATING.
3. M.J.S. NUTS, BOLTS AND GASKET NOT SUPPLIED BY HANSON

48031 - A REV. 5

A	LAYING LENGTH		M.J.S. O.D.
	JOINT DEPTH	C	
42"	3 3/4"	2.29' (27 1/2")	44.50"
48"	3 7/8"	2.28' (27 3/8")	50.80"

	PROJECT NAME LOCATION	42"-48" LCP STANDARD JOINT X M.J.S. ADAPTER	DRAWN BY: gjh APPR. BY: DATE: 12/17/16
			DWG. NO. 123456 - DRO1
			REV.

Evan

APPROVED
APPROVED AS CORRECTED
APPR. AS CORR.-RESUBMIT
REVIEW AND RESUBMIT
NOT ACCEPTED

Contractor is for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site for information that pertains solely to the fabrication process or to techniques of construction; and for coordination of the work of all trades.

NUSSBAUMER & CLARKE, INC.

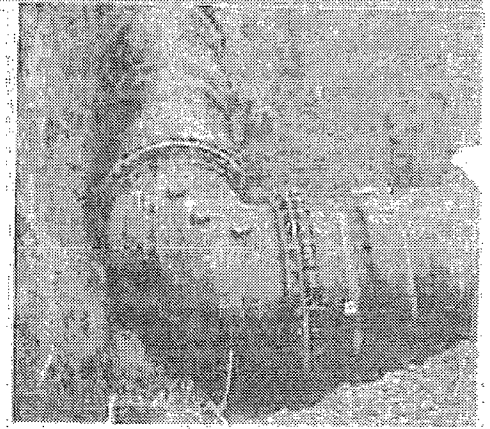
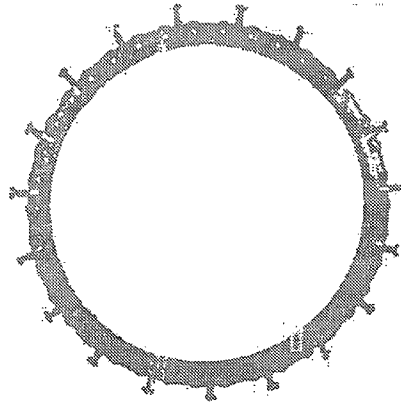
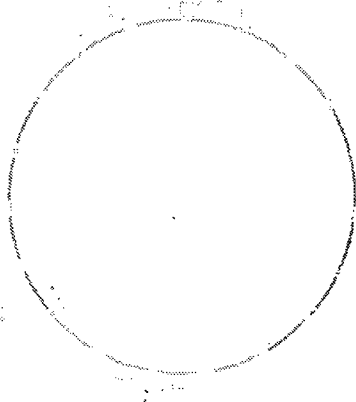
Date 8-1-16

By [Signature]



Quality - Service - Commitment - Delivered.

ONE-LOK™ MODEL SLIDE WEDGE RESTRAINT FOR DUCTILE IRON PIPE



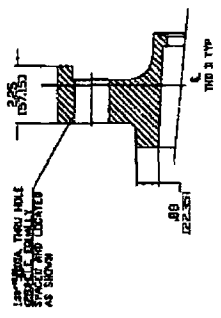
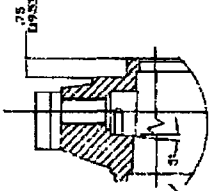
PRODUCT SPECIFICATIONS

