**SPECIFICATIONS FOR**

**FACTORY POWDER COATED**

**BOLTED STEEL TANK**

**PART 1 GENERAL**

* 1. **SCOPE**

A. This specification covers the furnishing of all labor, material, equipment, tools, services and erection of a Factory Powder CoatedBolted Steel water storage tank, as manufactured by Superior Tank Co., Inc., Rancho Cucamonga, CA and as shown on the plans and specified herein.

B. The bolted steel tank shall conform to the requirements of American Water Works Association (AWWA) D103-19 Standard for Factory-Coated Bolted Carbon Steel Tanks for Water Storage.

C. The tank manufacturer shall be a specialist in design and fabrication with a minimum of (10) years documentation of experience and erection of factory coated bolted steel tanks. The manufacturer shall have an active ISO-9001 and API-Q1 registration, certified by a 3rd party company.

D. The determination of the bolted tank coating specified is based on engineer’s prerequisites **and the requirements for a premium factory applied coating system providing resistance to internal and external tank surface corrosion** and it has been determined that other coatings are considered inferior and will not be accepted.

**1.02 SUBMITTALS**

1. 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.

Submittals shall include:

1. Design calculations, signed by a civil or structural engineer registered in the State of ***{Enter State}.***
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**

**2.01 GENERAL DESCRIPTION**

A. The Manufacturer shall furnish, erect and test the tank, as required by AWWA.D103-19. 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 D103-19, 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 of ***{Specify Capacity}***gallons. It shall have a nominal diameter of ***{Specify Diameter}*** and a nominal height of ***{Specify Height}***. 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.

**2.02 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
2. Nominal Capacity *Specify Capacity*
3. Usable Capacity *Specify Capacity*
4. Inside Diameter *Specify Diameter*
5. Tank Height *Specify Height*
6. Seismic Design Criteria

a. Seismic Use Group *Specify Per D103-09 14.2.1 Table 2*

 *OR Risk Category Specify Per D103-19 14.2.1 Table 2*

b. Seismic Importance Factor, IE *Specify Per D103-19 14.1.2 Table 2*

c. Site Class *Specify Per D103 14.2.3*

d. Ss *Specify Per D103 14.2.2*

 e. S1 *Specify Per D103 14.2.2*

f. Fa *Specify Per D103 14.2.4*

g. Fv *Specify Per D103 14.2.4*

1. Design Wind Loading

a. Design Wind Speed, V *Specify Per D103 15.1.1.1.1*

b. Gust Factor, G *Specify Per D103 15.1.*

c. Exposure Category *Specify Per D103 15.1.1.2*

1. Roof Design Loading

a. Roof Live Load *Specify Per D103 5.2.5*

b. Ground Snow Load *Specify Per D103 5.2.4*

1. Liquid to be stored Potable water
2. Allowable Soil Bearing Pressure *Specify Bearing Pressure*
	1. **MATERIALS**
3. Plates and Sheets. Plates and sheets shall conform to appropriate ASTM designation as set forth in Section 4.4, AWWA D103-19, and shall have a minimum yield strength of 30,000 psi.
4. Structural Shapes. Structural shapes shall conform to the requirements and ASTM designations of AWWA D103-19 section 4.5
5. Bolts. Tank joint bolting shall be minimum ½” diameter, shall meet the requirements of AWWA D103-19 section 4.2 and have tensile strength of at least 120,000 pounds per square inch. Encapsulated hardware on interior required.
6. Gaskets and Sealant. All gaskets and sealants used on this tank shall conform to the requirements of AWWA D103-19 section 4.10.

