

1. PAINTING WORK

1.1 Description. This work consists of furnishing all labor, materials, tools and equipment required for the cleaning, surface preparation, field painting, and disinfection of the 1,000,000 gallon ground level water storage tank. Full exterior containment will be required on the tank in accordance with all governing rules and regulations and industry standards. All painting work shall be in accordance with AWWA D102 "AWWA Standard for Painting Steel Water Storage Tanks," latest revision. Materials in contact with potable water shall be in accordance with NSF 61.

1.2 Specifications. This item shall be performed in accordance with the applicable specifications of the following organizations:

SSPC: The Society of Protective Coatings
NACE: National Association of Corrosion Engineers
ASTM: American Society for Testing and Materials
OSHA: Occupational Safety and Health Administration
AWWA: American Water Works Association
NSF: National Sanitary Foundation

1.3 Site Location, Access, and Use. The site location and contractor access to and use of the site shall be as described in this section and as shown on the Site Access and Use plan.

The contractor shall keep all work, materials, and equipment required for this contract in the area identified on the Site Access and Use Plan, unless temporary work agreements are obtained from the neighboring property owners. A copy of any such work agreement shall be forwarded to the Engineer.

1.4 Contractor and Manufacturer Qualifications. All contractors bidding this project shall provide documentation with their bid of having repainted five (5) tanks of similar or greater size and complexity. Contractor shall submit a list of references that include the project name and location, owner's name, engineer's name, paint manufacturer's name, approximate area of paint applied, and date of completion. Contractors shall be experienced in the application of the specified or similar paints for a minimum of 5 years on projects of similar size and complexity. The contractor shall employ persons trained for application of the specified paint system. The contractor shall be certified by the paint manufacturer as an approved applicator of the specified paint system.

The paint manufacturer shall specialize in the manufacturing of paint and have a minimum of 10 years' experience and have a history of successful performance on comparable projects. The paints shall be the products of a single manufacturer. This specification is based on paint systems from The Sherwin-Williams Company. Similar paint systems from an alternative manufacturer may be approved as an equal, provided that the manufacturer's alternate systems meet the requirements of this specification and that the paint systems are equal in composition, application and curing conditions, and anticipated performance.

Requests for alternate manufacturers shall include manufacturer's literature for each product giving the name, generic type, descriptive information, and solids by volume, recommended dry film thickness and a list of five similar projects where each product has been used and rendered satisfactory service. No request shall be considered that would decrease film thickness or offer a change in the generic type of paint specified. Manufacturer's certified test reports showing that the product(s) equal or exceed the performance of the specified products shall be submitted.

1.5 Submittals. Prior to the start of any work, the contractor shall furnish to the Engineer the following submittals:

Product Data- Manufacturer's product data for each paint, including generic description, complete technical data, surface preparation, and application instructions.

Color Samples- Manufacturer's color samples showing full range of standard colors. Engineer will select the exterior finish coat color.

Manufacturer's Quality Assurance- Manufacturer's certification that paints comply with specified requirements and are suitable for intended application.

1.6 Surface Preparation. Surfaces shall be clean, dry, and adequately protected from dampness. Surfaces shall be smooth, even, and true to plane. Surfaces shall be free of any material that would adversely affect adhesion or appearance of painting and coating. Cleanliness shall be checked by wiping the prepared steel surface with a white cloth dampened with manufacturer's thinner for the particular paint system. If a dark spot appears on the rag from light wiping, the contractor shall take steps to clean the surface more thoroughly before applying paint. Surface preparation for each tank shall be performed as dictated in the section entitled "Surface Preparation and Paint System Schedule." Surface preparation shall follow the requirements of the SSPC specification stated in the Schedule and as additionally described in this section.

Abrasive blast-cleaned surfaces shall be coated with primer before visible rust forms on the surface. Blast-cleaned surfaces shall not be uncoated for more than 8 hours. If any rustback occurs, then the surfaces shall be abrasive blasted again so that the surface preparation meets or exceeds the blast standard stated in the Schedule.

