

SECTION 132010
Ground Storage Tank for Water
(Bolted Steel)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing the factory-coated (galvanized) bolted steel tank for water storage required to complete the project.

2. GENERAL

The project shall consist of furnishing and erecting a 750,000-gallon potable water storage tank on concrete foundation. The tank shall have a nominal diameter of 73 feet with a 24' height. The tank shall have a minimum of 1:12 outward draining coned roof and a steel bottom. The tank shall be complete with all pipe connections, access openings, nozzles, taps, drains, ladders, vent. The Contractor to provide designs for tank and concrete foundation. All foundation design work shall performed by a registered professional engineer, licensed to practice in the state of Texas. The tank design shall be accompanied by a certification attested by the manufacturers design engineer that the design meets all TNRCC, AWWA, and NSF requirements.

3. MATERIALS

The tank shall meet all requirements of AWWA D103-97, NSF 61, and Title 30 Texas Administrative Code, Chapter 290.43. All metal components, hardware and accessories shall be galvanized. Zinc metal suitable for immersion in drinking water shall be applied to the parts after fabrication in accordance with the recommended practices of the American Hot Dip Galvanizers Association in compliance with ASTM 123 and ASTM 153.

4. DESIGN DATA

The following information shall be used as a basis for design and erection of the tank and appurtenances.

TANK CAPACITY - 750,000 gallons
DIAMETER - about 73 feet
HEIGHT - about 24 feet
OVERFLOW HEIGHT - 23' 6" or match existing overflow height
SEISMIC ZONE - 0
CONTENTS - potable water
WIND LOAD - 125 mph
OVERFLOW - 7,000 gpm
DRAWDOWN - 10,000 gpm for vent

5. ACCESSORIES

Shell manway shall be near bottom of shell ring, and be shown in the shop drawings submitted by the Contractor.

Provide inlet connection, outlet connection and overflow and drain outlet and show in submittal drawings.

Provide a 1-inch NPT tank connection for sampling and show in submittal drawings.

Overflow pipe shall be internal and external with internal weir with a minimum capacity of 7,000 gpm and shown on drawings.

Ladder shall be galvanized steel and be provided with a backguard safety cage and a lockable anti-climb assembly.

Steel handrail (top catwalk) shall be provided between exterior ladder and manways thru the roof, and between ladder and the screened vent. The handrail shall enclose a 100 square foot landing area at the manway. The handrail shall be capable of supporting 100 lb/ft lateral loading.

A 24" pressure-vacuum screened vent shall be provided on the roof. The vent shall have openings that facilitate removal of screen. The screen shall be 316 stainless steel with a minimum size of 24" x 24" x .018 wire mesh insect screen.

A separate pressure-vacuum relief valve/mechanism shall be provided which will operate in the event screens become clogged over with foreign material, and designed for 10,000 gpm draw-down.

The tank roof shall have two curbed; upward opening 30" square-opening lockable hatch located near the ladder and over the overflow weir. The curb shall extend 4" above the tank and have a 2" overlap with cover and gasket.

A pressure gage shall be mounted on the tank shell about 3" from the bottom. The gage shall be calibrated in feet of water and have a full-scale reading between 25 and 30 feet.

Gaskets and sealant shall meet AWWA, FDA, NSF61, AND EPA standards for potable water. Bolted connections shall incorporate a prefabricated gasket. Neoprene backed washers or approved equal shall be at all bolts/nuts in contact with the stored water.

6. SUBMITALS

Shop drawings (6 sets) shall be submitted for review and approval of the City of Corpus Christi prior to fabrication. The shop drawings shall be submitted on 24" x 36" drawings and include sufficient data to show that the tank and accessories conform to the requirements of the specifications. A professional engineer licensed in the state of Texas shall prepare and design the foundation, and associated appurtenances. The shop drawings shall include all erection drawings, accessories and foundation.

Submit mill test on steel plate and structural members demonstrating that the physical and chemical requirements of the specifications have been met.

7. CONSTRUCTION

Erection of the tank shall done in accordance with the manufacturer's recommendation. Particular care shall be exercised in handling and

bolting the tank plates, supports, and members to avoid abrasion or scratching the coating. Prior to placing water in the tank, a coating inspection of the entire tank will be performed. Touch-up coating in accordance with the manufacturer's recommendations shall be done where needed. The tank manufacturer's rep shall certify in writing to the City that the tank installation meets all manufacturers' requirements for installation.

8. CLEANING, DISINFECTION, INSPECTION & TESTING

Piping shall be pressure tested per 026202 the standard specs and disinfected per 026402 of the standard prior to testing tank.

The City shall provide water for initial test.

Cleaning and disinfection of interior surfaces shall be performed by the Contractor in accordance with AWWA C652. Disinfection shall be done with sodium hypochlorite (15% available chlorine) by Chlorination Method 3. After removal of all foreign material, all interior surfaces shall be thoroughly cleaned using a high-pressure water jet. All water dirt and foreign material accumulated in the cleaning operation shall be discharged from the tank. Approximately 1 foot (30,000 gallons) of potable water shall be added to the cleaned tank after which sodium hypochlorite shall be added to the water in the tank such that a chlorine concentration in water would be 50 mg/l when the tank is filled to 5% of the total storage volume (37,500 gallons). Approximately 13 gallons of sodium hypochlorite solution (15% available chlorine) shall be added to the 30,000 gallons of water in the tank. Add an additional 7,500 gallons of water in the tank to achieve 5% of the volume of the tank or a depth of 1.2 feet. This solution shall be held in the tank for not less than 6 hours. The tank shall then be filled to the overflow level by adding potable water to the concentrated solution. The tank shall be held full for not less than 24 hours. The water shall then be tested for coliform organisms by the Water Department.

If no leaks are observed at the end of the 24 hour holding period and satisfactory bacteriological testing and aesthetic quality water quality are achieved, the water in the tank may be incorporated into the distribution system, provided that the free chlorine residual is between 2 and 4 mg/l.

The City shall provide water for initial test. If the water is contaminated such that it can not be reincorporated into the distribution system, the Contractor shall be responsible for properly disposing of it and pay for the additional water.

9. MEASUREMENT & PAYMENT

Unless indicated otherwise in the proposal, Factory-Coated (Galvanized) Bolted Steel Tanks for water shall be measured as individual units. Payment shall include furnishing, erecting, testing, disinfecting, the completed tank, complete with foundation, piping and valving, and site preparation and shall compensate for all materials, labor, equipment, and incidentals required to complete the work.