**2.04 ACCESSORIES**

1. Shell Manhole: Provide a minimum 24" diameter, 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.
2. Pipe Connections:
3. Provide inlet nozzle, outlet nozzle with antivortex plate {recommended}, overflow and drain outlets as shown on the plans.
4. Provide a 1-inch NPT tank connection as shown on the plans for sampling connection.
5. Overflow pipe: Provide steel internal or external overflow pipe as show, internal weir box, if required, and supports, as shown on the plans. Overflow pipe assembly shall be powder epoxy lined and coated for corrosion protection.
6. Ladders:
7. Provide a galvanized steel welded exterior ladder with backguard, or cable fall arrest system as shown on the plans. The ladder shall have a lockable closure at the bottom.
8. Provide a galvanized or factory powder coated steel welded interior ladder, with cable fall arrest system as shown on the plans.
9. Provide partial (wing) handrails or full perimeter hand rails as shown on the plans.
10. Roof Openings:
11. A 20” diameter 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 screened openings of the vent shall be sized by the manufacturer to all venting of 3,000 gpm pumping rate. The screen shall consist of one layer of precision woven nylon mesh: 17x17, with an effective area of 0.75 ft2 of screen opening shall be assumed or Type 316 stainless steel: 16 x 16 with an effective area of 0.85 ft2 of screen opening shall be assumed.
12. The tank roof shall have a curbed, upward opening 24-inches square, minimum hatch located near the ladder. The curb shall 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.
13. Provide a Superior Tank Model # 2400, Liquid Level Indicator with Type 316 stainless steel internals and complete with float and target board assembly. (optional)
14. Gaskets and sealants shall meet or exceed AWWA, FDA, EPA and NSF61 requirements for potable water.
15. Anchor bolts and stirrups, if required, to be furnished by the tank manufacturer.

**PART 3 EXECUTION**

* 1. **PROTECTIVE COATING**
1. General: All metal plates, supports, members and miscellaneous parts, except bolts, shall be Factory Powder Coated in accordance with AWWA D103, Section 12.6 and this Section. Field coating, other than touch-up, will not be permitted.
2. Surface Preparation:
3. All steel surfaces shall be shot blasted to equivalent of a SP 10 or better near white metal finish. The surface anchor pattern shall be no less than 1.5 mils.
4. Spray a final Deionized water rinse with Silica-Zirconium (Si-Zr) sealer to prevent rusting prior to the powder coating application and provide additional level of corrosion protection
5. All steel surfaces shall drip dry for seven (7) minutes prior to entering the dry off oven for eight (8) minutes at 425 degrees F.
6. Coating:
7. All interior steel surfaces, support members and miscellaneous parts shall receive 5 mils minimum average dry film thickness using *Axalta or equal* "Tank Tan" (An NSF 61 Approved, Thermal Set Epoxy Powder Coating).
8. All exterior steel surfaces, support members and miscellaneous parts shall receive minimum 2 mils average dry film thickness “Tank Tan” primer under 3 mils minimum average dry film thickness using *Axalta or equal* "Superior Sand" (A Thermal Set TGIC-Polyester Powder Coating), for a total of 5 mils.
9. NOTE: Liquid coated, glass lined, or uncoated bolted tanks or FRP tanks are not considered equal.

**3.02 CONSTRUCTION**

1. 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 to achieve 100% holiday-free surface.

**3.03 TESTING AND INSPECTION**

1. General: Test storage tank after erection. Floor shall be clean and free from dirt, foreign substance and debris.
2. Bottom: Vacuum test seams in floor plates.
3. Shell: Test by filling with water to elevation of overflow. Completed storage tank shall show no leaks at end of 24 hour test period. No charge will be made for water required to fill tank.
4. Disinfection:
5. General: After testing has been satisfactorily completed, tank shall be disinfected.
6. Standards: Disinfecting of interior surfaces shall be performed in accordance with AWWA C652-86. After disinfection, the Owner shall take a water specimen for bacteriological test, as prescribed at Code 40 of the Federal Regulations, Sections 141.21 through 141.30, 141.41 and 141.42.
7. After disinfection, the tank shall be filled to the overflow level and allowed to stand for 5 days, minimum. After 5 days. the Owner shall take water specimens for V.O.C. test per EPA 502.2. The tank may be placed into service once acceptable test results are received.

**3.04 WARRANTY**

1. Superior Tank Co., Inc., the tank manufacturer, shall warrant the tank against any defects in workmanship and materials for a period of one (1) year from the date of shipment. In the event any such defect should appear, it should be reported in writing to the manufacture during the warranty period.

**3.05 FOUNDATION**

1. Tank foundation shall be concrete ringwall (Type 1) per AWWA D103-19 section 13.4.1 or granular berm with steel retainer ring (Type 5) per AWWA D103-19 section 13.4.5.

**END OF SECTION**

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