

SECTION 13100

FACTORY POWDER COATED BOLTED STEEL STORAGE TANK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. This specification covers the furnishing of all labor, material, equipment, tools, services and erection of a 99,700 Gallon, Factory Powder Coated Bolted Steel Water Storage Tank, as manufactured by Superior tank Co., Inc., Rancho Cucamonga, CA or an approved equal, and as shown on the plans and specified herein.
- B. The bolted steel tank shall conform to the requirements of AWWA D103-09.

1.2 SUBMITTALS

- A. Shop Drawings: Submit shop drawings of the bolted steel reservoir and all accessories for review and approval by the engineer prior to beginning any related shop fabrication or erection. Include sufficient data to show that the reservoir and accessories conform to the requirements to these Specifications.
- B. Submittals shall include:
 - 1. Design calculations, signed by a civil or structural engineer registered in the State of Hawaii.
 - 2. Fabrication and erection drawings and details for the reservoir and all accessories.
 - 3. Certified mill tests on steel plate and structural members demonstrating that the physical and chemical requirements of this Specification have been met.

PART 2 - PRODUCTS

2.1 GENERAL DESCRIPTION

- A. The Manufacturer shall design, furnish, erect and test the tank, as required by AWWA D103-09. The Manufacturer shall be completely responsible for the construction and satisfactory performance of the tank during the guarantee period. The tank shall conform to AWWA D103-09, to the latest edition Building Code, and to the requirements of the plans and these Specifications. The supplier shall submit for approval complete and detailed plans for the tank and appurtenances.
- B. The Factory Powder Coated, bolted steel tank shall have a nominal capacity, usable capacity, and dimensions as listed below in the Design Data Section. A Cone roof, sloped

to drain toward the shell, shall be provided. Provide the reservoir complete with all pipe connections, access openings, nozzles, taps, drains, ladders vent, and other accessories as shown on the plans or required herein.

2.2 DESIGN DATA

A. The following data and information are supplied as a basis for design and erection of the tank and appurtenances:

1. Tank Capacity & Dimensions
 - a. Usable Capacity 99,700 Gallons
 - b. Outside Diameter 38'-7 5/8"
 - c. Tank Height 16'-1"
2. Seismic Design Criteria
 - a. Seismic Use Group Specify Per D103 14.2.1
 - b. Seismic Importance Factor, IE Specify Per D103 14.2.2
 - c. Site Class Specify Per D103 14.2.4
 - d. Ss Specify Per D103 14.2.3
 - e. S1 Specify Per D103 14.2.3
 - f. Fa Specify Per D103 14.2.6
 - g. Fv Specify Per D103 14.2.6
3. Design Wind Loading
 - a. Design Wind Speed, V Specify Per D103 15.1.2
 - b. Gust Factor, G Specify Per D103 15.1.1
 - c. Importance Factor, I Specify Per D103 15.1.1
 - d. Exposure Category Specify Per D103 15.1.3
4. Roof Design Loading

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| a. | Roof Live Load | Specify Per D103 5.2.3.1 |
| b. | Ground Snow Load | Specify Per D103 5.2.3.2 |
| 5. | Liquid to be stored | Non-Potable water |
| 6. | Allowable Soil Bearing Pressure | 1500 psf |

2.3 MATERIALS

- A. Plates and Sheets. Plates and sheets shall conform to appropriate ASTM designation as set forth in Section 4.4, AWWA D103-09, and shall have a minimum yield strength of 30,000 psi.
- B. Structural Shapes. Structural shapes shall conform to the requirements and ASTM designations of AWWA D103-09 section 4.5.
- C. Bolts. Tank joint bolting shall be minimum ½” diameter and shall meet the requirements of AWWA 103-09 section 4.2.1.
- D. Gaskets and Sealant. All gaskets and sealants used on this tank shall conform to the requirements of AWWA D103-09 section 4.10.

2.4 ACCESSORIES

- A. Shell Manhole: provide a 24”, minimum, hinged shell manhole located as shown on the drawings. The center of the manhole shall be located 30 inches above the bottom of the tank.
- B. Overflow pipe: Provide steel internal and external overflow pipe, if required, and supports as shown on the plans. Overflow pipe assembly shall be powder epoxy lined and coated.
- C. Ladders:
 - 1. Provide a galvanized steel welded exterior ladder with backguard as shown on the plans. The ladder shall have a lockable closure at the bottom.
 - 2. Provide a galvanized steel welded interior ladder. Safe-T-Climb assembly is optional.

