

SECTION 15450 - POTABLE-WATER STORAGE TANKS

Project Number 14-5006-39

Project title Kansas City Area Transportation Authority
Service Line Reversal (FOR INFORMATION ONLY)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Plastic, pressure, potable-water storage tanks.
 - 2. Plastic, nonpressure, potable-water storage tanks.

1.3 DEFINITIONS

- A. HDPE: High-density polyethylene plastic.
- B. LDPE: Low-density polyethylene plastic.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for water storage tanks.
 - 2. Include rated capacities, operating characteristics, and furnished specialties and accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of potable-water storage tank, from manufacturer.
- B. Source quality-control reports.
- C. Purging and disinfecting reports.

1.6 QUALITY ASSURANCE

- A. ASME Compliance for Steel Tanks: Fabricate and label steel, ASME-code, potable-water storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," Division 1.
- B. ASME Compliance for FRP Tanks: Fabricate and label FRP, ASME-code, potable-water storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section X, "Fiber-Reinforced Plastic Pressure Vessels."
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic potable-water storage tanks and components. Include appropriate NSF marking.
- D. Comply with NSF 61, "Drinking Water System Components - Health Effects," for potable-water storage tanks. Include appropriate NSF marking.

1.7 COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 PLASTIC, PRESSURE, POTABLE-WATER STORAGE TANKS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. [Pentair, Inc.: Park International Water Group.](#)
 - 2. [Tankinetics, Inc.](#)
- B. Description: FRP, vertical, pressure-rated tank with cylindrical sidewalls.
- C. Construction: ASME code, composite FRP or filament-wound, thermosetting-resin tank for 150-psig (1035-kPa) working pressure.
 - 1. Tank Lining Material: Nontoxic HDPE complying with NSF 61 barrier materials for potable-water tanks.
- D. Manhole: Watertight, for tank more than 36 inches (915 mm) in diameter; same pressure rating as tank.
- E. Tappings: Factory-fabricated, FRP flanged-end nozzle.
 - 1. NPS 2 (DN 50) and Smaller: Include plastic-to-steel transition fitting from tank nozzle flange to ASME B1.20.1, female thread.
 - 2. NPS 2-1/2 (DN 65) and Larger: ASME B16.5, flanged.

- F. Specialties and Accessories: Include tappings in tank and the following:
1. Pressure relief valve.
 2. Pressure gage.
 3. Thermometer.
 4. All additional pipe and accessories' connections as required by bus wash manufacturer for proper operation of bus wash system.
- G. Vertical Tank Supports: Factory-fabricated steel legs or FRP skirt attached by FRP brackets to tank sidewall.
- H. Tank Interior Finish: Materials and thicknesses complying with NSF 61 barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.

2.2 PLASTIC, NONPRESSURE, POTABLE-WATER STORAGE TANKS

A. FRP Potable-Water Storage Tanks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Amprotec, Inc.; Tank System Division.](#)
 - b. [Belding Tank Technologies, Inc.](#)
 - c. [L. F. Manufacturing, Inc.](#)
 - d. [Palmer Manufacturing and Tank Company.](#)
2. Description: FRP, vertical, nonpressure-rated water tank; complying with NSF 61 barrier materials for potable-water tanks.
3. Construction: ASTM D 3299, filament-wound FRP.
4. Tappings: Factory-fabricated, FRP flanged-end nozzle.
 - a. NPS 2 (DN 50) and Smaller: Include plastic-to-steel transition fitting from tank nozzle flange to ASME B1.20.1, female thread.
 - b. NPS 2-1/2 (DN 65) and Larger: Flanged.
5. Vertical Tank Support: Separate factory-fabricated steel stand capable of supporting tank.

B. PE Potable-Water Storage Tanks:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. [Amprotec, Inc.; Tank System Division.](#)
 - b. [Assmann Corporation of America.](#)
 - c. [Chem-Tainer Industries.](#)
 - d. [Poly Processing Company.](#)

- e. [Premier Plastics Inc.](#)
 - f. [Snyder Industries, Inc.](#)
 - g. [Steel Tank and Fabricating.](#)
 - h. [TolPlast Company, Inc.](#)
- 2. Description: PE, vertical, flat-bottom, nonpressure-rated water tank; complying with NSF 61 barrier materials for potable-water tanks.
 - 3. Construction: ASTM D 1998, molded PE.
 - 4. Tappings: Factory-fabricated bulkhead fittings attached to tank.
 - a. NPS 2 (DN 50) and Smaller: With female thread.
 - b. NPS 2-1/2 (DN 65) and Larger: Flanged.
 - 5. Vertical Tank Support: Separate factory-fabricated steel stand capable of supporting entire bottom of tank.
- C. Manhole: Watertight, for tank more than 36 inches (915 mm) in diameter.
- D. Cover for Open Tank: Plastic, same as or similar to tank material and with shape that encloses top of tank.
- E. Specialties and Accessories: Include tappings in the tank and the following:
- 1. Vacuum relief valve.
 - 2. Free air vent with insect screen.
 - 3. Thermometer.
 - 4. Gage glass, brass fittings, compression stops, and gage-glass guard.