1.7 Paint Systems. The following paint systems shall be used as dictated in the section entitled "Surface Preparation and Paint System Schedule":

Tank Exterior Paint System- The following exterior paint system shall be used on the tank exterior, in accordance with AWWA D102 Outside Coating System No. 6 (OCS-6):

Primer Coat: Corothane I GalvaPac 1K Zinc Primer (3 mils DFT)

Intermediate Coat: Macropoxy 646 Fast Cure Epoxy Mastic (5 mils DFT)

Finish Coat: two (2) coats of Hi-Solids Polyurethane 250 Aliphatic Polyurethane (Gloss) (4 mils DFT each)

Tank Wet Interior Paint System- The following interior paint system shall be used on the tank wet interior, in accordance with AWWA D102 Inside Coating System No. 5 (ICS-5):

Primer Coat: Corothane I GalvaPac 1K Zinc Primer (2.5 mils DFT)

Stripe Coat: Macropoxy 5500LT Potable Water Epoxy (4 mils DFT)

Intermediate Coat: Macropoxy 5500LT Potable Water Epoxy (4 mils DFT)

Finish Coat: Macropoxy 5500LT Potable Water Epoxy (4 mils DFT)

1.8 Paint Delivery, Storage, and Handling. All paint shall be delivered to and stored at the site and handled in accordance with the manufacturer's requirements and as described in this section.

Paint shall be delivered to the site in manufacturer's original, unopened containers and packaging, with labels clearly indicating material name, manufacturer, color name and number, batch or lot number, date of manufacture, mixing and thinning instructions.

Paint shall be stored in a clean, dry area and within the temperature range recommended by the manufacturer. Containers shall remain sealed until ready for use, and the paint shall not be used beyond the manufacturer's shelf life limits. Paint shall be protected during handling and application to prevent damage or contamination.

1.9 Environmental Conditions. All paint shall be applied in conditions that are in accordance with the manufacturer's recommendations and as follows:

No painting shall be done under conditions that are unsuitable for the production of good results. Paint shall be applied within the manufacturer's recommendations for air and surface temperatures. The surface temperature shall be a minimum of 5°F above dew point. Do not apply exterior paint when temperature is below 50°F or above 90°F. Surfaces shall be prepared and paint applied within relative humidity range recommended by the manufacturer. Surfaces shall not be prepared nor paint applied in rain, snow, fog, mist, or direct sunlight. Painting work shall be scheduled to avoid excessive dust and airborne contaminants during both application and curing.

1.10 Paint Application. Paint shall be applied in accordance with AWWA and NSF standards, the manufacturer's recommendations, and as described in this section.

Any thinning required shall be done in a manner and exclusively with the type of reducer recommended and in accordance with the manufacturer's recommendations.

All materials shall be applied under adequate illumination.

Materials shall be thoroughly mixed and kept at a uniform consistency during application. Observe the pot life limitations. Temperature shall be monitored to assure proper viscosity during application.

Where multiple coats of paint are used, each coat of paint shall be slightly different shade than the preceding coat.

Finished work shall be uniform and of the approved color. It shall completely cover, be smooth and free of runs, sags, wrinkles, shiners, streaks, and brush marks. The edges of paint adjoining other materials or colors shall be sharp and clean without overlapping.

Uniformly apply paint at spreading rate required to achieve specified dry film thickness. Total minimum dry film thickness of paint films specified herein will be measured with an Elcometer or similar instrument to determine acceptability.

Where specified, stripe paint with brush critical locations on steel such as welds, corners, and edges using the specified stripe coat.

1.11 Surface Preparation and Paint System Schedule. The types of surface preparation and painting to be used on each tank being painted shall be in accordance with the following schedule:

