Jones & Henry Engineers, Ltd.

Village of Ashville, Ohio

New Water Treatment Plant

ADDENDUM 3

December 30, 2025

Planholders of the Village of Ashville, Water Treatment Plant Improvement, project are hereby notified of the following amendments to the Contract Documents. This Addendum is hereby made a part of the Contract Documents.

GENERAL CLARIFICATIONS

A3-G1:
Question: Sheet A0.2 indicates the interior CMU walls at the Electrical room and Chemical room are to be a 2hr rated wall. Sheet A1.1 has these walls as wall type J2, non-rated. Confirm these walls should be type V2.
Response: Confirmed, Sheet A1.1 should list these walls as V2. Conformed Set will be updated to reflect the correct wall type.

A3-G2:
Question: Sheet A1.4, confirm the material call out Thin Stone Veneer should be 4" stone masonry veneer
Response: Confirmed, Conformed Set will be updated to reflect the correct note.

A3-G3:
Question: Sheet A1.7/5 calls out the water table as a calcium silicate unit, contradicting sheet A1.4, A1.5, A1.6 and spec 04435. Clarify the intended material for the water table.
Response: Water table unit is intended as a 'cast stone' product such as provided by Continental Cast Stone, fabricated to the illustrated profile.

A3-G4:
Question: Sheet A1.7/1,4 clarify the counter flashing material at the base thru wall flashing that appears to be attached to the face of the Cavity insulation board. The through wall flexible flashing at the base of the wall will be required to terminate at the face of the CMU backer wall with a termination bar to complete the air barrier system applied to the CMU backer wall.
Response: An EPDM thru-wall flashing with a stainless steel drip edge is acceptable.

A3-G5:
Question: Spec 04200, Part 2.06, B2, with the unknown arriscraft stone height and bond pattern that is to be chosen by the owner, confirm a wire bond Sure tie WS#4532 tapcon and WS#4515 hook are acceptable for this project. This will allow proper anchoring when the veneer stone bed joints do not align with the CMU backer wall bed joints.
Response: Arriscraft "Old Country" building stone is the Basis of Design. Contractor shall coordinate with manufacturer of the stone product/system that is ultimately used on the Project to ensure compatibility. Proposed Sure Tie system is acceptable but must be vetted against stone veneer manufacturer's requirements once that system has been selected.

A3-G6:
Question: Spec 04200, Part 2.06, B2, with the unknown arriscraft stone height and bond pattern that is to be chosen by the owner, confirm a wire bond Sure tie WS#4532 tapcon and WS#4515 hook are acceptable for this project. This will allow proper anchoring when the veneer stone bed joints do not align with the CMU backer wall bed joints.
Response: Arriscraft "Old Country" building stone is the Basis of Design. Contractor shall coordinate with manufacturer of the stone product/system that is ultimately used on the Project to ensure compatibility. Proposed Sure Tie system is acceptable but must be vetted against stone veneer manufacturer's requirements once that system has been selected.

A3-G7:
Question: Spec 04200, part 2.09, D, confirms that a stainless steel term bar is acceptable to terminate the thru wall flashing to the CMU backer wall completing the fluid applied air barrier system being applied to the face of the CMU.
Response: Acceptable pending compatibility with provided air barrier system requirements.

A3-G8:
Question: Sheet A1.7 details 1 and 5, confirm the indicated bolt on angle at the water table is required for the full bed veneer. This is not typical with the manufacturer's requirements. If this is required, should this location also require thru wall flashing due to compartmentalizing the air cavity.
Response: Angle is not required pending confirmation with stone veneer manufacturer's standard detailing. Head joint anchor is required.

A3-G9:
Question: Sheet A1.0 at the east wall of corridor 11 and room 4 the wall on column line b between columns 3.2-4.6 clarify if this location also receives a CMU only wall with a top of masonry being 5'4".
Response: CMU stops near Col. 4.6 at transition between exterior and interior conditions of wall along bb-line. Refer to Detail @ Interior Corner on A-1.8 and Interior Elevation – Liner Panel on A-1.9 Wall between Cols 3.2 and 4.6 is to be framed via the metal building system and standard light gauge interior framing as illustrated in the Drawings.

A3-G10:
Question: Spec 042000, part 2.01, C, Can a basis of design, color, and pattern be provided to allow for accurate pricing of the Arriscraft material and labor efficiency. The Arriscraft full bend stone has 87 different options to choose from. Typically the course at grade is an arriscraft limestone material to provide protection against water and salt damage at the base of the wall. Will a limestone material be required at this location?
Response: Arriscraft "Old Country" building stone is the Basis of Design. (LPA). Given the perimeter condition of this Project, a limestone starter course is not required.

SPECIFICATIONS

Section 13205, Replace with attached

Section 16902, Replace with attached

DRAWINGS

Drawing C-1.0, Replace with attached

Attachments: Drawing C-1.0
Specification 13205
Specification 16902

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED ON PAGE C-410 - 1 OF THE BID.

SECTION 13205
GLASS-COATED BOLTED STEEL GROUND STORAGE TANK

PART 1 GENERAL

1.01 SCOPE

A. This Section includes ground storage tank and accessories. This includes furnishing and erecting a glass-coated, bolted-steel water storage tank conforming to AWWA D103, including foundation, tank structure and tank appurtenances as shown on the contract drawings and described herein.

B. Work includes:

1. Design, fabrication, and erection of storage tank.
2. Design and construction of foundation.
3. Accessories.
4. Other Work specified herein.

1.02 SUBMITTALS

A. Submittal with Bid - Conceptual drawing of proposed tank showing significant dimensions, plate thicknesses, and preliminary dimensions of foundation shall be submitted with Bid.

B. Submittals shall be in accordance with the requirements of Section 01300 and shall include:

1. Shop Drawings for Review:
    a. Shop drawings of tank including details of joints. Shop drawings shall bear seal of Professional Engineer responsible for tank design.
    b. Product literature and details of construction for accessories.
    c. Submittals for concrete work shall be furnished under Sections 03200 and 03300.
    d. Shop drawings of cathodic protection system.
2. Information for the Record:
    a. Design certifications or calculations sealed by Professional Engineer responsible for tank design.
    b. Mill test certifications.
    c. Weld, welder, and welding operator qualifications.
    d. Construction report including radiograph test results.

e. Cathodic protection system test report.

f. Operation and maintenance manual for cathodic protection system.

1.03 QUALITY ASSURANCE

A. Design, fabrication, and erection of tank, foundation, and accessory work shall be in accordance with following standards:

1. "AWWA Standard for Welded Steel Tanks for Water Storage (D100)," American Water Works Association.

2. "Fabrication Details, Surface Finish Requirements, and Proper Design Considerations for Tanks and Vessels to be Lined For Immersion Service (RP0178)," National Association of Corrosion Engineers.

3. "Building Code Requirements for Reinforced Concrete (ACI 318) and Commentary (ACI 318R)," American Concrete Institute.

B. Design shall conform to Ohio Building Code (OBC). Structure shall be classified as Use-Group "U".

C. Design shall be performed by professional engineer registered in state of Site.

D. Contractor shall employ services of a welding supervisor independent of tank erection foreman.

E. Mill test certifications shall be provided for steel components. Heat numbers shall be clearly stamped on plates.

1.04 MANUFACTURERS

A. The tank contractor shall have a minimum of 10-years of successful experience in design fabrication and erection of factory applied glass coated, bolted tank systems. Structural design per the latest AWWA D103-19std. for Bolted Steel Water Storage Tanks.

B. Licensed Professional: Professional engineer experienced in design of specified Work and actively licensed in the state where the tank is located. The licensed professional shall furnish a copy of the Certificate of Authorization (or equivalent) for his/her company to practice engineering in the state of licensure.

C. Approved manufacturers are CST Storage and United Industries Group, Inc.

D. Other equipment manufacturers wishing to pre-quality as alternative suppliers shall submit the following to the engineer at least 14 days prior to the bid date and time.

1. A list of ten reference systems of similar type and capacity.

2. Detailed equipment drawings, specifications and product literature meeting the requirements of this specification.

3. NSF 61 certification for product materials.

4. A detailed list of variations required from the original design drawings and specifications.

1.05 WARRANTY

A. The tank manufacturer shall include a warranty on tank materials and workmanship for a specified period. As a minimum, the warranty shall provide assurance against defects in material, coatings, workmanship, and tank interior lining for a period of five (5) years, starting at the date of Substantial Completion.