2.3 SOURCE QUALITY CONTROL

- A. Test and inspect potable-water storage tanks according to the following tests and inspections and prepare test reports:
- 1. Pressure Testing for ASME-Code, Potable-Water Storage Tanks: Hydrostatically test to ensure structural integrity and freedom from leaks. Fill tanks with water, vent air, pressurize to 1-1/2 times tank pressure rating, disconnect test equipment, hold pressure for 30 minutes with no drop in pressure, and check for leaks.
 - 2. Pressure Testing for Non-ASME-Code, Pressure, Potable-Water Storage Tanks: Hydrostatically test to ensure structural integrity and freedom from leaks at pressure of 50 psig (345 kPa) above system operating pressure, but not less than 150 psig (1035 kPa). Fill tanks with water, vent air, pressurize tanks, disconnect test equipment, hold pressure for two hours with no drop in pressure, and check for leaks.
 - 3. Testing for Nonpressure, Potable-Water Storage Tanks: Fill tanks to water operating level to ensure structural integrity and freedom from leaks. Hold water level for two hours with no drop in water level.
- B. Repair or replace tanks that fail test with new tanks, and repeat until test is satisfactory.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install water storage tanks on concrete bases, level and plumb, firmly anchored. Arrange so devices needing servicing are accessible.
 - 1. Install horizontal tanks on fabricated steel supports and saddles.
- B. Anchor tank supports and tanks to substrate.
 - 1. Use steel or FRP straps over or around plastic tanks.
- C. Install tank seismic restraints.
- D. Install thermometers and pressure gages on water storage tanks and piping if indicated. Thermometers and pressure gages are specified in Section 15126 "Meters and Gages for Plumbing Piping."
- E. Install the following devices on tanks where indicated:
 - 1. Pressure relief valves.
 - 2. Temperature and pressure relief valves.
 - 3. Vacuum relief valves.
 - 4. Tank vents on nonpressure tanks.
 - 5. Connections to accessories.
- F. After installing tanks with factory finish, inspect finishes and repair damages to finishes.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in Section 15140 "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to potable-water storage tanks to allow service and maintenance.
- C. Connect water piping to water storage tanks with unions or flanges and with shutoff valves. Connect tank drains with shutoff valves and discharge over closest floor drains.
 - 1. General-duty valves are specified in Section 15111 "General-Duty Valves for Plumbing Piping."
 - a. Valves NPS 2 (DN 50) and Smaller: Gate or ball.
 - b. Valves NPS 2-1/2 (DN 65) and Larger: Gate or butterfly.
 - c. Drain Valves: NPS 3/4 (DN 20) gate or ball valve. Include outlet with, or nipple in outlet with, ASME B1.20.7, 3/4-11.5NH thread for garden-hose service, threaded cap, and chain.

2. Water Piping Connections: Make connections to dissimilar metals with dielectric fittings. Dielectric fittings are specified in Section 15140 "Domestic Water Piping."
3. Connect air piping to hydropneumatic tanks with unions or flanges and gate or ball valves. Make connections to dissimilar metals with dielectric fittings, which are specified in Section 15211 "General-Service Compressed-Air Piping."

3.3 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Section 15076 "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform the following final checks before filling:
 1. Verify that air precharge in precharged tanks is correct.
 2. Test operation of tank accessories and devices.
 3. Verify that pressure relief valves have correct setting.
 - a. Manually operate pressure relief valves.
 - b. Adjust pressure settings.
 4. Verify that vacuum relief valves are correct size.
 - a. Manually operate vacuum relief valves.
 - b. Adjust vacuum settings.
- B. Filling Procedures: Follow manufacturer's written procedures. Fill tanks with water to operating level.

3.5 CLEANING

- A. Clean and disinfect potable-water storage tanks.
- B. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed, use procedure described in AWWA C652 or as described below:
 1. Purge water storage tanks with potable water.
 2. Disinfect tanks by one of the following methods:
 - a. Fill tanks with water-chlorine solution containing at least 50 ppm (50 mg/L) of chlorine. Isolate tanks and allow to stand for 24 hours.
 - b. Fill tanks with water-chlorine solution containing at least 200 ppm (200 mg/L) of chlorine. Isolate tanks and allow to stand for three hours.
 3. Flush tanks, after required standing time, with clean, potable water until chlorine is not present in water coming from tank.

4. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination made by authorities having jurisdiction shows evidence of contamination.
- C. Prepare written reports for purging and disinfecting activities.

END OF SECTION 15450

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