Steel Exterior		
Surface Preparation		Commercial Blast Cleaning (SSPC SP-6)
Description	Paint Specification	Minimum DFT
Prime Coat	Corothane I Galvapak 1K Zinc Primer	3.0 mils
Intermediate Coat	Macropoxy 646 Fast Cure Epoxy Mastic	5.0 mils
Finish Coat (2 Coats)	Hi-Solids Polyurethane 250 Aliphatic Polyurethane (Gloss)	4.0 mils
Steel Wet Interior		
Surface Preparation		Near White Metal Blast (SSPC SP-10)
Description	Paint Specification	Minimum DFT
Primer Coat	Corothane I Galvapak 1K Zinc Primer	2.5 mils
Stripe Coat	Macropoxy 5500LT Potable Water Epoxy	4.0 mils
Intermediate Coat	Macropoxy 5500LT Potable Water Epoxy	4.0 mils
Finish Coat	Macropoxy 5500LT Potable Water Epoxy	4.0 mils

1.12 Inspection. The Owner reserves the right to have independent third party inspection of the surface preparation and painting application. Every effort will be made to limit the down time of the contractor during the course of the project. Special attention will be given to the specified surface preparation, number of coats, dry film thickness, ambient temperature, and weather conditions.

The contractor shall be responsible for additional inspection costs that are the result of the contractor's actions (re-inspection of deficient work, not providing safe conditions for performing inspections, etc.).

1.13 Touch-up and Repair. At completion, all painted surfaces will be inspected. All damaged spots, whether due to defective materials or workmanship or defects of surfaces covered shall be touched up and the finish restored. Additional coats of paint required to cover all spots or discoloration of every sort shall be applied at no additional cost to the Owner.

1.14 Caulking. Upon completion of painting work and allowing proper curing time, the Contractor shall apply a non-sag elastomeric sealant to all stitch-welded joints on the roof plates, weld seams, roof lap joints, and penetrations. The sealant shall be Sikaflex-1a or approved equal.

1.15 Disinfection. Upon completion of painting and caulking work, the Contractor shall disinfect the tank in accordance with AWWA C652, Method 2, and as follows:

The Contractor shall not disinfect water contact surfaces or fill water storage tanks until application of paint systems is complete, paint has fully cured, and field quality control inspection is complete, but not less than seven (7) days after application.

The Contractor shall allow the appropriate number of days in accordance with the manufacturer's instructions and as directed by Engineer for full cure of paint systems on water contact surfaces before flushing, disinfecting, or filling with water.

Water for disinfection purposes will be provided by the Owner at no charge to the Contractor for performance of one disinfection procedure. If the tank requires disinfection more than one time, the contractor shall pay for the water at the current water rate for all additional disinfection procedures. Water will be available at the water tank site.

All interior surfaces shall be thoroughly rinsed with clean water to remove loose paint, dirt and debris. After rinsing, the disinfection shall be performed in accordance with Chlorination Method 2 for welded steel storage tanks as described in AWWA C652, latest edition.

A solution of 200 parts per million of available chlorine shall be applied by spraying to thoroughly coat all surfaces of the water tank which would be in contact with water when tank is full to the overflow elevation. The surfaces disinfected shall remain in

contact with the chlorine solution for at least 30 minutes, after which potable water shall be admitted to fill the tank to overflow.

Samples of the potable water from the tank shall be collected and tested for bacteriological quality and shall show the absence of coliform organisms. Samples will be collected and tested by City of Wooster Water Treatment Plant personnel. If the initial disinfection fails to produce coliform free samples, the disinfection procedure shall be repeated until satisfactory samples are obtained. After satisfactory samples are obtained, the tank may be placed in service.

Personnel working inside the tank during sterilization shall be equipped with suitable air masks and safety lines leading through a manhole to personnel outside the tank. All safety precautions shall be observed.

1.16 One-Year Inspection. The Owner will set a date for a one-year inspection of paint systems. The inspection shall be attended by the Owner, Contractor, Engineer, and manufacturer's representative. Any deficiencies noted in the paint systems as determined by the Engineer shall be repaired in accordance with the manufacturer's recommendations.

1.17 Workmanship and Cleanup. The contractor shall keep the premises clean at all times and shall remove all rubbish as often as directed by the Engineer. All debris is to be removed from the grounds and shall be properly disposed of in accordance with all local, state, and federal rules and regulations. The contractor shall remove all temporary brackets, hooks, cabling, and other connectors that were used for containment or other uses during performance of this work.