- MATERIAL:**
 - Gland body, wedge inserts and break-off top actuating bolts are manufactured of high strength ductile iron in accordance with ASTM A536, Grade 65-45-12. Wedge inserts are heat-treated to a hardness of 370 BHN minimum.
- SIZE RANGE:**
 - 3" through 64"
- DIMENSION:**
 - Conform to ANSI/AWWA C111/A21.11 & ANSI/AWWA C153/A21.53 standards
- PRESSURE RATING:**
 - Sizes 3"-16" carry a 350 psi WWP and sizes 18"- 64" carry a 250 psi WWP while providing a minimum 2:1 factor of safety.
- COATING:**
 - Asphaltic black enamel
 - Electro-deposition "CORRSAFE™" available upon request. For further information, please refer to our CORRSAFE Product Information sheet at <http://www.sigmaco.com/pipe-restraint-product-coatings-linings/>
- APPROVALS:**
 - Underwriters Laboratories' listed in sizes 3"-36" and Factory Mutual approved in sizes 3"-12".
- DEFLECTION:**
 - 5° on 3"-12", 2° on 14"-16", 1.5° on 18"-30" and 1° on 36"- 64"
- TRACEABILITY:**
 - Gland body, wedge inserts and break-off top actuating bolts are individually cast with exact heat code information.
- INSTALLATION:**
 - In accordance with manufacturer's recommendation and applicable AWWA standards.



Note: This product is not designed to be used on plain end fittings.

