

SECTION 13215 - UNDERGROUND STORAGE TANKS

City of San Diego, CWP Guidelines

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NTS: Portions of this Section, pertaining to the FRP tanks (design, fabrication, installation, testing, etc.) must be reviewed by the FRP engineer retained by the Design Consultant. See Section 06610 for selection and qualifications of the FRP engineer.

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PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing double wall fiberglass, underground, [fuel oil storage] tanks, complete and operable with all equipment, materials, tools, supplies, fittings, appurtenances, supports, anchorage and hook-up, controls and accessories.
- B. The WORK also requires that one manufacturer accept responsibility for furnishing the WORK as indicated but without altering or modifying the CONTRACTOR'S responsibilities under the Contract Documents.
- C. The WORK additionally requires that the one manufacturer who accepts the indicated responsibilities shall, as a minimum, manufacture the tank.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 13209 Fiberglass Reinforced Plastic Tanks

1.3 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:
 - 1. Bill of materials listing all components, resins, catalysts, promoters, ultraviolet light absorbers, agents, reinforcing materials with manufacturer's names, trade and identification marks.
 - 2. Laminate sequence of construction.
 - 3. Dimensions including anchor bolt layouts.
 - 4. Nozzle schedule including size, thickness and rating.
 - 5. Details of all clips and lugs for ladders, stairs, platforms, pipe brackets, and anchor bolts, as integral parts of the tank.

6. Details of structural support members.
7. Capacity (gallons).
8. Weight, empty and filled with water.
9. Structural calculations certified by a registered structural engineer in the State of California in proof of structural integrity.
10. Specifications for all bolting, gaskets and accessory items.
11. Documentation of at least one successfully performing project constructed in the recent past where tanks of comparable size and complexity were supplied, including contact names, addresses and telephone numbers.

1.4 SERVICES OF MANUFACTURER

- A. **Inspection, Startup, and Field Adjustment:** An authorized service representative of the manufacturer shall visit the site for not less than [] days and witness the following:
1. Installation
 2. Inspection, checking and adjustment
 3. Startup and field testing for proper operation

1.5 QUALIFICATIONS

- A. **Manufacturer:** Company specializing in the fabrication of underground double wall fiberglass reinforced plastic tanks with at least one successfully performing installation of comparable size and complexity constructed in the recent past.

PART 2 - PRODUCTS

2.1 UNDERGROUND TANK

- A. **Tank Construction:** Fuel oil storage tanks shall be manufactured to UL and National Fire Protection Association standards, of rib-reinforced fiberglass-reinforced polyester material and shall be chemically inert to petroleum products. The tanks, when empty, shall be capable of withstanding [] feet of overburden, with the hole fully flooded and a safety factor of 2.5:1 against buckling. When installed, the tanks shall withstand surface H-20 axle loads. Internally, the tanks shall withstand [5] psi air pressure with a 5:1 safety factor.
- B. **Tank Dimensions:** The dimension of the tank(s) shall be as follows:
- | | | |
|--------------------------|-----|---|
| Nominal capacity | - [|] |
| Nominal outside diameter | - [|] |
| Approx. overall length | - [|] |
- C. **Annular Space:** Tank shall have a space between the primary and secondary shell walls to allow for the free flow and containment of all leaked product from the primary tank.

Tank shall be designed to provide monitoring capabilities as noted:

1. Accessibility to the tank bottom between the primary and secondary walls to suit manufacturer's standard monitoring system.
2. The continuous monitoring system shall be compatible with the cavity between the inner and outer tank. The monitoring system shall be hydrostatic or electronic type as approved by local governing agency.