1.18 Payment. Payment under this item shall be at the contract lump sum price bid for the various items under Painting Work, which payment shall constitute full compensation for furnishing all labor, materials, tools and equipment required to complete this item as specified herein.

2. TANK REPAIR WORK

2.1 Description. This item shall include all labor, materials, and equipment required for the modification, repair, and/or replacement of the tank and/or tank components as shown on the drawings or specified herein.

2.2 Specifications. Work performed under this item shall be in accordance with the most recent revisions of the American Water Works Association D100: Standard for Welded Carbon Steel Tanks for Water Storage (latest revision), NSF 61, and all applicable OSHA regulations.

2.3 Materials. The following components shall be furnished and installed by the Contractor as shown on the drawings or specified herein:

Vent – The roof vent shall be an aluminum pressure-vacuum vent, sized handle the pressure differential caused by water entering or exiting the tank at the maximum rate. The vent shall have a minimum diameter of 24 inches, or as otherwise required to accommodate maximum inlet and outlet rates of 4,200 gallons per minute. The contractor shall be required to verify that the vent furnished matches the opening and bolt pattern of the existing roof hatch. If applicable, the contractor shall be required to install a new cap plate with a nozzle for a 24" vent. The open area of the overflow shall not be considered as a venting area. The vent shall be screened with non-corrodible 16 mesh insect screen and shall be designed with a fail-safe system to relieve any pressure or vacuum in the event the screen frosts over or is otherwise clogged. Vent shall be easily dismantled for cleaning and shall be self-correcting. The pressure-vacuum vent shall be mounted on the vent. The vent shall be the Always Safe Tank Vent as manufactured by Advance Tank and Construction Company or approved equal.

Overflow Flap Valve – The flap valve shall be a curved bill valve that is installed by sliding over the pipe and is held in place with clamps. The valve shall open using line pressure and not require an outside energy source to open. The valve shall be designed so that it will not freeze shut. The valve shall be fabricated from 100% elastomer material (eg. Neoprene, Hypalon, Buna-N, EPDM, and/or Viton). The clamps shall be series 304 or 316 stainless steel. The valve shall be Series TF-2 Duckbill Check Valve as manufactured by Tideflex Technologies or approved equal.

Railing – The handrail, midrail, and posts shall be constructed of 2-1/2" x 2-1/2" x 1/4" structural steel angle. The post base plates shall be 6" x 6" x 1/4" plate steel. All welds shall be 3/16" continuous fillet welds. The railing shall be fabricated, blasted, and primed in the shop. See Railing Detail sheet.

Shell Manhole – One shell manhole shall be furnished and installed opposite the existing 24 inch manhole. The manhole shall be 30 inches in diameter. Should the shell manhole weigh more than 50 pounds, it shall be provided with a hinge or davit.

2.4 Installation. All materials shall be installed in accordance with the manufacturer's recommendations, and the contractor shall be responsible for making any modifications necessary to the tanks in order to install the materials in accordance with the manufacturer's recommendations.

Prior to installation of the overflow flap valve, the overflow pipes shall be cut such that sufficient length beyond the bend remains for proper connection of the flap valve and that when installed,

the flap valve will be an appropriate height above the ground. The existing mesh screen over the end of overflow pipe shall be removed prior to installation of the overflow flap valve.

2.5 Welding. Shop fabrication and field welding shall conform to all American Welding Society and American Water Works Association requirements. The contractor shall ensure that welders or welding operators are qualified in accordance with ASME Section IX or ANSI/AWS B2.1.

2.6 Coordination with Painting Work. Unless otherwise approved by the Engineer, the sidewall railing and modification to the overflow pipe length shall be performed prior to the painting work, such that these components receive the same coating as the rest of the tank. The installation of the vent and overflow flap valve shall be done following the painting work.

2.7 Removal and Disposal. Contractor shall be responsible for removal of any items designated for removal. Except for any items that are specifically designated on the drawings to be salvaged for the Owner, all existing components that are removed shall become possession of the Contractor and the Contractor shall be responsible for disposal in accordance with all applicable regulations.