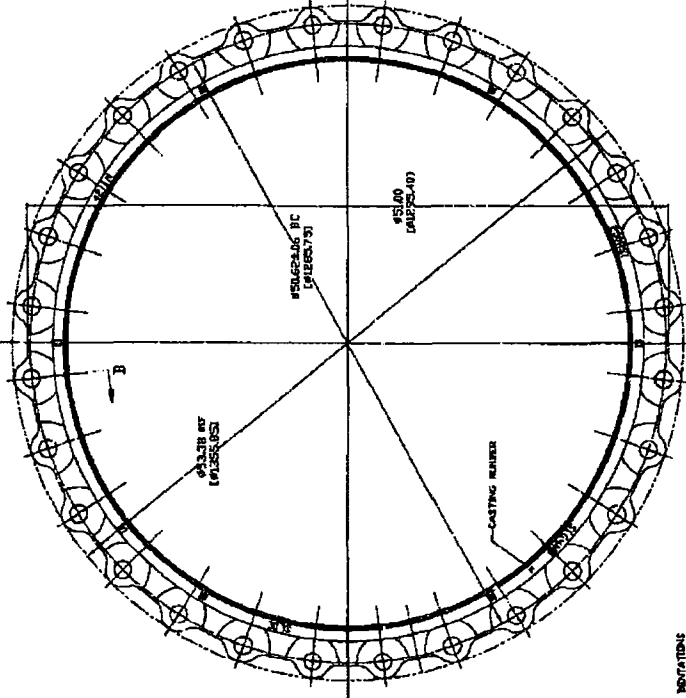
December 2016 SIGMA Corporation



ENLARGED VIEW
SCALE 2X

SECTION B-B
SCALE 2X

Ø 25 DIA. THRU HOLE
SPACERS EQUALLY SPACED
AROUND THE THRU HOLE



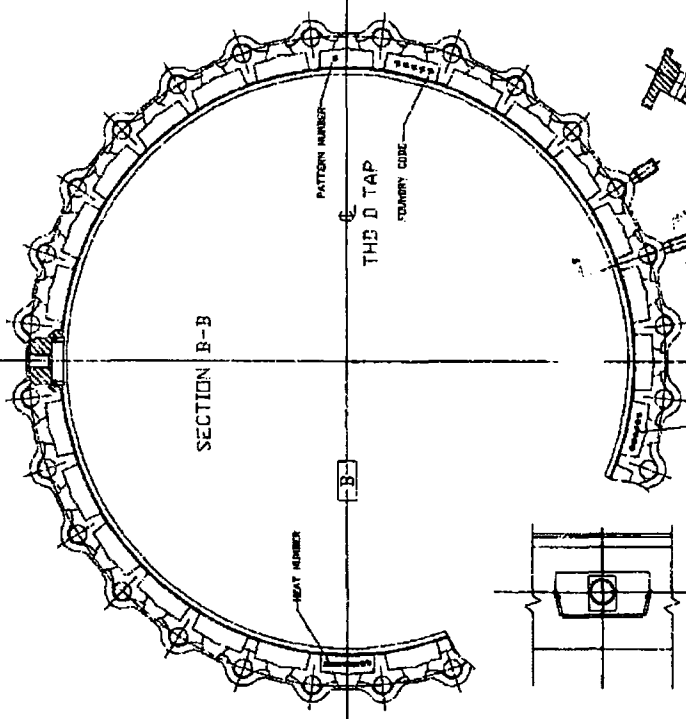
Ø 25 DIA. THRU HOLE
SPACERS EQUALLY SPACED
AROUND THE THRU HOLE

- NOTES
1. MATERIAL: DENTLE 300-1078, ASTM A534
 2. CAST NUMBER: LETTERS TO BE THE LARGEST SIZE THAT WILL FIT THE DESIGNATED LOCATION
 3. DIMENSIONS TO BE COORDINATED UNLESS OTHERWISE SPECIFIED
 4. ALL HOLES AND CHAMFERS TO BE .0015" UNLESS OTHERWISE SPECIFIED

ENLARGED VIEW X
SCALE 2X

SECTION A-A

VIEW C-C



SUBMITTAL

SIGMA CREAM RIDGE, NEW JERSEY	
PART NO. 42 REV. 10-18-1972	DRAWING NO. SLIDE 42
DATE 10-18-1972 DRAWN BY [blank] CHECKED BY [blank]	PROJECT NO. [blank]

CVAR

T bolts and nuts shall conform to
AWWA C111 and shall have a
fluorocarbon SC-1 coating.

Provide plain tipped rubber gaskets

APPROVED

APPROVED AS CORRECTED

REVISIONS CORR.-RESUBMIT

REVISIONS AND RESUBMIT

REVISIONS

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Contractor shall ensure compliance with the design con-
ditions and shall ensure compliance with the information
contained in the Contract Documents. Contractor is respon-
sible for the accuracy, to be confirmed and correlated at
the discretion of the techniques of construction.
for coordination of the work of all trades.

HOSSBAUMER & CLARKE, INC.

Date 8/2/16

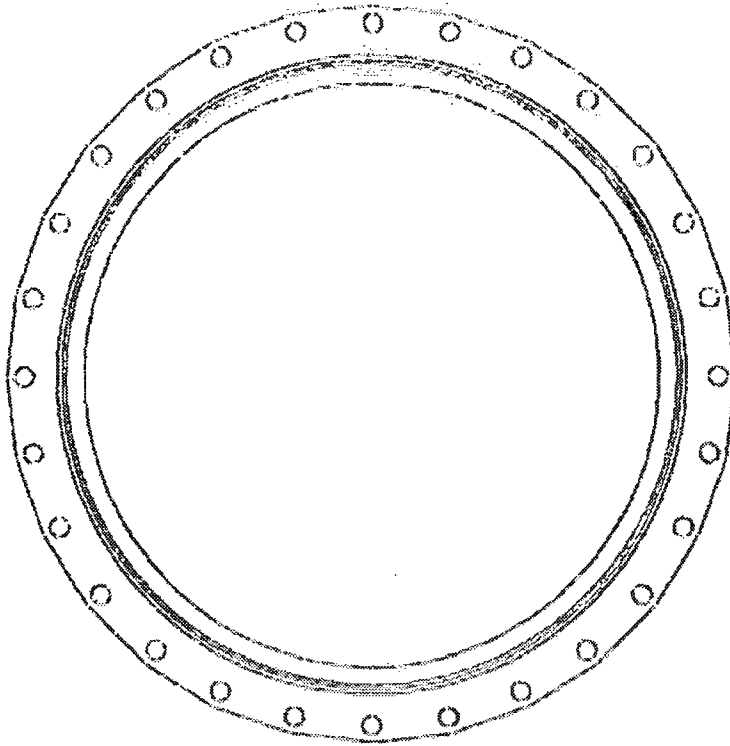
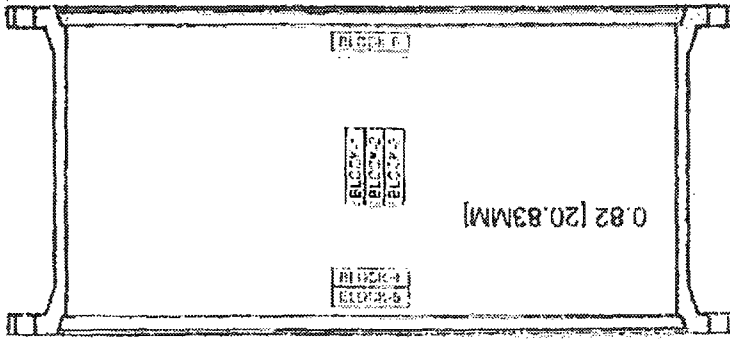
By [Signature]