PART 2 PRODUCTS

2.01 TANK DESIGN

A. Tank Size

1. The factory coated glass-fused-to-steel, bolt together tank shall have a nominal diameter of approximately 20 feet, with a nominal sidewall height (to roof eave) of approximately 24 feet.

B. Tank Capacity

1. Tank capacity shall be a minimum of 50,000 gallons (nominal, U.S. gallons).

C. Tank Design Standards

1. The materials, design, fabrication and erection of the bolt together tank shall conform to the AWWA Standard for "Factory Coated Bolted Steel Tanks For Water Storage" - ANSI/AWWA D103, latest revision.

2. The tank coating system shall conform solely to Section 12.4 of ANSI/AWWA D103. NOTE: Baked-on powder epoxy painted, galvanized, or stainless steel bolt-together tanks are not considered equal.

3. The vitreous coating on the tank, bolt head encapsulation material, and joint sealant shall have been approved for listing under ANSI/NSF Standard 61 for Indirect Additives.

4. The tank manufacturer shall be ISO-9001 certified to assure product quality.

5. The tank manufacturer shall undergo an annual FM (Factory Mutual) inspection of their glass-coated, bolted-steel tank factory & provide written proof thereof to assure quality.

D. Design loading criteria shall follow the applicable sections of the Ohio Building Code 2024 and AWWA D103-19, and as follows:

1. Specific Gravity: ____

2. Design Freeboard: 12 inches **(Addendum 3, Issued 12/30/2025)**

3. Risk Category: III **(Addendum 3, Issued 12/30/2025)**

4. Minimum Roof Live Load = 15 psf
5. Basic Wind Speed: 119 mph
    a. Wind Exposure: C
6. Ground Snow Load: 20 psf
    a. Snow Importance Factor: 1.2
    b. Snow Exposure Factor: 0.9
    c. Thermal Factor: 1.2
7. Seismic Design Category:
    a. Site Class: D
    b. Seismic Importance Factor: 1.50
    c. Seismic Design Category: C

2.02 MATERIALS

A. Plates and Sheets

1. Design requirements for mild strength steel shall be ASTM A1011 Grade 30 with a maximum allowable tensile stress of 14,566 psi per AWWA D103.
2. Design requirements for high strength steel shall be ASTM A1011 Grade 50 with a maximum allowable tensile stress of 26,000 psi per AWWA D103.
3. The annealing effect created from the glass coated firing process shall be considered in determining ultimate steel strength detailed in AWWA D103, Sections 5.3.
4. Multiple vertical bolt line sheets and plates of ASTM A1011 Grade 50 only shall be manufactured such that holes are staggered in the vertical bolt lines and that no two adjoining holes are in-line horizontally, except at the center of the sheet or plate.
    a. Bolt seam design shall generally be in accordance with the requirements of AWWA D103 section 5.5.2; bolt spacing may be adjusted in the vertical bolt lines to increase the net section and improve joint efficiency to a maximum of 85%.
    b. Double sheeting of tank panels shall not be permitted to achieve structural sidewall thickness requirements.

B. Rolled Structural Shapes

1. Material shall conform to minimum standards of ASTM A36 or ASTM A992.

C. Horizontal Wind Stiffeners

1. Design requirements for intermediate horizontal wind stiffeners shall be of the "web truss" design with extended tail to create multiple layers of stiffener, permitting wind load to transfer around tank.
2. Web truss stiffeners shall be of steel with hot dipped galvanized coating.
3. Rolled steel angle stiffeners are not permitted for intermediate stiffeners.

D. Bolt Fasteners

1. Bolts used in tank lap joints shall be 1/2" - 13 UNC- 2A rolled thread, and shall meet the minimum requirements of AWWA D103, Section 4.2.
2. Bolt Material
   a. SAE J429 (1” and 1-1/4” bolt length) heat treated to:
      1) Tensile Strength - 120,000 psi Min.
      2) Proof Load - 85,000 psi Min.
      3) Allowable shear stress – 29,454 psi.
   b. SAE J429 (>1-1/4” bolt length) heat treated to:
      1) Tensile Strength - 150,000 psi Min.
      2) Proof Load - 120,000 psi Min.
      3) Allowable shear stress - 36,818 psi.
3. Bolt Finish - Zinc, mechanically deposited.
   a. 2.0 mils minimum - under bolt head, on shank and threads
4. Bolt Head Encapsulation
   a. High impact polypropylene co-polymer encapsulation of entire bolt head up to the splines on the shank.
   b. Natural resin with UV (ultraviolet) light inhibitor. Color to be black.
5. All tank shell bolts shall be installed such that the head portion is located inside the tank, and the washer and nut are on the exterior.
6. All lap joint bolts shall be properly selected such that threaded portions will not be exposed in the "shear plane" between tank sheets. Also, bolt lengths shall be sized as to achieve a neat and uniform appearance. Excessive threads extending beyond the nut after torquing will not be permitted.
7. All lap joint bolts shall include a minimum of four (4) splines on the underside of the bolt head at the shank in order to resist rotation during torquing.
8. All exterior nuts, washers, and bolt threads will be covered with a sealer-filled protective plastic cover. Color to match tank shell.

E. Sealants

1. The lap joint sealant shall be a one component, moisture cured, polyurethane compound. The sealant shall be suitable for contact with potable water and meet applicable FDA Title 21 regulations, as well as, ANSI/NSF Additives Standard 61.
2. The sealant shall be used to seal lap joints, bolt connections and sheet edges. The sealant shall cure to a rubber like consistency, have excellent adhesion to the glass coating, have low shrinkage, and be suitable for interior and exterior exposure.
3. Sealant curing rate at 73° F and 50% RH.
4. Tack-free time: 6 to 8 hours.
5. Final cure time: 10 to 12 days.
6. The sealant shall be ESPC System Sealer No. 98, or equal.
7. Neoprene gaskets and tape type sealer shall not be used.

2.03 GLASS COATING

A. Surface Preparation

1. Following the decoiling and shearing process, sheets shall be steel grit-blasted on both sides to the equivalent of SSPC-10. Sand blasting and chemical pickling of steel sheets is not acceptable.
2. The surface anchor pattern shall be not less than 1.0 mil.
3. These sheets shall be evenly oiled on both sides to protect them from corrosion during fabrication.

B. Cleaning

1. Prior to initial preparation all four (4) exposed rectangular continuous sheet edges, including starter sheets, for each specific sheet radii shall be mechanically rounded in profile and adhere to The Porcelain Enameling Institute's Technical Manual PEI-101. All four (4) exposed sheet edges will then be coated with the same vitreous enamel as the glass coating of the sheets. Sheet edge encapsulation will have a minimum 5 mils thickness enamel coating. Rounded sheet edge encapsulation will have zero exposed uncoated steel. Sealer or glass overspray as edge coating shall not be acceptable.
2. After edgecoating and prior to application of the coating system, all sheets shall be thoroughly cleaned by a caustic wash and hot rinse process followed immediately by hot air drying.
3. Inspection of the sheets shall be made for traces of foreign matter or rust. Any such sheets shall be re-cleaned or grit-blasted to an acceptable level of quality.

C. Coating

1. All sheets shall receive one coat of a catalytic nickel-oxide glass precoat to both sides and then air dried.
2. Another coat of milled cobalt blue glass shall be applied to both sides of the sheets and then dried.
3. A third coat of milled titanium dioxide white glass shall be applied to all wetted surfaces which must be an 18 to 22 percent titanium dioxide reinforced mixture. The specified coating shall be Aquastore Vitrium. An acceptable alternate three coat two fire system must be submitted for approval prior to the bid.
4. The sheets shall then be fired at a minimum temperature of 1500˚ F in strict accordance with the manufacturer's ISO 9001 quality process control procedures, including firing time, furnace humidity, temperature control, etc.
5. The dry film interior coating thickness shall be 10.0 to 18.0 mils minimum. The finished inside color shall be white.
6. The dry film exterior coating thickness shall be 7.0 to 15.0 mils minimum. The finished exterior color shall be cobalt blue.
7. The same glass coating as applied to the sheet surfaces shall be applied to the exposed edges.