2.8 Payment. Payment under this item shall be at the contract lump sum price bid for the various items under Tank Repair Work, which payment shall constitute full compensation for furnishing all labor, materials, tools, and equipment required to complete this item as shown on the drawings and specified herein.

3. CATHODIC PROTECTION

3.1 Description. Under this item the contractor shall furnish all labor, materials, tools and equipment required to complete all cathodic protection as shown on the drawings or specified herein.

3.2 General. This item shall generally include the furnishing and installation of cathodic protection for the 1,000,000 gallon ground-level water storage tank. The cathodic protection contractor shall provide all engineering services, materials, equipment, labor, and supervision for the installation of an automatically controlled impressed current cathodic protection system to provide corrosion control for the interior submerged surface of the specified tank. All work furnished shall be in accordance with AWWA Standard D104, ANSI/NSF 61 and features included in this specification. All miscellaneous or incidental items required for complete cathodic protection installation shall be furnished and installed even though not itemized herein.

3.3 Design. All engineering services shall be provided by a Corrosion Specialist who is accredited by the National Association of Corrosion Engineers International as a Senior Corrosion Technologist, Corrosion Specialist or Cathodic Protection Specialist. The system shall be designed by a Corrosion Specialist with experience in cathodic protection for water storage tanks. The Corrosion Specialist shall design the system to provide effective corrosion control in accordance with criteria for protection. The criteria for protection shall be based on a tank-to-water potential, IR drop free, within a range of -0.850 volts to -1.050 volts relative to a stationary copper-copper sulfate reference electrode. This potential shall be measured free of the effect of voltage gradients (IR drop).

The Corrosion Specialist shall also base system capacity and performance on:

1. Total submerged surface area of the tank. (*includes area up to high water line within tank bowl and wet risers in elevated tanks which are 30" in diameter or larger*)
2. Type of coating and condition of coating.
3. Total bare surface area to be protected will be a minimum of 25% of total surface area.
4. Minimum current density of 0.5 MA/ft² bare surface area.
5. Chemical analysis of water including resistivity expressed in ohm-cm.
6. Susceptibility of tank to icing conditions.
7. Minimum anode design life of twenty (20) years.
8. Selection, dimensions, and layout of system components specified in Section 3.4 of this specification.

3.4 System Components and Materials. All components and materials in contact with the water or exposed to the interior of the tank shall be classified in accordance with ANSI/NSF 61 "Drinking Water System Components". Components and materials to be utilized for the performance of work under this item shall be of the best quality regularly used in commercial practice and shall be as follows:

Rectifier Unit - A conventional rectifier unit shall be housed in a weatherproof cabinet with provisions for locking. The rectifier shall perform in accordance with ANSI/AWWA Standard D104 and shall be equipped with the following:

1. Transformer
2. Silicon rectifying elements
3. Circuit breaker(s)

4. Lightning, surge, and overload protection
5. Provision for air-cooling operation
6. Digital voltmeter(s), ammeter(s) and potential meter(s)
7. Stainless steel weatherproof cabinet in accordance with NEMA 4 requirements
8. Provision to vary current output from 0% to 100% of rated capacity
9. Provisions for mounting, grounding, and locking
10. Provision for 110-120 volt, 60 Hz, single phase A.C. power.
11. D.C. output capacity in volts and amperes in accordance with Section 3.3 of this specification
12. Number of circuits in accordance with Section 3.3 of this specification

The installed rectifier unit shall be designed for and demonstrated capable of continually providing a minimum direct current output of 8 amperes at a maximum of 30 volts.

Automatic Controller - The automatic controller shall be of completely solid state design having no moving parts and shall be capable of automatically maintaining the tank-to-water potential and compensate for changes in water level, temperature of water, water chemistry, and cathodic polarization, and shall include the following provisions:

1. Utilize long-life reference electrode(s) installed within the tank
2. Monitor the tank-to-water potential, free of IR drop
3. Automatically adjust the tank-to-water potential, free of IR drop, to a preset value
4. Operate within 25MV of preset value
5. Limit current to a preset value
6. Utilize digital potential meter(s) to display tank-to-water potential, free of IR drop

Tank-to-Water Potential Meter - The automatic controller shall be equipped with a calibrated voltmeter having an internal impedance exceeding 1,000 megohms which shall be so connected to read, from the reference electrode, the tank-to-water potential being maintained by the cathodic protection. This voltage reading shall be free of "IR" drop error.