DML42 | REVISION No. 1

24.00 [609.60MM]

1.45 ^{+0.12}
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28 Holes x Ø1.125
[Ø34.83 - 0.05 MM]
Equally Spaced



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Ø45.96 ^{+0.08} [-0.08] [Ø1167.38 ^{+2.03} MM]

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0.31 [7.87MM]

1.00 [25.40MM]

1. The drawing designed is as per ANSIAWMA C153/A1.53-88
2. Pressure rating: 250psi
3. The cast marks and heat numbers are as per Sigma's requirement which is written in a separate file

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DRAWN	
SCALE	1:1
PROJECT	28-Hole Flange
WORK CENTER	
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Cement lined - double thickness

Exterior - bituminous

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REVISE AND RESUBMIT

NOT ACCEPTED

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Responsible for conformance with the design conditions of the Project and compliance with the information in the Contract Documents. Contractor is responsible for information to be confirmed and correlated at site for information that pertains solely to the construction process or to techniques of construction and for coordination of the work of all trades.

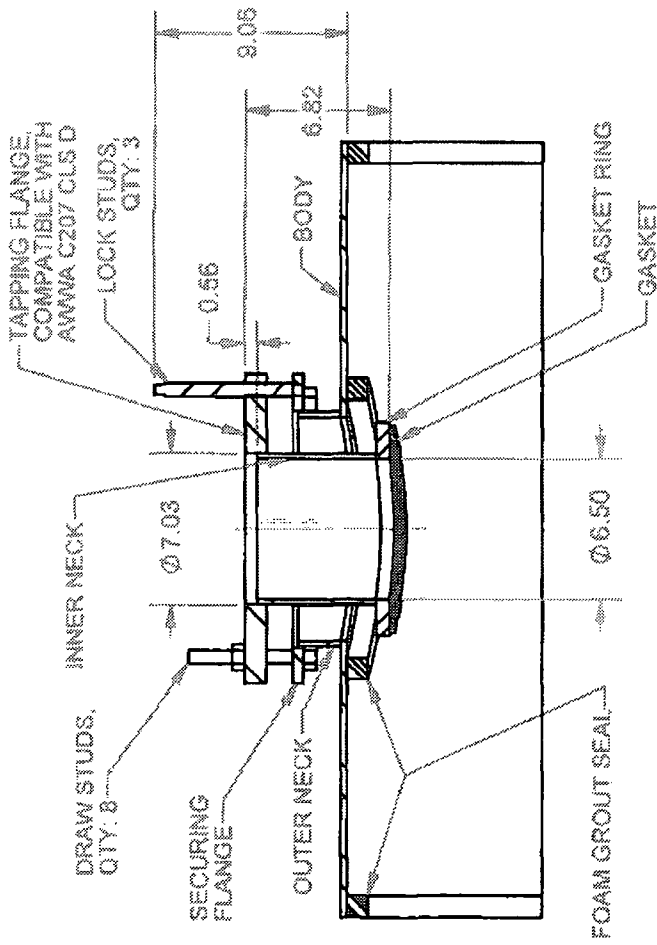
BUSSBAUMER & CLARKE, INC.