D. Factory Inspection

1. The manufacturer's quality system shall be ISO 9001 certified.
2. Chemical Resistance of Glass Coating
   a. Every batch of component frits shall be individually tested in accordance with PEI Test T-21 (Citric Acid at Room Temperature).
3. Factory Holiday Test
   a. A dry volt test using a minimum of 1100 volts is required.
   b. Frequency of the test shall be every sheet. Any sheet registering a discontinuity shall be rejected.
   c. All inside sheet surfaces shall be holiday free.
4. Measurement of Glass Thickness
   a. Glass thickness shall be measured using an electronic dry film thickness gage (magnetic induction type) approved by CST Storage. The thickness gage shall have a valid calibration record.
   b. Frequency of the test shall be every tenth sheet. The thickness of the glass shall be between 10.0 and 18.0 mils.
5. Measurement of Color

a. The exterior color of the sheets shall be measured using a colorimeter approved by tank manufacturer. The colorimeter shall have a valid calibration record.

b. Frequency of the test shall be every tenth sheet. The color must fall within the tolerance specified by the tank manufacturer, else the panel shall be rejected.

6. Impact Adherence Test

a. The adherence of the glass coating to the steel shall be tested in accordance with ASTM B916-01. Any sheet that has poor adherence shall be rejected.

b. Frequency of this test shall be one sheet per gage lot run minimum.

7. Fishscale Test

a. The glass coating shall be tested for fishscale by placing the full size production sheets in an oven at 400º F for one hour. The sheets will then be examined for signs of fishscale.

b. Any sheet exhibiting fishscale shall be rejected and all sheets from that gage lot will be similarly tested.

c. Frequency of this test shall be one sheet per gage lot run minimum.

E. Packaging

1. All approved sheets shall be protected from damage prior to packing for shipment.

2. Heavy paper or plastic foam sheets shall be placed between each panel to eliminate sheet-to-sheet abrasion during shipment.

3. Individual stacks of panels will be wrapped in heavy mil black plastic and steel banded to special wood pallets built to the roll-radius of the tank panels. This procedure eliminates contact or movement of finished panels during shipment.

4. Shipment from the factory to the job site will be by truck, hauling the tank components exclusively. No common carrier, drop, or transfer shipments.

2.04 FOUNDATION

A. The tank foundation is a part of this contract.

B. The tank foundation shall be designed by the manufacturer to safely sustain the structure and its live loads.

C. Tank footing design shall be based on the soil bearing capacity determined by the geotechnical analysis. A copy of the report is included in the Supplementary Conditions.

D. Footing designs for soil bearing strengths less than that specified, and those designs deviating from tank manufacturers standard shall be the responsibility of the Owner and his Engineer based on tank live and dead loading data provided by the tank manufacturer.

E. Tank Floor

1. The floor design is of reinforced concrete with an embedded glass coated steel starter sheet per AWWA D103-09 section 13.4.6 and the manufacturer's design, and is an integral element of the tank assembly; therefore the tank foundation and floor slab (performed in two separate pours) with embedded starter sheet shall be constructed by the tank supplier using manufacturer trained personnel regularly engaged in this type of tank construction.

2. Leveling of the starter ring shall be required and the maximum differential elevation within the ring shall not exceed one-eighth (1/8) inch, nor exceed one-sixteenth (1/16) inch within any ten (10) feet of length.

3. A leveling plate assembly, consisting of two 18" anchor rods (3/4" dia.) and a slotted plate (3 1/2" X 11" X 3/8" thk) shall be used to secure the starter ring, prior to encasement in concrete. Installation of the starter ring on concrete blocks or bricks, using shims for adjustment, is not permitted. The foundation with anchor bolts/leveling plates shall be a separate pour from the concrete floor.

4. Two water stop seals made of a butyl rubber elastomer special for this application shall be placed on the inside surface of the starter ring below the concrete floor line. These materials shall be installed as specified by the tank manufacturer.

2.05 STRUCTURE

A. Sidewall Structure

1. Field erection of the glass-coated, bolted-steel tank shall be in strict accordance with the procedures outlined in the manufacturer's erection manual, and performed by an authorized dealer of the tank manufacturer, regularly engaged in erection of these tanks.

2. Specialized erection jacks and building equipment developed and manufactured by the tank manufacturer shall be used to erect the tanks.

3. Particular care shall be taken in handling and bolting of the tank panels and members to avoid abrasion of the coating system. Prior to liquid test, all surface areas shall be visually inspected by the Engineer.

4. An electrical holiday test shall be performed during erection using a nine (9) volt leak detection device. All electrical leak points found on the inside surface shall be repaired in accordance with manufacturer's published touch up procedure using urethane sealer.

5. The placement of sealant on each panel may be inspected prior to placement of adjacent panels. However, the Engineer's inspection shall not relieve the bidder from his responsibility for liquid tightness.

6. No backfill shall be placed against the tank sidewall without prior written approval and design review of the tank manufacturer. Any backfill shall be placed according to the strict instructions of the tank manufacturer.

B. Roof

1. Tanks shall include a radially sectioned roof fabricated from glass-coated, bolted steel panels, as produced by the tank manufacturer, and shall be assembled in a similar manner as the sidewall panels utilizing the same sealant and bolting techniques, so as to assure a water/air tight assembly. The roof shall be clear span and self-supporting. Both live and dead loads shall be carried by the tank walls. The exterior coating finish shall be cobalt blue glass. The manufacturer shall furnish a roof opening which shall be placed near the outside tank ladder and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least twenty-four (24") inches in one direction and eighteen (18") inches in the other direction. The opening shall have a gasketed weather-tight cover.

C. Roof Vent

1. A properly sized vent assembly in accordance with AWWA D103 shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum possible rate of water fill or withdrawal, the resulting interior pressure or vacuum will not exceed 0.5" water column.

2. The overflow pipe shall not be considered to be a tank vent.

3. The vent shall be constructed of aluminum.

4. The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including an expanded aluminum screen (1/2 inch) opening. An insect screen of 24 mesh polyester monofilament shall be provided and designed to open should the screen become plugged by ice formation.

2.06 ACCESSORIES

A. Pipe Connections

1. Where pipe connections are shown to pass through tank panels, they shall be field located, saw cut, (acetylene torch cutting or welding is not permitted), and utilize an interior and exterior flange assembly. ESPC Sealer No. 98 shall be applied on any cut panel edges or bolt connections.

2. Overflow piping shall be 12 inch diameter schedule 80 PVC and shall have a stainless steel mesh screened end. **(Addendum 3, Issued 12/30/2025)**

3. Influent and effluent piping shall be 12 inch diameter ductile iron pipe. Influent riser pipe shall 12 inch diameter schedule 80 PVC be tank supported. **(Addendum 3, Issued 12/30/2025)**

B. Outside Tank Ladder

1. An outside tank ladder shall be furnished and installed as shown on the contract drawings.

2. Ladders shall be fabricated of aluminum and utilize grooved, skid-resistant rungs.

3. The exterior ladder will be equipped w/ an OSHA approved safety rail/cable.

C. Sidewall Access Manway

1. One sidewall access manway shall be provided as shown on the contract drawings in accordance with AWWA D-103.

2. Such manway shall be a minimum of 24 inches in diameter and shall include a properly designed reinforcing frame and cover plate. A davit to hold the cover plate, when opened, is required for tanks in excess of 38’ tall.

D. Interior Baffle Walls

1. The Manufacturer shall design and provide FRP baffle walls or other material standard to the Manufacturer. The baffles shall be located as shown on the Drawings.

E. Roof Penetrations

1. Roof shall include a 4-inch flanged sleeve for level sensor mounting. Locations are shown on the Drawings. **(Addendum 3, Issued 12/30/2025)**

F. Identification Plate A manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity. The nameplate shall be affixed to the tank exterior sidewall at a location approximately five (5') feet from grade elevation in a position of unobstructed view.

G. Cathodic Protection

1. The Manufacturer will provide a cathodic protection system consisting of sacrificial magnesium anodes which provide corrosion protection for the portions of the structure immersed in liquid. The anodes are equally spaced (to the nearest vertical bolt line) around the structure, attached to the floor, and bolted through existing shell sheet bolt holes. In special cases where anodes may be spaced differently, a layout plan will be provided as part of the submittal package. Lead wires and buss bars are used to ensure continuity between anodes and structure shell sheets.

2. Electrical continuity between all tank sidewall panels shall be the responsibility of the tank manufacturer.

3. The design life shall be calculated at 10 years. The cathodic protection system shall be designed for protection of uncoated steel surfaces in the product zone, including rebar within an uncoated concrete tank floor.