Reference Electrode - The permanent reference electrode shall consist of a copper-copper sulfate electrode which is manufactured to remain stable (plus or minus 10MV) for minimum of ten (10) years. The reference electrode to lead wire connection shall be encapsulated to prevent water migration. The stationary reference electrode shall be positioned within the tank to provide the most representative measurements for the submerged surface area(s).

Conductors - All conductors shall have type "TW" insulation and shall be sized in accordance with the National Electric Code, current edition. All wiring installed underground shall have High Molecular Weight insulation for direct burial use. The ground connection of the negative lead shall be made at an accessible point on the tank structure.

Conduit - All conduit shall be of rigid aluminum type. All wiring installed exterior of the tank bowl itself shall be installed in conduit.

Hardware - All hardware used in conjunction with the system shall be protected against corrosion.

Anodes - A permanent anode system shall be furnished to provide a minimum design maintenance-free anode life of 10 years. This permanent system shall consist of the following:

1. An anode suspension system shall be designed to be resistant to ice damage and in

accordance with AWWA Standard D104, Section 4.2.4.1.1 Type A, Horizontal System. The anode suspension system shall consist of a minimum 5/16" polyester cord. The cord shall be secured to steel anchors welded to the side wall and/or floor of the tank bowl or to the exterior of the dry access column of spheroidal type tanks. Tanks with wet risers which are 30" diameter or larger shall incorporate an anode suspension system with the steel anchors welded to the sidewall of the riser pipe. All cord to cord connections shall be tied and taped.

2. The anode materials shall be selected in accordance with Section 3.3 and shall consist of one of the following:
 - a. Minimum .062" diameter titanium with a mixed metal oxide coating.
 - b. Minimum .062" diameter platinized niobium with 25 micro-inches of platinum.*All anode to header cable connections shall be sealed to prevent water migration.*
3. Pressure entrance fittings shall be provided that will accommodate anode and reference electrode lead wires at the base of the tank or at the base of wet risers for elevated tanks that are 30" diameter or larger. The fitting shall be manufactured to prevent leakage through the fitting and to prevent water migration through the wire insulation. The entrance fitting shall be sized for minimum of 1.0 inch NPT, 3000 psi steel coupling.

3.5 Submittals. The cathodic protection constructor shall submit the following information to the purchaser for approval by the Owner or his representative.

1. Drawings showing system design/configuration.
2. Description of system components.
3. Copy of ANSI/NSF 61 classification for all system components located within the tank.
4. Design calculations for required voltage, amperage & life expectancy.
5. Safety program documentation and training outline.
6. Report of all test results after installation.

3.6 Protection Criteria and Start-Up. The tank-to-water potentials at which the cathodic protection is set to operate shall be in accordance with the criteria for protection in the National Association of Corrosion Engineers Standard RP-01-69, current edition. After the installation is completed, the cathodic protection shall be energized and adjusted for optimum operation by a trained employee of the manufacturer. Start-up service shall be in performed in accordance with AWWA D104 Section 5.2 Testing. This start-up service shall be coordinated with the Owner or his representative. After the cathodic protection is adjusted, measurements of tank-to-water potential shall be taken using a copper-copper sulfate half cell as a reference electrode and a portable high impedance voltmeter. A minimum of five (5) locations shall be measured. All test data shall be reviewed and evaluated by the Corrosion Specialist. The final test and adjustment of the system shall be conducted approximately twelve (12) months after the start-up service. In addition to the start-up service, "as-built" drawings and an Owners Maintenance Manual shall be submitted to the purchaser. A report shall be submitted which includes all of the test results obtained.

3.7 Installation. The cathodic protection shall be installed by personnel specifically trained in the work by the manufacturer of the cathodic protection equipment and who are regularly engaged in the installation and servicing of this equipment for water tanks. The cathodic protection constructor shall have a minimum of ten (10) years experience installing and servicing the types of systems described in this specification. These personnel shall be direct employees of the manufacturer, and shall be subject to Federal Substance Abuse and Testing Regulations and have an active safety training program in place.