Date 8/12/16

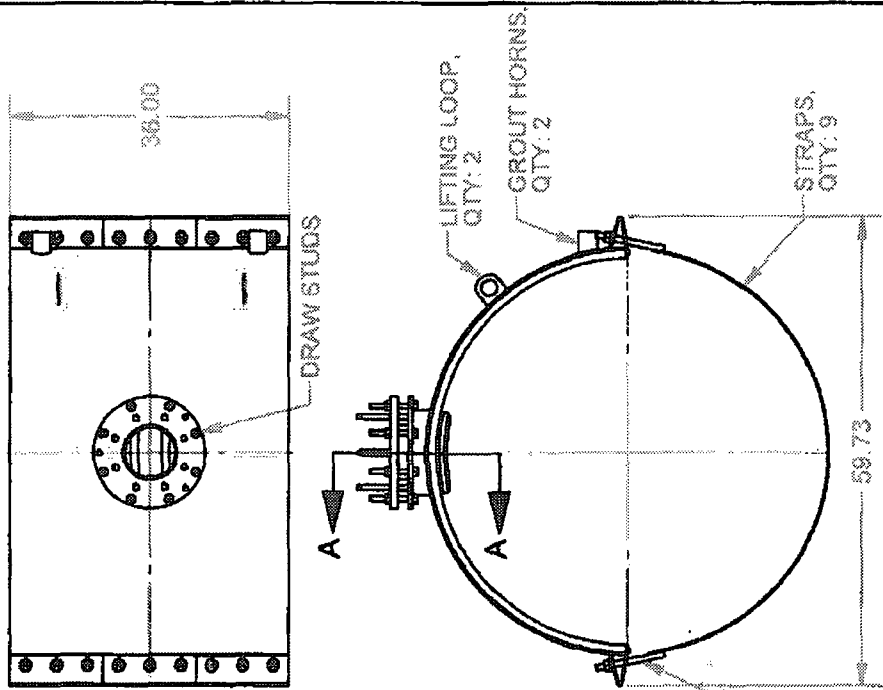
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CAD-032327

REV.	DESCRIPTION	DATE	APPROVED
0	INITIAL RELEASE	8/25/16	CRN



SECTION A-A
SCALE 1 : 8



3/4-UNC STUDS,
2 PER STRAP

- NOTES:
1. ALL MATERIAL ASTM A36 STEEL UNLESS NOTED OTHERWISE.
 2. COATING: FUSION BONDED EPOXY.
 3. FASTENERS PER CUSTOMER ORDER.
 4. CONCRETE PIPE OD: 49.25. STEEL CYLINDER OD: 47.25
 5. CUSTOMER TO REFERENCE THIS DRAWING WHEN REQUESTING QUOTE OR PLACING ORDER.

PROPERTY NOTICE	UNLESS OTHERWISE SPECIFIED	DRAWN	DATE	TITLE
THIS DRAWING CONTAINS CONFIDENTIAL PROPERTY INFORMATION AND IS THE PROPERTY OF ROMAC INC. IT IS TO BE USED ONLY FOR THE PURPOSE FOR WHICH IT WAS SUBMITTED AND SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF ROMAC INC. INC.	DIMENSIONS ARE IN INCHES TOLERANCES ARE ON 1 PL DECIMALS : 0.005 2 PL DECIMALS : 0.003 3 PL DECIMALS : 0.010 FRAC (OAS) : 1/16	CHRIS NICKLIS APPROVED Nils Troegsen	08/25/2016 8/25/2016	ROMAC INDUSTRIES INC. FTS435 - 42(49.25 - 47.25) X 6 - AWWA C207 CLS D - 175 PSI

DWG. NO.	REV. NO.	SCALE	SHEET
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Legacy Drawing #
DRAWING FILE NAME:
FTS435 - 42(49.25 - 47.25) X 6 - AWWA C207 CLS D - 175 PSI - CUSTOMER
DRAWING

MODEL CAS # CAD-032327
AUTHOR: Chris Nicklis

Over

Tapping Flange to be compatible with 6" Flange x NT tapping valve.