D. Tank Accessories: The following accessories shall be provided with each tank:

1. UL certification plate permanently affixed to tank.
2. Flanged manway, [22] inches (min.) diameter with gasket, bolts, and cover.
3. [Four]-inch diameter fill connection with drop tube and overflow prevention valve. The drop tube shall be a coaxial fill system and shall provide a self sealing vapor line by means of a spring-loaded assembly and adaptor.
4. Lifting lugs designed with 3:1 safety factor. Pipe connections of [4-inch] diameter half couplings, with reducers, for supply, return, vent, gauge and fill lines, to withstand a 150 foot-pound torque and 1000 foot-pounds of bending, both with 2:1 factor of safety.
5. [Four]-inch tight fill pipe cap with water and vapor tight seal.
6. Liquid Level Gauge: The gauge [8-inch] direct reading shall be of the mechanical type utilizing a float and counter weight principle. The gauge shall be calibrated in gallons and the gauge head mounted in the tank sump in a horizontal position. The gauge head shall be tapped to fit a [4-inch] fitting and shall be capable of measuring the amount of liquid in the tank to 1/2 of 1 percent of the tank volume.
7. Overflow containment vessel, a minimum of [12 inches] in diameter and [12 inches in depth], sealed to the riser tube. The vessel shall include a drain valve in the vessel bottom which in turn is connected to a 3/4-inch hose which taps into the riser pipe, allowing product to be drained into the underground storage tank.
8. Manhole Frame and Cover: The [30-inch] nominal ID covers shall be hot dip galvanized check plate designed for H2O wheel loads and be gasketed with hold screws. The covers shall have [14-inch] square ports for inspection.
9. Vent Backflow Valve: A vent backflow valve shall be provided.
10. Angle check valve extractor shall be installed on the fuel supply pipes at the tank.

E. Anchoring System: The CONTRACTOR shall provide and install a complete tank anchoring system consisting of straps of stainless steel or fiberglass reinforced plastic, concrete pad or deadman, and appurtenances, capable of securing the tank against the uplift forces experienced when the tank is completely submerged in groundwater while being completely empty, with a factor of safety of 2.5.

F. Bolts, Anchor Bolts, Washers, and Supports: The CONTRACTOR shall provide all bolts, anchor bolts, nuts, washers, and supports as required for all the plastic and fiberglass items indicated in this Section and in accordance with the requirements of the manufacturers of the plastic and fiberglass items. All bolts, anchor bolts, washers and supports required in connection with the plastic or fiberglass items provided under the Section shall be of Type 316 stainless steel.

2.2 LEAK MONITORING SYSTEM

- A. Leak monitoring equipment shall be provided to monitor leaks in tank annular space. The monitoring equipment shall be composed of the following:
1. Three (3) Level Sensor: Each unit shall be positioned vertically on the bottom of the tank annulus. The all-polysulfone level switch shall have an SPST contact, actuated by float of the unit.
 2. The liquid level detection monitor shall receive outputs of level sensors mounted in the tanks and shall continuously monitor the individual alarm modules via an intrinsically safe barrier. The sensors shall be approved for installation in Class 1, Division 1, Groups B, C, or D areas. In addition to the local red light and audible alarm the monitor shall be provided with a dry contact for common alarm remote indication.
 3. Three (3) conductors, #20 AWG shielded for appropriate length, shall be provided.

2.3 MANUFACTURERS

- A. Products of the type indicated shall be as manufactured by the following (or equal):

1. Tank

Owens-Corning Fiberglas Corp.
Xerxes Corporation

2. Fill drop tube:

Emco Wheaton A88

3. Liquid level gauge:

Pneumercator Model DR-3

4. Overall containment vessel:

Emco Wheaton A719-003

5. Vent backflow valve:

Emco Wheaton A79

6. Angle check valve extractor:

Emco Wheaton A 5634

7. Three level sensor:

Ronan Model LS-3

8. Liquid level detection monitor:

Ronan Model X76VS

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. **General:** The doublewall tank shall be tested prior to backfilling. Testing and backfilling shall be performed in accordance with the tank manufacturer's printed instructions and in accordance with local requirements.
- B. All tank accessories and the anchoring system shall be installed according to manufacturer's instructions and in accordance with local requirements.

**** END OF SECTION ****