PART 3 EXECUTION

3.01 INSTALLATION

A. Tank shall be installed per the requirements of this specification and AWWA D103.

3.02 HYDROSTATIC TESTS

A. Following completion of erection and cleaning of the tank, the structure shall be tested for liquid tightness by filling tank to its overflow elevation.

B. Any leaks disclosed by this test shall be corrected by the erector in accordance with the manufacturer's recommendations.

C. Water required for testing shall be furnished by the owner at the time of tank erection completion, and at no charge to the tank erector. Disposal of test water shall be the responsibility of the owner.

D. Labor and equipment necessary for tank testing is to be included in the price of the tank manufacturer.

E. Test water shall be drained and discharged at acceptable location.

3.03 DISINFECTION

A. Paint shall be cured for minimum of 120 hours before cleaning and disinfection.

B. Disinfection shall be performed in conformance with specification Section 01610.

3.04 CONSTRUCTION REPORT

A. At conclusion of Work, Contractor shall prepare written construction report in accordance with AWWA D100. Report shall include actual measurements of construction tolerances when such is required.

PART 4 SPECIAL PROVISIONS

END OF SECTION

SECTION 16902
METERING AND CONTROL EQUIPMENT

PART 1 GENERAL

1.01 SCOPE

A. Work under this Section includes furnishing and installing all metering and control equipment which is part of the Plant Control System except the programmable controller system and the graphic user interface system.

B. All Work performed shall comply and be in accordance with all approved trade practices and manufacturer's recommendations.

1.02 SUBMITTALS

A. Submittals shall be in accordance with the requirements of Section 01300 and shall include:

1. Shop Drawings for Review:

a. Manufacturer's literature including model number, type, size, materials, quantity, connections, equipment number, mounting hardware, and installation information.

2. Information for the Record:

a. Equipment suppliers report that equipment is properly installed and satisfactory operation is obtained.

b. Software, cables, etc. for configuration, programming or operation of meters or equipment, minimum of two each is required.

c. Operation and maintenance manuals.

d. Schedule of Owner's training for all new equipment.

PART 2 PRODUCTS

2.01 PRODUCT REQUIREMENTS

A. All metering and control equipment shall be as indicated on the Drawings and as specified, and shall include, but not be limited to those devices hereinafter defined. Should additional devices be required, but not specifically indicated elsewhere, in order to affect the intent of the Contract Documents, such devices shall be furnished.

B. All metering and control equipment used for similar applications shall be the product of a single manufacturer.

C. All features and requirements listed in the individual instrument specifications are required.

D. All field instrument enclosures shall be NEMA 4X construction except in hazardous locations where the enclosures shall be NEMA 7 for Class I, Division 1, Group D service, unless otherwise noted. Equipment in hazardous locations shall indicate temperature rating as specified in the NEC.

E. All faces of panel mounted instruments shall be NEMA 4X construction except where the panel is located in a protected Control Room environment.

F. Whenever an "or equal" equipment item is proposed in lieu of that specified it will not be considered equal if it is of non-potted construction and the specified item is potted construction.

2.02 PERFORMANCE REQUIREMENTS

A. Intrinsically safe equipment shall be Factory Mutual approved for Class I, Division 1, Group D service.

B. Analog signals for input to a programmable controller system shall be isolated 4-20 mA DC and where required, current to current transducers or other device shall be furnished to produce an isolated signal to the programmable controller analog input modules.

C. Digital input signal sources shall provide an isolated contact rated at 5-amp minimum, 115 VAC, to the programmable controller system.

D. Power supplies shall be furnished for two-wire transmitters and other devices requiring DC power. No more than four loops shall be powered from one power supply. Separate power supplies shall be provided for duplicate instruments to ensure failure of one power supply will not inhibit operation of secondary equipment.

E. The Site is in an area subject to radio frequency activity. Any equipment sensitive to radio frequency interference (RFI) shall be provided with the proper RFI filters, be properly shielded and grounded, or otherwise protected to allow proper operation of the equipment.

2.03 POWER AND POWER CONDITIONING

A. Instrument Power Supply

Function:	Power for up to six 4-20 mADC signal loops. If more than six loops, use additional units of the same size.
Type:	Electronic Solid State
Input:	120 VAC, 60 Hz
Output:	As required, +/- 1 VDC adjustable
Load:	Load +/-0.05%, Line +/- 0.05%
Ripple and Noise:	0.5 mv RMS
Mounting:	Plug-in with octal base and screw terminals.

Features:	Overvoltage protection
Manufacturer:	Acopian, or equal
Model:	V"x"J Series ("x" is required output voltage)

2.04 SIGNAL CONDITIONING

A. Relay ((EY))

Function:	Logic Control
Type:	Solid-State Plug-in Relay
Contacts:	SPST-NO (Normally Open), solid-state output Rated for 2 A at 24 VDC (based on model selection)
Coil Voltage:	24 VDC
Mounting:	Plug-in, 8-pin octal base with DIN rail mountable socket
Manufacturer:	Allen-Bradley, or equal
Model:	700-HL Series with 700-HN153 socket.

B. Intrinsically Safe Relay (EY)

Function:	Intrinsically-safe isolation and logic control
Type:	Intrinsically-safe barrier relay
Contacts:	Two SPDT, 5 amp max.
Electrical Isolation:	According to IEC 61140, 300V
Coil Voltage:	120 VAC, 60 Hz, with LED indicator
Fault Indication:	Lead breakage and short circuit LED indicators for each control circuit
Mounting:	DIN rail
Manufacturer:	PEPPERL + FUCHS, or equal
Model:	KFA5-SR2-EX2.W

C. Signal Conditioner ((I/I))

Function:	Isolate and amplify instrument signal
Type:	Electronic solid state
Input Signal:	Analog
Value:	Field configurable from 0-10mV to 0-100 volt, and from 0-1mA to 0-100mA
Impedance:	Greater than 100K ohms (Voltage) 20 ohms typical (Current)
Output Signals:	Two, independent, isolated, analog
Value:	Field configurable, 4-20 mA
Accuracy:	< 20mV/2mA: ±0.5% of full scale, max > 20mV/2mA: ±0.2% of full scale, max
Stability:	+/-0.025%/degrees C typical
Response Time:	200 msec.
Isolation:	1500 VDC between channels, input, output, power
Temperature Range:	-15 to 60 degrees C
Power Supply:	120 VAC, 60 Hz
Consumption:	3W typical, 5W Max.

Mounting:	Din Rail (MD11)
Configuration:	Input range and output range shall be field adjustable without requiring additional appurtenances
Manufacturer:	Action Instruments, or equal
Model:	4390

2.05 SIGNAL CONTROL

A. Pushbutton ((HN))

Function:	Manual Operator Control
Type:	Momentary contact pushbutton unit, NEMA rating as required
Contacts:	1 NO and 1 NC minimum
	Provide contact arrangement as required to perform necessary functions
Contact Rating:	10 amps at 120 VAC, 60 Hz
Operator Type:	Momentary, color and designation per function
	Black - (Start, Run, or Open)
	Red - (Stop or Close)
	Green - (Silence)
Mounting:	Panel face, with legend plate
Manufacturer:	Allen-Bradley, or equal
Model:	800H

B. Pushbutton ((HN))

Function:	Manual Operator Control
Type:	Maintained contact push-pull unit, NEMA rating as required
Contacts:	1 NO and 1 NC minimum
	Provide contact arrangement as required to perform necessary functions
Contact Rating:	10 amps at 120 VAC, 60 Hz
Operator Type:	Maintained, color and designation per function
	Red - (Stop or Close)
	Red Mushroom Head (Emergency Stop)
Mounting:	Panel face, with legend plate
Manufacturer:	Allen-Bradley, or equal
Model:	800H

C. Selector Switch ((HS))

Function:	Manual Operator Control
Type:	2, 3, or 4 Position Selector Switch Unit, NEMA rating as required
Contacts:	1 NO and 1 NC maintained,
	Provide contact arrangement as required to perform necessary functions

Contact Rating:	10 amps at 120 VAC, 60 Hz
Operator Type:	Knob Lever, all positions maintained unless indicated otherwise
Operation:	Provide 2-3-4 position switch as required
	Where indicated, provide locking cylinder to prevent unauthorized switching
	Where indicated, provide spring return arrangement
Mounting:	Panel face, with legend plate
Manufacturer:	Allen-Bradley, or equal
Model:	800H