The installation of the cathodic protection shall be closely coordinated with other work under this contract. All brackets required to be welded or otherwise fastened to the tank structure shall be

installed prior to painting or coating of the tank and all other cathodic protection components shall be installed after the interior painting work or coating is completed and the coating has fully cured. The cathodic protection rectifier and control unit shall be mounted at the location as shown on the drawings.

3.8 Performance. All work shall be in accordance with the following requirements:

1. Components of the cathodic protection system shall be installed in the manner and at the locations as shown on the design drawings prepared by the Corrosion Specialist.
2. Pressure entrance fitting shall be installed in accordance with AWWA D100.
3. Welding, cutting, and coating shall be in accordance with AWWA Standards D100, D102 & D105
4. Welding of steel coupling and anchors for horizontal anode suspension and rectifier mounting bracket shall be performed by the prime contractor prior to coating the tank. The cathodic protection constructor shall furnish drawings and materials to the prime contractor prior to coating.
5. Verification of electrical continuity of all sections of bolted or riveted tanks shall be the responsibility of the purchaser of the cathodic protection system.
6. Materials and equipment shall be inspected prior to installation. Any defective component shall be repaired or replaced.
7. Electrical work shall be in accordance with the National Electrical Code.
8. Lead wires shall be installed to prevent damage from abrasion.
9. Electrical connections within the tank shall be sealed to prevent water migration.
10. The rectifier shall be mounted at a convenient height (eye level) above grade for monitoring and service purposes.
11. A.C. power to the rectifier shall be furnished by the purchaser.
12. Disinfection of the tank shall be the responsibility of the purchaser.
13. Work provided by the constructor shall be completed in a clean and safe manner.

3.9 Guaranty. All workmanship, materials and equipment shall be guaranteed for a period of one year from date of substantial completion of this contract. The contractor shall guaranty that the cathodic protection, when maintained in operation in accordance with the manufacturer's instructions, will provide protection against corrosion of the submerged surface inside the tank. In the event corrosion is not prevented, the contractor shall, at his own expense, make whatever changes are necessary in the cathodic protection to prevent corrosion.

3.10 Inspection and Maintenance. The cathodic protection constructor shall furnish self-addressed report cards to be completed by the owner. Report cards received by the cathodic protection constructor during the guarantee and service period(s) shall be evaluated for system performance.

After completion of the cathodic protection installation, an annual inspection and maintenance agreement proposal shall be submitted for future consideration by the owner. This inspection agreement shall provide for complete maintenance of the system on an annual basis after the guaranty period expires or in the event the anode system must be replaced due to damage. The agreement for annual inspection and potential testing shall be in accordance with AWWA D104, Appendix C and include as a minimum:

1. One (1) annual job site visit.
2. Tank-to-water potential measurements conducted at representative locations within the tank. A minimum of five (5) locations shall be measured.
3. Measurements shall be conducted with a portable high impedance voltmeter and a calibrated copper-copper sulfate reference electrode.
4. Adjustments for optimum corrosion control shall be in accordance with criteria for

protection.

5. Data recorded shall provide sufficient information to evaluate the performance for the system relating to criteria for protection.
6. In the event additional work is required, the constructor shall submit a report with recommendations for optimizing corrosion control.

3.11 Manufacturer. The cathodic protection system shall be designed, manufactured and installed by Corpro Waterworks, or approved equal. Contact information for Corpro Waterworks is as follows: 1055 West Smith Road, Medina, OH 44256 Tel: 330-723-5082 Fax: 330-723-6065.

3.12 Payment. Payment under this item shall be at the contract lump sum price bid for Cathodic Protection which payment shall constitute full compensation for furnishing all labor, materials, tools and equipment required to complete this item as shown on the drawings and specified herein.

4. FOUNDATION REPAIR WORK

4.1 Description. This item shall include all labor, materials, and equipment required for the repairs of the concrete tank foundation as shown on the drawings or specified herein.

