USA Tank Storage Systems
417-776-2500

14174 Hwy. 43, P.O. Box 506
Seneca, Missouri 64865 USA
Tel. 417-776-2500
Fax 417-776-2524

WATER TANK SPECIFICATIONS

BOLTED STEEL TANK
SECTION 13205

PART 1.00 – GENERAL

1.01 WORK INCLUDED

A. Tank Selection

The Engineer's selection of factory-coated bolted steel tank construction for this facility has been predicated upon the design criteria and construction methods specified. Deviations from the specified design and construction details will not be permitted.

B. Drawings and Specifications

Construction shall be governed by the drawings and specifications showing general dimensions and construction details. After approval by the Engineer of detailed erection drawings prepared by the Manufacturer, there shall be no deviation from theses drawings and specifications except upon written order or approval from the Engineer.

Three (3) copies of the shop drawings covering tank, anchors, accessories, appurtenances and coatings provided shall be submitted in accordance with the "Submittals" and "Drawings and Specification" sections.

C. Qualifications of Tank Manufacturer

The Tank Manufacturer shall be a specialist in the design, fabrication, and erection of factory-coated bolted steel tanks. The manufacturer shall be quality certified, have an active API-Q1 and an ISO 9001 registration.

D. Design Criteria

Job Site Location	Maximum Depth (Feet)
Product to be Stored	Minimum Freeboard (6 inches)
Specific Gravity	Design Pressure
PH of Product	Deck Live Load (15/25 PSF)
Temperature of Product	Wind Speed (100 MPH when completely erected)
Minimum Capacity (Gallons)	Seismic Zone
Diameter (Feet)	

1.02 REFERENCES

AWWA D103-97 – Bolted steel tank fabrication and erection

API 12B – Principals of standard specifications for bolted steel tank

Factory Mutual – Fire protection tanks

NFPA 22 – Chapter 4 – Water tanks for private fire protection, factory-coated, bolted steel tanks.

PART 2.0 – PRODUCTS

2.01 MATERIALS

A. Tank Structure

The materials, design, fabrication, and erection of the bolted steel tank shall conform to AWWA D103-97, to the Principles of Standard Specification 12B of the American Petroleum Institute, or to Columbian's specifications which are de-rived from engineering principles, industry experiences, and the aforementioned standards and specifications.

1. Steel

    a. Sheet. Steel sheets shall conform to or shall be at least equal to hot-rolled quality per ASTM A570 Grade 33 with a minimum yield strength of 33,000 psi. Minimum thickness shall be 12 gauge (0.0972" minimum)

    b. Plate. Steel plates shall conform to or at least be equal to the requirements of ASTM A36 with a minimum yield strength of 36,000 psi.

c. Rolled Structural Shapes. Rolled structural shapes shall conform to ASTM A36.

2. Bolts

a. Galvanized bolts, nuts, and washers used in tank joints shall be minimum ½ inch bolt diameter and shall meet the minimum requirements of API 12B, Appendix A, except that bolt heads and nuts may be other than square at the option of the tank manufacture.

b. Poly-capped bolt heads shall be used for additional corrosion protection.

c. Other bolts shall conform to or at least be equal to the latest revision of ASTM A307.

Option:

Additionally, any steel nuts that are in contact with the liquid in the tank can be factory-encapsulated so that the nut forms one piece with the corrosion-resistant encapsulation material.

3. Gaskets

a. All bolted connections shall incorporate an EPDM (Buna N)* prefabricated gasket minimum width 1 ¾". A single piece double-punched gasket shall be used at vertical seams, which require two vertical rows of punching. Field caulking will be allowed when joining a discontinuous gasket section and at certain joint connections. Neoprene backed steel washers shall be provided at all bolts in contact with the stored liquid. No mastic sealant shall be used as the primary method of sealing the tank.

*Note – Use of Buna N for wastewater applications only.

4. Multiple Row Punching

All sheets in the shell of the tank that requires multiple vertical row punching (double or triple) must be in single stroke to insure proper alignment.