- D. Roof Openings:
1. A 20 inch screened vent shall be provided on the roof. The vent shall be fabricated to provide removable screened openings between the vertical support members of the vent. The screen openings of the vent shall be sized by the manufacturer to all venting of a 3,000 gpm pumping rate. An effective area of 75% of screen opening shall be assumed. The screen shall consist of one layer of type 316 stainless steel: 16 x 16 x 0.018 wire mesh insect screen.
 2. The tank roof shall have a curbed, upward opening 24-inches square, minimum hatch located near the ladder. The curb shell extend at least 4 inches above the tank. The hatch cover shall be hinged and shall have locking provisions. The hatch cover lip shall extend for a distance of 2-inches down on the outside of the curb.
- E. Provide a Superior Tank Model #2400, Liquid Level Indicator with Type 316 stainless steel internals and complete with float and target board assembly.
- F. Sequence of Operation: As indicated on drawings.
1. Steel sheets shall have a minimum thickness of 12 gauge and shall conform to ASTM a 570, Grade 36, hot rolled structural quality, having a minimum yield strength of 36,000 psi.
 2. Steel plates shall conform to ASTM A283, Grade C, having a minimum yield strength of 30,000 psi.
 3. Structural Shapes: hot-rolled structural shapes shall conform to AISC S326. The material shall conform to ASTM A36.
- G. Bolts
1. Bolts and nuts for joining tank panels shall conform to ASTM A307, A325, A490, AWWA D103-09.
 2. Bolts shall be mechanically galvanized to ASTM A123.
 3. All bolt heads exposed to the interior of the tank shall be polycapped.
 4. Encapsulated nuts shall be furnished for all nuts exposed to the tank interior.
- H. Gaskets and sealants shall meet or exceed AWWA, FDA, and EPA standards for potable water.
- I. Anchor bolts and stirrups, if required, to be furnished by the tank manufacturer.

PART 3 – EXECUTION

3.1 PROTECTIVE COATING

- A. General: All metal plates, supports, members and miscellaneous parts, except bolts, shall be Factory Powder Coated in accordance with A.W.W.A. D103, Section 12.6 and this Section. Field coating, other than touch-up, will not be permitted.
- B. Surface Preparation:
 - 1. All steel surfaces shall be sandblasted to equivalent of a SP 10 commercial blast metal finish. The surface anchor pattern shall be no less than 1.5 mils.
- C. Coating:
 - 1. All interior steel surfaces, support members and miscellaneous parts shall receive 5 mils minimum average dry film thickness using DuPont “Tank Tan” (An NSF 61 Approved, Thermal Set Epoxy Powder Coating).
 - 2. All exterior steel surfaces, support members and miscellaneous parts shall receive 3 mils minimum average dry film thickness using DuPont “Superior Sand” (A Thermal Set TGIC-Polyester Powder Coating).

3.2 CONSTRUCTION

- A. Field erection of Factory Powder Coated Bolted Steel Tanks shall be in strict compliance with manufacturer’s recommendations and performed by manufacturer’s employees or certified erection crew to alleviate any potential disputes in coating quality or erection thereof. Particular care shall be exercised in handling and bolting of the tank plates, supports, and members to avoid abrasion or scratching the coating. Prior to placing water in the tank, a “holiday” inspection of the entire tank, corners included, will be provided and performed by the manufacturer in the presence of the owner. Touch-up coating shall be done per the manufacturer’s recommendations where needed and as directed.

3.3 TESTING AND INSPECTION

- A. General: Test storage tank after erection. Floor shall be clean and free from dirt, foreign substance and debris.
- B. Bottom: Vacuum test seams in floor plates.
- C. Shell: Test by filling with water to elevation of overflow. Completed storage tank shall show no leaks at end of 24 hours test period. No charge will be made for water required to fill tank.

3.4 WARRANTY

- A. Superior Tank Co., Inc., the tank manufacturer, shall warrant the tank against any defects in workmanship and materials for a period on two (2) years from the date of completion and acceptance by the Engineer. In the event any such defect should appear, it should be reported in writing to the manufacture during the warranty period.

3.5 FOUNDATION

- A. The concrete foundation shall be designed by the tank manufacturer and in accordance with the plans and specifications included herein.

END OF SECTION