4.2 General. Work performed under this item shall include removal of all grout and loose foundation concrete, pressure washing the concrete, concrete surface preparation to achieve a concrete surface profile (CSP) of 2-3 (refer to SSPC-SP13/NACE 6), repairing concrete with a patching and surfacing epoxy, install closed cell backer rod and polysulfide joint, applying a primer coat, and applying two (2) finish coats in accordance with all manufacturer's requirements. All components furnished under this item shall be the product of one manufacturer and shall comprise a complete concrete repair system with the exception of the closed cell backer rod and polysulfide joint sealant.

4.3 Materials. The following materials shall be furnished and placed by the Contractor as shown on the drawings and specified herein:

Epoxy Patching and Surfacing Compound– The epoxy patching and surfacing compound shall be low-viscosity, moisture-tolerant, 2-component, 100% solids epoxy compound and shall meet the requirements of ASTM C884. The epoxy patching and surfacing compound shall be Steel-seam FT910 Epoxy Patching and Surfacing Compound as manufactured by Sherwin Williams, or approved equal.

Closed Cell Backer Rod – The closed cell backer rod shall be closed cell, low density, polyethylene foam. The closed cell backer rod shall be Sika Foam Backer Rod Closed Cell or approved equal.

Polysulfide Joint Sealant – The polysulfide joint sealant shall be a high performance, non-sag, chemical resistant elastomeric joint sealant and shall meet the requirements of NSF/ANSI Standard 61, ASTM C-920, Type M, Grade NS, Class 25, Use NT, M, G, A and O. The polysulfide joint sealant shall be Thickol 2235M Industrial Polysulfide Joint Sealant, non-sag, as manufactured by PloySpec, or approved equal.

Primer Coat: Corobond 100 Epoxy Primer/Sealer (4 mils DFT)

Finish Coat: two (2) coats of Hi-Solids Polyurethane 250 Aliphatic Polyurethane (4 mils DFT each)

4.4 Delivery, Storage, and Handling. All materials shall be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged materials shall be removed from the site immediately. All materials shall be stored off the ground and protected from rain, freezing, or excessive heat until ready for use. The product shall be conditioned, as recommended by the manufacturer, prior to use.

4.5 Weather Limitations. Contractor shall comply with manufacturer's recommendations for appropriate weather conditions for installation. Contractor shall not apply any material if it is precipitating or if such conditions appear to be imminent. The minimum temperature prior to application shall be 55° F and rising.

4.6 Surface Preparation and Application. Contractor shall perform surface preparation and apply the foundation repair materials in accordance with the manufacturer's recommendations and as follows:

1. All grout and loose and deteriorated concrete shall be removed with a hand tool to provide a surface that is free of dust, laitance, grease, curing compounds, impregnations, waxes, etc.;
2. Pressure wash the surface with a 4,000 psi pressure washer to remove all dirt and debris; Surface preparation shall meet SSPC-SP13/NACE 6 standard with a CSP of 2-3.
3. Any cracks, pits, or surface deterioration in the concrete foundation shall be covered and filled by placing epoxy surfacing and patching compound by squeegee, trowel, putty knife, or airless spray application; For larger defects in concrete, one to four quarts of 30 to 100 mesh aggregate may be added per gallon of mixed FT910, depending on the size of hole and slump required.
4. Install closed cell backer rod and polysulfide joint sealant to the entire perimeter of the chine foundation unless instructed otherwise. Areas to be done will be marked by the city;
5. Apply Primer coat;
6. Apply finish coats concurrently with Item 1 Painting Work finish coats.

4.7 Removal and Disposal. Contractor shall be responsible for removal of any items designated or otherwise required to be removed during the performance of work under this item. All items that are removed shall become possession of the Contractor and the Contractor shall be responsible for disposal in accordance with all applicable regulations.

4.8 Payment. Payment under this item shall be at the contract lump sum price bid for the various items under Foundation Repair Work, which payment shall constitute full compensation for furnishing all labor, materials, tools, and equipment required to complete this item as shown on the drawings and specified herein.