D. Pushbutton Station ((HN))

Function:	Manual operator control and status indication
Type:	Heavy Duty Operators within enclosure, “Stop” and “Start” pushbuttons, “Running” and “Alarm” indicator lights, UL listed, NEMA 4X
Contacts:	Hermetically sealed power reed contact blocks. Provide contact arrangement as required to perform necessary functions.
Contact Rating:	10 amps at 120 VAC, 60 Hz
Operator Type:	Type, color, and designation per function Stop - Red Illuminated Mushroom Head maintained contact push-pull unit Start - Black momentary contact pushbutton unit
	Running - Green transformer style push-to-test pilot light
Materials:	Stainless steel enclosure, heavy-duty operators
Cable:	Provide separately
Manufacturer:	Square D, or equal
Model:	KYSS enclosure, KR “Start” pushbutton, K2LR “Stop” mushroom button, KA5 contact blocks, and KT pilot lights

2.06 INDICATION

A. Pilot Indicator Light ((JJ))

Function:	Visual indication of process parameter, transformer type; push-to-test, 120 VAC
Type:	NEMA rating as required
Lamps:	120 VAC, 60 Hz, Incandescent, lens color as required GREEN (running or open) RED (stopped or close) AMBER (alarm) WHITE (status)
Mounting:	Front face of control panel with legend plate
Manufacturer:	Allen-Bradley, or equal
Model:	800H

B. Indicator ((*I))

Function:	Visual display of process variable
Type:	Electronic Solid State
Input:	Analog
Value:	4-20 mADC
Impedance:	100 ohms
Accuracy:	Linear, ±0.05% of calibrated span, +/- 1 count
Output:	Visual 4-1/2 digit digital display
Value:	As required by process, for scaling unit
Normal Mode:	55 db (typical) at 60 Hz
Common Mode:	110 db (min)
Power:	117 VAC +/- 10%, 47-400 Hz, 3.5 watts normal
Display:	LCD with backlight
Type:	High-Brightness, 0.56-inch LED
Polarity:	Positive assumed, negative sign displayed
Decimal Points:	Selected by internal “solder bridge”
Overrange:	An above range input will blank out all digits and display a “1”
Environmental:	
Operating:	+5 to 55 degrees C
Storage:	-20 to +85 degrees C
Dimensions:	4.5-inch W x 2.24-inch H x 2.92-inch D
Manufacturer:	Precision Digital Corporation, or equal
Model:	PD6600

C. Annunciator ((UA))

Function:	Indication of alarm functions
Type:	Solid State internally illuminated
Power Requirements:	1.7 watts per point
Logic Voltage:	Jumper selectable of 12, 24, 48 125 VDC, 120 VAC
Signal Input Voltage:	12 VDC
Input Current:	0.0018 mADC per point, optically isolated
Response Time:	50 m sec max
Output:	Visual indication on panel display, from point modules, two LED’s in parallel per point. All positions in the annunciator shall be equipped for alarm annunciation and retransmission of alarm signal. A separate dry contact shall be provided for common alarm signal.
Input Voltage:	120 VAC, 60 Hz
Humidity:	20-95% noncondensing relative humidity
Temperature Range:	Operative Limits: -4 to 122 degrees F (20 to 50 degrees C)
Operational Sequence:	TFS, First Out Sequence
Features:	Watertight door shall be provided when not installed within a control room environment
	All annunciators shall be complete in a single cabinet including; LED display, logic chassis, and power supply, and shall be capable of front panel mounting.

Nameplates:	Specific functions described in English Block type characters shall be front laser printed on translucent material measuring 3-inch H x 3-5/8-inch W with 9/32-inch characters.
Alarm Modules:	Plug-in modules shall consist of epoxy resin cards with copper printed circuits and gold flashed contacts. Any components on the cards shall be Solid State and shall be solder connected. There shall be one alarm module per input trouble contact and each module shall incorporate a switch to allow either NO or NC field contacts. All annunciator positions shall contain modules even though not assigned.
Manufacturer:	AMETEK, or equal
Model:	Series 90A Weathertight Door

2.07 LEVEL

A. Level Switch ((LS))

Function:	High or low level shutdown of equipment.
Type:	Displacement bulb with dry contact switch mechanism
Output Contacts:	SPDT, Non-inductive, 21 A at 120 VAC
Specific Gravity	0.6 - 1.5 g/cm^3
Process Temperature:	0 to 60 degrees C (32 to 140 degrees F)
Cable Length:	18 AWG, 41 strand, 20 feet minimum, length as required
Materials:	PVC with adjustable neoprene strain relief and butyl cosmetic ring
Manufacturer:	Magnetrol, or equal
Model:	T10

B. Level Element/Transmitter ((LE/LIT))

Function:	Determine level and transmit signal reflecting level to devices indicated.
Type:	Non-contacting, radar
Input Signal:	Analog process level
Range:	X to XX feet
Outputs Signals:	4-20 mA HART, scalable
Output Accuracy:	+/- 0.02 mA
Measurement Accuracy:	+/-2mm or 0.08 Inches. Provide NIST calibration Certificate
Repeatability:	+/-0.04 Inches
Ambient Temperature Effect:	0.006%/K
Frequency:	78 GHz
Fail Safe:	mA programmable high, low, or hold
Display:	Local Alphanumeric and multi-graphic liquid crystal with pushbuttons if available. If Local display is not visible or accessible please provide remote display that is 110VAC or 24 Volt powered.

Process Temperature:	-40 to 176 degrees F
Power Supply:	24 VDC Two Wire with built in surge protection
Ambient Temperature:	-40 to 176 degrees F
Enclosure:	Dual Compartment Housing NEMA 4X, or NEMA 6, IP67, as required. Sensor shall be FM approved Class I. Div. I explosion-proof
Antenna:	316 Stainless Steel Horn Antenna
Accessories:	Software with Hart modem or Bluetooth as required. Provide 316 Stainless Steel Flange or process seal on chemical tanks. Provide ANSI Flange as required on drawings. Provide mounting bracket installation on open tank applications. Provide echo mapping and data logging software if available
Manufacturer:	Rosemount, Endress Hauser, Vega, Siemens, or equal
Model:	S5408, FMR60, PULS64, Sitrans LR100

C. Level Element/Transmitter ((LE/LIT))

Function:	Determine level and transmit signal to devices indicated.
Type:	Pressure Transducer and Remote Display
Input Signal:	Analog process level
Range:	0 to 100 feet
Outputs Signals:	4-20 mA, scalable
Accuracy:	+/- 0.25%
Total Error Band:	+/- 0.5%
Protection Rating:	Sensor: IP68; Class I, Division 1 Remote Display: NEMA 4X
Operating Temperature:	-10 to 60 degrees C
Pressure Range	0 to 100 feet WC
Power Supply:	12 VDC
Enclosure:	316L Stainless Steel
Manufacturer:	Keller America, or equal
Model:	LevelRat, or equal

D. Spill/Leak Detection Element/Transmitter ((LE/LIT)

Function:	Detect the presence of any conductive liquids at any point along cable/sensor length.
Type:	Zone sensing cable with Modbus enabled sensor interface module
Outputs Contacts:	SPDT, 2 A at 120 VAC
Cable Diameter:	6.0mm
Continuity/Signal Wires:	2 x 26 AWG with
Sensing Wires:	2 x 30 AWG with conductive fluoropolymer jacket
Core:	Fluoropolymer
Breaking strength:	160 lbs
Cable Max. Continuous Operating Temperature:	194° F

Transmitter Enclosure:	NEMA 4X
Transmitter Power Requirements:	120 VAC, 3 Watts
Transmitter Operating Temperature Range:	32 - 122° F
Manufacturer:	nVent RAYCHEM, or equal
Model:	Cable: TT3000-1.5M, or equal Transmitter: TTSIM-1A