APPROVED ()

APPROVED AS CORRECTED (X)

APPROX 45% CONFORMANCE ()

REVISE AND RESUBMIT ()

NOT REVIEWED ()

It is the responsibility of the design con-

tractor to provide the correct information

to the contractor. The contractor is respon-

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Date 8/20/16 By W. Clark

ROSSBROWNER & CLARKE, INC.

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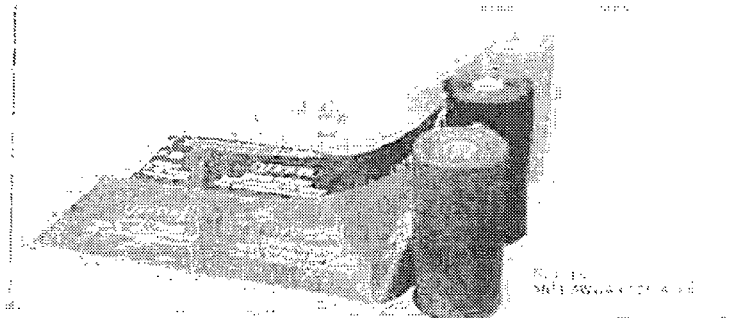


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- Hydrant Parts & Accessories

Polyethylene Encasement Tubing



Downloads

Catalog Pages

8 MIL LINEAR LOW DENSITY POLYWRAP® FOR DUCTILE IRON PIPE
 TRUMBULL POLYETHYLENE ENCASEMENT TUBING protects metallic pipe in corrosive soils. The tubing is slipped over the pipe, extended and lapped. An overlap of approximately two feet should be figured in calculating the total polywrap required. For example, about 20 feet of polywrap is required for each 18 foot length, or 22 feet for each 20 foot length.



Made per
ANSI/AWWA C105-A21.5.10

Black Polywrap

Pipe Size	Layflat Width	Weight lbs./ft.	Continuous		Perforated at 20ft.		Perforated at 22ft.		Lap Rolls Needed Per 1,000'
			Trumbull Item No.	Roll Length	Trumbull Item No.	Roll Length	Trumbull Item No.	Roll Length	
3"-8"	16"	0.108	388-9989	300 ft.	388-9942	300 ft.	388-9976	308 ft.	2
3"-8"	20"	0.132			388-9943	300 ft.	388-9961	308 ft.	3
10"	24"	0.159	388-9993	300 ft.	388-9945	300 ft.	388-9951	308 ft.	4
10"-12"	27"	0.178			388-9952	300 ft.	388-9962	308 ft.	4
14"-18"	34"	0.225	388-9996	300 ft.	388-9955	300 ft.	388-9966	308 ft.	6
16"-18"	37"	0.237	Special Order*		Special Order*		388-9967	308 ft.	7
18"-20"	41"	0.271	388-9998	300 ft.	388-9957	300 ft.	388-9969	308 ft.	7
24"	54"	0.358	388-9999	180 ft.	388-9958	180 ft.	388-9970	154 ft.	8
30"	67"	0.444	388-9985	150 ft.	Special Order*		388-9972	154 ft.	10
36"-42"	81"	0.536	388-9986	150 ft.	Special Order*		388-9974	154 ft.	15
48"	95"	0.629	388-9988	150 ft.	Special Order*		388-9975	154 ft.	17
54"-60"	108"	0.715	388-9987	150 ft.	Special Order*		388-9977	154 ft.	20

