

SECTION 22 13 63  
FACILITY BLACK-WATER STORAGE TANKS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fiberglass, nonpressure, water storage tanks.

1.2 ACTION SUBMITTALS

A. Manufacturer's Literature and Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Detail fabrication and assembly of fiberglass storage tank for sanitary sewer discharges to be collected and pumped out for disposal off-site.
4. Include diagrams for installation of all required appurtenances and tie downs or applicable fixatives utilized.

C. Delegated-Design Submittal: For facility black-water storage tanks.

1. Include design calculations for selecting vibration isolators and for designing vibration isolation bases.

1.3 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Certificates: For black-water storage tanks, accessories, and components, from manufacturer.

B. Welding certificates.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. As-built drawings

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Surface water-storage tank, including structural reinforcement and foundation, shall be capable of withstanding the effects of dead and live gravity loads and winds of 100 mph.

B. Seismic Performance: Surface water-storage tank, including structural reinforcement and foundation, withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
  2. Component Importance Factor: 1.5.
  - C. Thermal Movements: Surface water-storage tank, including structural reinforcement and foundation, shall allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
    1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
  - D. Comply with AWWA D120, "Thermosetting Fiberglass-Reinforced Plastic Tanks."
- 2.2 PLASTIC, NONPRESSURE, WATER STORAGE TANKS
- A. FRP Water Storage Tanks:
    1. Description: FRP, vertical, nonpressure-rated water tank.
    2. Construction: ASTM D 3299, filament-wound or ASTM D 4097, contact-molded FRP.
    3. 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.
        - 1) Exception: Tappings may be threaded FRP coupling integral with nozzle for connections for plastic piping.
      - b.
    4. Vertical Tank Support: Separate factory-fabricated steel stand capable of supporting tank.
  - B. Manhole: Watertight, for tank more than 36 inches in diameter.
  - C. Specialties and Accessories: Include tappings in 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.

- D. Labeling:
  - 1. The tank shall be labeled with the contents, design capacity, and maximum working capacity.
  - 2. Minimum font size: 4"
  - 3. Label shall be black on a white background, self-adhesive, with UV resistivity.

## 2.3 PAINT MATERIALS

- A. Paint: Comply with AWWA D102.
- B. Primer: Tank fabricator's standard epoxy-polyamide paint.
- C. Tank Shell Exterior Intermediate Paint: Tank fabricator's standard, two-component epoxy paint compatible with prime and finish paint. Intermediate coat shall have a slight color contrast with finish coat.
- D. Tank Shell Exterior Finish Paint: Tank fabricator's standard urethane paint.
  - 1. Color: As selected by COR from tank manufacturer's paint chart.

## 2.4 SHOP PAINTING

- A. Tank Shell Exterior Finish Coat: Factory coating according to AWWA D103.

## 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.
- B. Vertical Water Storage Tanks:
  - 1. Install on cast-in-place concrete equipment base(s). Comply with requirements for equipment bases and foundations specified in Section 033000 "Cast-in-Place Concrete."
  - 2. Comply with requirements for vibration isolation and seismic control devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- C. Anchor tank supports and tanks to substrate.
  - 1. Use steel or FRP straps over or around plastic tanks.
- D. Install tank seismic restraints. Install thermometers and pressure gages on water storage tanks and piping if indicated. Thermometers and pressure gages are specified in Section 220519 "Meters and Gages for Plumbing Piping."
- E. Install the following devices on tanks:
  - 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 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Tank Weld Test: Use radiographic method according to AWWA D100. Repair failures and retest.

2. Leak Test: Comply with AWWA D100 and NFPA 22. Fill tanks with water and test for leaks after installation. Repair leaks and retest until no leaks exist.

a. Water will be furnished by COR.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Water storage tanks will be considered defective if they do not pass test and inspections.

C. Prepare test and inspection reports.

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