2.08 FLOW

A. Flow Element and Transmitter ((FE)/(FIT))

Function:	Measure, indicate and transmit the process flow in a full pipe. Meter must be a full bore meter with the magnetic field traversing the entire cross section of the flow tube. Insert magmeters or multiple single point probes inserted into a spool piece are not acceptable. Magnetic flow meter, operating based with high impedance electrodes. Flow tube with two coils mounted outside a 304 stainless steel tube, transmitter, interconnection cables and mounting hardware.
Type:	Pulsed DC magnetic induction with absolute zero stability
Size:	As specified on Drawings and in Schedule
Input Signal:	Analog Process Flow
Conductivity:	Minimum 5 Micromho/cm
Process Temperature:	-10 to +130 degrees F
Outputs:	Isolated 4-20 mA DC into 1,000 ohms. Scaled pulse outputs as standard.
	Flow direction, empty pipe detection, configurable status two contact outputs and one contact input for zero contact return.
Display:	Backlight LCD capable of simultaneously displaying flow rate and totalization
Calibration:	Provide with each flow meter a printout of two points of calibration starting at 1 FPS with measurement devices traceable to NIST standards. Three minute 1.5 x PN. All meters shall have internal meter verification diagnostic.
Accuracy:	+/- 0.25 percent rate or less (3 to 33 ft/sec)
	or +/- 0.005 percent FPS below 1 FPS
Repeatability:	+/- 0.1 percent of reading
Range ability:	100:1 turndown
Selectable Damping:	0.01 to 99.99 seconds, configurable
Low Flow cutoff:	0 to 10 percent, configurable
Electrodes:	Hastelloy C, bullet nosed electrodes on wastewater and flush electrodes on clean fluid. Titanium or others for chemical feed applications. It is the manufacturer's responsibility to provide materials comparable with the process medium.

Liner:	Polyurethane, hard rubber, neoprene for sewage meters. Ebonite, Teflon or Tefzel for all sludge meters (RAS, WAS, thickened). Meters 14 inches and larger shall have a polyurethane or hard rubber liner. All meters specified in potable water lines shall have an NSF 61 or FDA approved liner.
Flow Tube:	
0-12 inches:	304 or 316 stainless steel, meters 0-12 inches shall be capable of accidental submergence with 30 feet of cable to remote converter. Meters located below grade or in a meter vault shall be NEMA 6P rated with 100 foot cable. Cable shall be factory installed and potted. Compound mixtures installed in the field are not acceptable. All meter housings shall be of a welded design.
12-72 inches:	304 or 316 stainless steel shall be capable of continuous submergence in 30 feet of water with cable to remote converter.
End Connections:	
0-4 inches	150 lb. ANSI carbon steel or wafer design
6-24 inches	150 lb. ANSI carbon steel flanges
30-78 inches	Class D AWWA flanges
Lay length	All meters should comply with ISO 13359 lay lengths
Grounding:	All meters must be supplied with orifice type 316 stainless steel grounding rings. Grounding electrodes are not acceptable. Meters shall have 316 grounding straps.
Converter:	Microprocessor based remote converter. Refer to drawings for cable length. Only one conduit between flow tube and converter. Three totalizers for forward, reverse and net.
Power Requirements:	110/120 VAC 50/60 Hz.
Transmitter Enclosure:	NEMA 4X die cast aluminum rectangular housing immune to RFI inference, with flow rate and totalization indication.
Electrical Rating	All meters installed in a wastewater treatment plant shall be FM approved Class 1 Division 2 Grounds A, B, C and D. Meter shown on drawings in Class 1 Div 1 area shall be rated for that area.
Ambient Temperature:	-40 to 150 degrees F
Manufacturer:	Endress & Hauser 53W Promag, Rosemount 8700 Series or Johnson Yokagawa ADmag, Siemens 3100, Toshiba LF654 or equal. **(Addendum 3, Issued 12/30/2025)**
Model:	Manufacturer shall be ISO 9001 compliant and meters shall have a two year standard warranty. All meters shall have a stainless steel tag. All meters shall have internal meter verification along with coating, ground loop and process noise diagnostics. All meters shall have empty pipe direction with contact inputs for zero return.

2.09 RESERVED

2.10 RESERVED

2.11 RESERVED

2.12 ANALYTICAL

A. pH Analyzer ((AE)/(AIT))

Function:	Continuous pH monitoring, transmit signal proportional to pH
Type:	Triple junction gel-filled reference electrode, retractable insertion type sensor, integrated LCD display
Input Signal:	Analog process level
Range:	0 to 14 pH
Temperature Input:	RTD, 5 to 248 degrees F
Output Signals:	
Analog:	Two, independently isolated 4-20 mA, 600 ohm max load resistance, proportional to process pH and temperature
Relays:	Four form C SPDT, 5A @ 30 VDC, relay contacts configurable for indication of sensor/RTD/analyzer fault, setpoint pH and temperature alarms
Display:	Integral indicator for pH, temperature, glass impedance, sensor and diagnostic conditions
Accuracy:	+/- 0.01 pH
Repeatability:	+/- 0.01 pH
Stability:	+/- 0.01 pH/month, non-cumulative
Temperature Compensation:	Selectable for automatic or manual
Operating Limits:	100 psig at 212 degrees F
Ambient Temperature:	32 to 122 degrees F
Materials:	
Sensor Body:	Tefzel
RTD Housing:	Titanium Tube
Enclosure:	NEMA 4X
Power Supply:	120 VAC
Mounting:	Pipe Mounting: Stainless steel ball valve kit for insertion type sensor, installed to be retractable, allowing safe removal under pressure without process shutdown. Tank Mounting: Submersion type with integral cable and sensor.
Accessories:	Two buffering solutions, retractable ball valve kit
Manufacturer:	Rosemount, Johnson Yokogawa Corporation, or equal
Model:	Model 56 transmitter with Model 385+ sensor

B. Chlorine Residual Analyzer ((AE)/(AIT))

Function:	Continuous free residual chlorine monitoring, transmit signal proportional to chlorine residual
Type:	Free and total residual analysis, microprocessor based control unit using DPD colorimetric method, integrated LCD display
Performance Criteria:	Standard Methods 408.E
Range:	0 to 5 mg/l free or total chlorine residual
Outputs:	4-20 mA programmable over span, 130V isolation from earth ground,
	Two SPDT, 5A @ 230 VAC, relay contacts configurable for sample concentration alarm, system warning, and system shutdown alarms
Display:	Integral LCD indicator and alarm status LED
Resolution:	0.035 mg/l
Accuracy:	+/- 5% or 0.035 mg/l, whichever is greater
Repeatability:	Within 0.05 mg/l
Cycle Time:	One sample analysis every 2-1/2 minutes
Sample Flowrate:	Minimum 200 ml/min
Sample Inlet Pressure:	1.5 to 75 psig
Ambient Temperature:	41 to 104 degrees F
Power Requirements:	120 VAC, 90 VA max
Enclosure:	NEMA 12
Installation:	Sample supply line shall be provided with hot tap in process piping. Tap location and drain line routing shall be approved by Owner/Engineer.
Accessories:	Sample supply line including ball valve and pressure regulators (adjustable and preset), drain line, maintenance kit, Y-strainer, and (3) reagent kits for each analyzer
Manufacturer:	Hach Company, or equal
Model:	CL17sc

2.13 ACCESSORIES

A. All piping and tubing for connections to instruments shall be stainless steel. Threaded pipe shall be ASTM A312, Grade TP304, Schedule 40S, and fittings shall be AISI Type 304. Tubing shall be ASTM Grade TP304, 0.028-inch minimum wall thickness for flareless “bite” type with threaded nut and ferrule fittings.

B. Valves shall be stainless steel eccentric plug valves with a bolted-on non-removable lever actuator. Valves shall be equal to DeZuric Figure 130 with synthetic rubber faced plugs. Valves shall have screwed or flanged ends as required. Valves for gas service shall be designed for gas service and shall provide leak-proof shutoff.

C. Diaphragm seals shall provide continuous isolation between pressure gauges, switches, and transmitters from process fluid. Upon instrument removal or failure, there shall be no leakage. Seals shall be of the type to allow instrument and diaphragm top housing to be removed from the process piping with no leakage of process fluid. Seal fill fluid shall

be incompressible, non-corrosive, and suitable for materials of construction and temperature encountered, and shall be selected to minimize temperature effect. Sludge piping process connections shall be 1-1/2-inch, 150 pound flanged. Gas and water piping process connections shall be 3/4-inch NPT. All instrument piping connections shall be 1/2-inch or 1/4-inch NPT, as required. All process connections shall have a 1/4-inch NPT flushing connection with a 316 SS plug.