Pipe Size	Layflat Width	Weight lbs./ft.	Continuous		Perforated at 20ft.		Perforated at 22ft.		Tape Rolls Needed Per 1,000'***
			Trumbull Item No.	Roll Length	Trumbull Item No.	Roll Length	Trumbull Item No.	Roll Length	
64"	121"	0.901	388-9984	150 ft.	Special Order*		Special Order*		21

* Indicates other sizes, types and colors that are available as "special order", 4000# minimum per color, or size. See Price List for current sizes, colors & configurations stocked. 4 mil cross laminated Polywrap also available
 ** Above tape quantities are a guide. Actual amount required can vary due to a variety of conditions

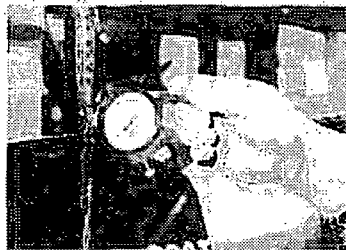
Colored Polywrap
 Stocked "Continuous" as shown below

Pipe Size	Layflat Width	Weight lbs./ft.	BLUE (Water)		GREEN (Sewer)		LAVENDER** (Reclaimed Water)		Tape Rolls Needed Per 1,000'***
			Trumbull Item No.	Roll Length	Trumbull Item No.	Roll Length	Trumbull Item No.	Roll Length	
3'-6"	20"	0.132	388-8705	300 ft.	388-8755	300 ft.	388-8805	300 ft.	3
10"-12"	27"	0.179	388-8710	300 ft.	388-8760	300 ft.	388-8810	300 ft.	4
14"-16"	34"	0.225	388-8715	300 ft.	388-8765	300 ft.	388-8815	300 ft.	6
18"-20"	41"	0.271	388-8717	300 ft.	Special Order*		388-8817	300 ft.	7
24"	54"	0.358	388-8720	150 ft.	388-8770	150 ft.	388-8820	150 ft.	8
30"	67"	0.444	388-8780	150 ft.	388-8777	150 ft.	388-8825	150 ft.	10
36"-42"	81"	0.518	388-8723	150 ft.	388-6471*	154 ft.	388-8828	150 ft.	13

* Indicates other sizes, types and colors that are available as "special order", 4000# minimum per color, or size. See Price List for current sizes, colors & configurations stocked. 4 mil cross-laminated Polywrap also available
 ** Lavender and purple Polywrap is printed with the text "Caution Reclaim and Water - Do Not Drink"
 *** Above tape quantities are a guide. Actual amount required can vary due to a variety of conditions
 * Item #388-6474 is perforated every 22 ft.

Clear Polywrap
 12 Mil weight

Pipe Size	Layflat Width	Pcfs. @	Clear	
			Trumbull Item No.	Weight
8"	20"	20 ft.	388-8605	200 ft.
12"	30"	20 ft.	388-8610	200 ft.



Sanitary Sewer Polywrap
 8 Mil. for 4" CI Sewer Pipe

Trumbull Polywrap is manufactured and inspected for compliance with ASTM D105 8 mil minimum thickness

		BLACK	
Pipe Size	Length	Trumbull Item No.	Weight
4"	12'	164-8941	400 lb

Polywrap Tape
 Multipurpose PVC Tape (APMD/UPC) certified for AWWA & plumbing applications

Trumbull Item No.	Roll Size	Thickness
164-8925	2' x 100'	10 mil



Product

- Cast Stainless Mud Valves
- Valve Position Indicators
- Meyer Box Lids
- Cast Stainless Mud Valves
- Valve Position Indicators
- Meyer Box Lids

Business

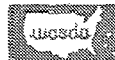
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- Indicators
- Box Lids
- Cast Stainless Mud Valves
- Valve Position Indicators
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Company Info

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APPROVED

APPROVED AS CORRECTED

APPR. AS CORR.-RESUBMIT

REVISION AND RESUBMIT

NOT APPROVED

(X)
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Checking for non-conformance with the design conditions of the Project and compliance with the information contained in the Contract Documents. Contractor is responsible for ensuring that the information is confirmed and correlated at all times. For information that pertains solely to the construction process or to techniques of construction, the coordination of the work of all trades.