D. All mechanical fasteners such as bolts, nuts, screws, cinch anchors, clamps, etc., shall be stainless steel.

E. All special mounting brackets shall be stainless steel, galvanized, or nonferrous non-corrosive metal.

F. All equipment mounted outdoors that includes any type of visual indicator, LCD, etc., shall be furnished with a sun visor.

G. All equipment located outdoors shall include a thermostatically controlled space heater.

H. All field instruments and devices shall be equipped with a 1-inch x 3-inch stainless steel identification tag firmly affixed to the instrument or device with stainless steel fasteners. Each tag shall show the manufacturer's name, serial number, part number, tag number (to be approved by the Engineer), calibrated ranges, or calibration constants.

I. For each type of device installed, the Contractor shall supply two complete sets of software, hardware, calibration devices, and cabling, used to configure, calibrate, or make adjustments.

PART 3 EXECUTION

3.01 GENERAL

A. The features and installation of the instrumentation shall be coordinated for optimal performance with the characteristics of the process material to be metered.

B. Care must be exercised to identify locations that meet the requirements of the manufacturer including upstream and downstream distances, pressures, temperatures, and accessibility for maintenance.

C. Verify equipment requirements and dimensions with provisions specified under this Section. Check actual field conditions, report necessary changes, and submit equipment reflecting changes.

D. Coordinate Work with other trades to avoid conflict and to provide correct rough-in and electrical connection requirements. Inform Contractors of other trades of the required access to and clearances around equipment to maintain serviceability and code compliance.

E. Where the installation of any device is dependent on, or affected by, Work performed under other sections of these specifications, the Contractor shall coordinate the Work. Installation coordination includes the correct location and placement of devices, piping

to the equipment, pipe taps, control power circuits, connections to the control system, etc.

F. Installation of instrumentation in an existing system being modified, replaced, or abandoned, shall be coordinated with the Owner and shall be performed to minimize operational disruptions and minimize time that equipment may be out of service.

3.02 INSTALLATION

A. Installation shall include the provision of materials, and the coordination of all details, necessary to properly install the instruments including location, arrangement in piping, power source, signal wiring and conduit, special brackets, and all mounting hardware.

B. All instrumentation devices shall be installed in accordance with the manufacturer's installation requirements.

C. Wiring practices for intrinsically safe systems shall be in accordance with ISA RP12.06.01.

D. Instruments shall be installed so that the various components are accessible for maintenance. Care shall be taken in the installation to ensure sufficient space is provided between instruments and other equipment, including piping, for ease of removal and servicing. All instruments shall be readily accessible from grade, permanent platforms, or fixed ladders.

3.03 STARTUP AND TRAINING

A. The Contractor shall provide the services of component manufacturer's factory trained personnel for the supervision of installation, initialization, and calibration of equipment.

1. These services shall also include a minimum of one eight-hour day to instruct the Owner's personnel in the operation and maintenance of the equipment. Specifically, these services shall be provided for but not limited to the following equipment items: All new equipment that is provided by Contractor.

Specification Subsection	Description
2.07 B	Radar Level Sensor
2.08 A	Magnetic Flow Meter

PART 4 SPECIAL PROVISIONS

4.01 GENERAL

A. Schedules included herein are intended to supplement the Drawings and are not guaranteed to be complete. All instrumentation devices shown in the Contract Documents or otherwise required to complete the Work shall be furnished and installed.

4.02 LEVEL INSTRUMENT SCHEDULE

A. The following schedule is a listing of level instruments to be installed including: radar and sonic transducers, capacitance probes, and floats.

B. The following letter designations are used in the schedule:

Item Designation:

LT-1	First Letter	L	=	Indicates Level Device
	Second Letter	T	=	Function, Indicator and Transmitter
	Number	1	=	Item Number

Function:

S	Switch
I	Indicator
T	Transmitter

Range: As noted

C. Level instruments are numbered on the Drawings and scheduled as follows:

Item Designation.	Process Function	Estimated Range*	Process Conditions	Power Supply	NEMA Rating	Dwg No.	Spec No.
LSH-03	Waste Sump 1 High Level	n/a	Water	24 VDC	4X	I-0.4	2.07 A
LSH-04	Waste Sump 2 High Level	n/a	Water	24 VDC	4X	I-0.6	2.07 A
LE/LIT-03	Clearwell 1 Level	0 – 25 ft	Water	12 VDC	4X	I-0.7	2.07 C
LE/LIT-04	Clearwell 2 Level	0 – 25 ft	Water	12 VDC	4X	I-0.7	2.07 C
LE/LIT-05	Sodium Hypochlorite Bulk Storage Tank 1 Level	0 – 8 ft	Sodium Hypochlorite	120 VAC	4X	I-0.9	2.07 B
LE/LIT-06	Sodium Hypochlorite Bulk Storage Tank 2 Level	0 – 8 ft	Sodium Hypochlorite	120 VAC	4X	I-0.9	2.07 B
LE/LIT-07	Caustic Soda Bulk Storage Tank 1 Level	0 – 8ft	Caustic Soda	120 VAC	4X	I-0.9	2.07 B
LE/LIT-08	Caustic Soda Bulk Storage Tank 2 Level	0 – 8ft	Caustic Soda	120 VAC	4X	I-0.9	2.07 B
LE/LIT-09	Sodium Hypochlorite Bulk Storage Tank 1 Leak/Spill Alarm	n/a	Sodium Hypochlorite	120 VAC	4X	I-0.9	2.07 D
LE/LIT-10	Sodium Hypochlorite Bulk Storage Tank 2 Leak/Spill Alarm	n/a	Sodium Hypochlorite	120 VAC	4X	I-0.9	2.07 D
LE/LIT-12	Caustic Soda Bulk Storage Tank 1 Leak/Spill Alarm	n/a	Caustic Soda	120 VAC	4X	I-0.10	2.07 D

LE/LIT-13	Caustic Soda Bulk Storage Tank 2 Leak/Spill Alarm	n/a	Caustic Soda	120 VAC	4X	I-0.10	2.07 D

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4.03 FLOW INSTRUMENT SCHEDULE

A. The following schedule is a listing of new flow devices to be installed.

B. The following letter designations are used in the schedule:

Item Designation:

FT-1	First Letter	F	=	Indicates Flow Device
	Second Letter	T	=	Function, Transmitter
	Number	1	=	Item Number

Function:

S	Switch
I	Indicator
T	Transmitter

C. Flow devices are numbered on the Drawings and scheduled as follows:

Item Designation	Function	Pipe Size	Estimated Range gpm*	Process psig*	Process Conditions	Power Supply	NEMA Rating	Dwg No.	Spec No.
FE/FIT-01	Raw Water Flow	12”	100 - 1800	15	Water	120 VAC	4X	I-0.3	2.08 A
FE/FIT-02	Dualator 1 Flow	8”	100 - 500	10	Water	120 VAC	4X	I-0.3	2.08 A
FE/FIT-03	Dualator 2 Flow	8”	100 - 500	10	Water	120 VAC	4X	I-0.3	2.08 A
FE/FIT-04	Filtered Water Flow	12”	100 -1800	30	Water	120 VAC	4X	I-0.5	2.08 A
FE/FIT-05	Blended Waters Flow	6”	50 - 600	20	Water	120 VAC	4X	I-0.6	2.08 A
FE/FIT-06	Softener 1 Flow	6”	50 - 400	20	Water	120 VAC	4X	I-0.6	2.08 A
FE/FIT-07	Softener 2 Flow	6”	50 - 400	20	Water	120 VAC	4X	I-0.6	2.08 A
FE/FIT-08	Softener 3 Flow	6”	50 - 400	20	Water	120 VAC	4X	I-0.6	2.08 A
FE/FIT-09	High Service Pumps Flow	12”	200 - 1800	75	Water	120 VAC	4X	I-0.8	2.08 A
FE/FIT-10	Plant Flow	6”	25 - 300	75	Water	120 VAC	4X	I-0.8	2.08 A
*Values to verified during shop drawing review.									

4.04 RESERVED

4.05 RESERVED

4.06 ANALYTICAL INSTRUMENT SCHEDULE

A. The following schedule is a listing of analytical devices including: gas detection, chlorine residual monitors, turbidity, etc.

B. The following letter designations are used in the schedule:

Item Designation:

AIT-1	First Letter	A	=	Indicates Analytical Device
	Second Letter	I	=	Function, Indicator
	Third Letter	T	=	Function, Transmitter
	Number	1	=	Item Number

Function:

C	Controller
S	Switch
I	Indicator
T	Transmitter

C. Analytical instruments are numbered on the Drawings and scheduled as follows:

Item No.	Function	Range	Power Supply	NEMA Rating	Dwg No	Spec No.
AE/AIT-01	Filter 1 Chlorine Effluent	0 to 5 mg/l	120 VAC	12	I-0.4	2.12 B
AE/AIT-02	Filter 2 Chlorine Effluent	0 to 5 mg/l	120 VAC	12	I-0.4	2.12 B
AE/AIT-03	Blended Water pH	0 to 14 pH	120 VAC	4X	I-0.8	2.12 A
AE/AIT-04	Residual Chlorine	0 to 5 mg/l	120 VAC	12	I-0.8	2.12 B

4.07 SPARE PARTS

A. The Contractor shall furnish spare parts as shown in the Spare Parts Schedule. The spare parts shall be individually packaged for protection against dirt and moisture. Each package shall be labeled as to its contents with a description and part number.

B. All spare parts shall become the property of the Owner. The Contractor shall maintain the spare parts inventory level as shown in the Spare Parts Schedule, and replace at no cost to the Owner all spare parts consumed during the one-year warranty period.

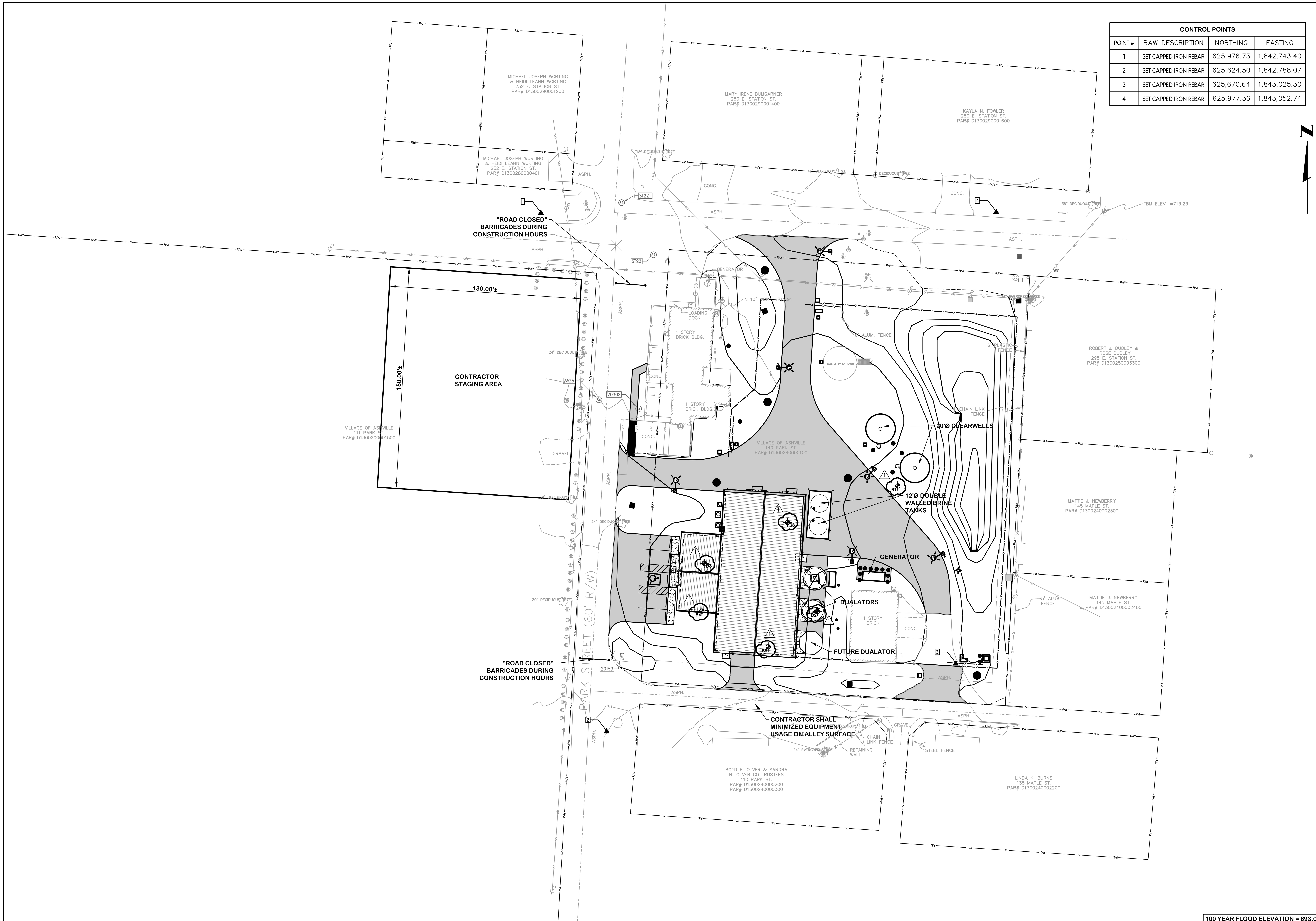
4.08 SPARE PARTS SCHEDULE

A. Specification

Subsection Number	Description	Quantity	Remarks

B. Where a unit is indicated it shall be a complete unit as specified herein and installed including enclosure.

END OF SECTION


"ROAD CLOSED" BARRICADES DURING CONSTRUCTION HOURS
CONTRACTOR STAGING AREA
130.00'±
150.00'±
VILLAGE OF ASHVILLE 111 PARK ST. PAR# D1300200001500
MICHAEL JOSEPH WORTING & HEIDI LEANN WORTING 232 E. STATION ST. PAR# D1300290001200
MICHAEL JOSEPH WORTING & HEIDI LEANN WORTING 232 E. STATION ST. PAR# D1300280000401
MARY IRENE BUMGARNER 250 E. STATION ST. PAR# D1300290001400
KAYLA N. FOWLER 280 E. STATION ST. PAR# D1300290001600
TBM ELEV. =713.23
ROBERT J. DUDLEY & ROSE DUDLEY 295 E. STATION ST. PAR# D1300250003300
VILLAGE OF ASHVILLE 140 PARK ST. PAR# D1300240000100
20'Ø CLEARWELLS
12'Ø DOUBLE WALLED BRINE TANKS
GENERATOR
DUALATORS
FUTURE DUALATOR
MATTIE J. NEWBERRY 145 MAPLE ST. PAR# D1300240002300
MATTIE J. NEWBERRY 145 MAPLE ST. PAR# D1300240002400
1 STORY BRICK BLDG.
1 STORY BRICK
LOADING DOCK
PARK STREET (60' R/W)
"ROAD CLOSED" BARRICADES DURING CONSTRUCTION HOURS
CONTRACTOR SHALL MINIMIZED EQUIPMENT USAGE ON ALLEY SURFACE
BOYD E. OLVER & SANDRA N. OLVER CO TRUSTEES 110 PARK ST. PAR# D1300240000200 PAR# D1300240000300
LINDA K. BURNS 135 MAPLE ST. PAR# D1300240002200
N

CONTROL POINTS			
POINT #	RAW DESCRIPTION	NORTHING	EASTING
1	SET CAPPED IRON REBAR	625,976.73	1,842,743.40
2	SET CAPPED IRON REBAR	625,624.50	1,842,788.07
3	SET CAPPED IRON REBAR	625,670.64	1,843,025.30
4	SET CAPPED IRON REBAR	625,977.36	1,843,052.74

100 YEAR FLOOD ELEVATION = 693.0

OVERALL CIVIL SITE PLAN

VILLAGE OF ASHVILLE, OHIO
NEW WATER TREATMENT PLANT

NO	DATE	BY	REVISIONS AFTER ISSUED FOR BID
1	12/17/25	JDM	ADDED BORINGS

Jones & Henry Engineers, Ltd.
Fluid thinking®.
www.JHeng.com

JOB NO. 1000-8177.002
SCALE 1"=30'
THIS LINE SCALES 1" WHEN PLOTTED TO NOTED SCALE

DESIGNED	DRAWN	CHECKED
JDM	BJD	JDM

STATUS: ISSUED FOR BID
DATE: 11/18/25
SHEET NO.
C-1.0
12 of 129

CIN-8177002C2-12 C-1.0 OVERALL SITE PLAN
11/11/2025 12:41 PM - BDRILL
12/17/2025 12:32 PM