NUSSBAUMER & CLARKE, INC.

Date 8/12/16

By [Signature]

S



Erie County Water Authority

295 Main Street, Rm. 350 • Buffalo, NY 14203-2494
716-849-8484 • Fax 716-849-8467

December 21, 2016

STC Construction, Inc.
63 Zoar Valley Road
Springville, NY 14141

Re: Contract No. NC-34
Sturgeon Point Raw Water Pump
Station Improvements
Project No. 201500175
Contract No. 16-26-12

Greetings:

Enclosed herewith please find an executed contract with the Erie County Water Authority for the above-referenced project in the contract award price of \$3,512,506.00.

Receipt of this contract constitutes your authority to commence work on this project. Please contact Len Kowalski, Sr. Distribution Engineer two working days prior to commencement.

On all future invoices, kindly refer to the contract number listed above which is reflected on the first page of the contract document.

Sincerely,

ERIE COUNTY WATER AUTHORITY

Jacqueline Mattina
Deputy Associate Attorney

JC:tf

Enclosure

cc: Russ Stoll
Len Kowalski
Gary Murray
Trish Fabozzi
Shari Zajdel
Karl Rohde, Nussbaumer & Clarke, Inc.



ERIE COUNTY WATER AUTHORITY
 AUTHORIZATION FORM
 For Approval/Execution of Documents
 (check which apply)

Contract: NC-034 **Project No.:** 201500175
Project Description: Sturgeon Point Outfall Rehabilitation

Item Description:

Agreement Professional Service Contract Amendment Change Order
 BCD NYSDOT Agreement Contract Documents Addendum
 Recommendation for Award of Contract Recommendation to Reject Bids
 Request for Proposals
 Other _____

Action Requested:

Board Authorization to Execute Legal Approval
 Board Authorization to Award Execution by the Chairman
 Board Authorization to Advertise for Bids Execution by the Secretary to the Authority
 Board Authorization to Solicit Request for Proposals
 Other _____

Approvals Needed:

APPROVED AS TO CONTENT:

Department Head *James J. Kowalik* Date: 12/16/16
 Risk Manager _____ Date: 12/19/2016
 Director of Administration _____ Date: _____
 Executive Engineer *Murphy* Date: 12/16/16

APPROVED AS TO FORM:

Legal *[Signature]* Date: 12/20/16

APPROVED FOR BOARD RESOLUTION:

Secretary to the Authority _____ Date: _____

Remarks: _____

Resolution Date: _____ **Item No:** _____



ERIE COUNTY WATER AUTHORITY
INTEROFFICE MEMORANDUM

December 16, 2016

To: Joseph T. Burns, Secretary to the Authority

From: Leonard F. Kowalski, Senior Distribution Engineer *LFK*

Subject: Contract NC-034
Sturgeon Point Raw Water Pump Station Improvements
ECWA Project No. 201500175

We are transmitting four Project Manuals along with a request for execution of the contract by the Chairman for the above referenced project.

The contract, previously awarded by ECWA to STC Construction, Inc. in the amount of \$3,512,506.00, been subsequently executed by the contractor. Included in the documents are STC Construction's Performance Bond and Payment Bond.

Following execution by the Chairman, one copy of the document is forwarded to the contractor along with a Notice to Proceed letter, one copy is forwarded to our consultant (Nussbaumer & Clarke, Inc.), one copy is forwarded to my attention, and a copy retained in Central Files.

LFK:jmf
Attachments
cc: R.Stoll
J.Meyers
CONT-NC-034-1501-186-B