B. Appurtenances

1. The contractor shall furnish and install the appurtenances as shown on the contract drawings and as specified below.

2. Unless otherwise noted, standard appurtenances shall be as follows:

a. Hatch. The tank roof hatch shall have a curbed, upward opening 24" square. The curb shall extend at least four inches above the tank. The hatch cover lip shall be hinged and provisions made for locking. The hatch cover lip should extend for a distance of two inches down on the outside of the curb.

b. Inlet and Outlet Connections. Inlet, outlet, and overflow connections shall conform to the sizes and locations specified on the plan sheets.

c. Vent. A mushroom-screened vent shall be furnished above maximum water level of sufficient size to accommodate normal inlet and outlet flow. The overflow pipe shall not be considered to be a tank vent. The vent shall be so designed and constructed as to prevent the entrance of birds or animals.

d. Outside Tank Ladder. An outside OSHA ladder shall be furnished at the location designated.

e. Galvanized Handrail and Toeboard. Handrail and toeboard around the deck perimeter shall be installed as specified on the plan sheets.

f. Liquid Level Indicator. A liquid level indicator with stainless steel float and target board shall be installed as detailed on the plans and to the tank manufacture's specifications.

g. Internal Nozzle with Overflow Weir Cone. The internal nozzle with overflow weir shall conform to the size and location specified on the plan sheets.

h. 24" x 46" Flush Cleanout Door (24" Diameter Shell Manway). The flush cleanout door (shell manway) shall conform to the sizes and locations specified on the plan sheets.

C. Coating

All metal plates, supports, members, and miscellaneous parts, except bolts, certain accessories, and appurtenances, shall be factory coated in accordance with the provisions of these specifications. Field coating, except for touch-up will not be permitted.

Interior: Thermally cured epoxy Trico-Bond 478 by Columbian Tec Tank or equal.

Exterior: Amine Epoxy primer with baked acrylic finish coat or equal.

2.02 ACCEPTED TANK SUPPLIER

The steel tank and accessories furnished under this section shall be supplied by USA Tank Storage Systems of Seneca, Missouri (417-776-2500).

PART 3.00 – EXECUTION

3.01 APPLICATION PROCEDURES FOR FACTORY COATING

A. Surface Preparation

1. Tank parts are thoroughly washed and rinsed to remove grease, oil, and foreign matter.

2. Parts are then immediately oven-dried.

3. Parts are grit-blasted to SSPC-SP10-63T (near white blast cleaning) to 1-2 mil profile.

4. All parts must be coated within 15 minutes after blasting, and no further processing other than coating application shall be done.

B. Interior Coating

1. Thermally cured modified epoxy power, Trico-Bonded EP by Columbian Tec Tank Company (includes underside of the steel floor).

2. Electrostatic applications of FDA and NSF approved thermoset epoxy, 5.0 mil average dry film thickness.

C. Exterior Coating

1. Thermally cured modified epoxy powder, Trico-Bond EP and acrylic polyurethane by Columbian Tec Tank Company.

2. First coat is to be a powder application of modified epoxy Trico-Bond EP, 2.5 mils average dry film thickness.

3. Second coat of acrylic polyurethane, 1.5 mil average dry film thickness.

Option:

A. <u>Exterior Coating – Z-Bond EP optional exterior coating</u>

1. One coat Zinc rich primer, 2.0 – 2.5 mils average dry film thickness

2. One coat electrostatic application of FDA and NSF accepted thermoset epoxy, Trico-Bond EP as top coat 5.0 mils average dry film thickness

3. One coat urethane top coat, 1.5 mils average dry film thickness

4. Coating system to have 8.5 mils average total dry film thickness.

3.02 DRYING AND SHIPPING COATED PARTS

A. Curing

1. Baking ovens to be used after each coat. Final coat is to be cured in bake oven for at least 15 minutes.

B. Preparation for Transport

1. Material to be marked or tagged with part number and order number for field assembly requirements.

2. Tank material to be placed in racks or on pallets to facilitate transportation to jobsite. The racks will also prevent scratching by erection crews.

3. Touch-up paint with instructions for application by erection personnel.

3.03 TANK FOUNDATION

1. The tank foundation shall be designed by the Owner's Engineer to safely sustain the loads from the tank.

2. Steel Bottom Tanks. The foundation shall be installed per AWWA D103-97, Section 11.4. Supplying and installing these foundation materials shall be the responsibility of the customer.

3. The foundations shall be level with differential not exceeding +/- 1/8 inch in any 30-foot circumference under the shell. The levelness on the circumference shall not vary more than +/- ¼ inch from an established plane.

Option:

Base setting stave placement and concrete shall be done in accordance with the tank manufacturer's recommendations. The tank manufacturers shall certify the placement of the setting stave.

3.04 SHIPPING

All plates, supports, members, and miscellaneous parts shall be packaged for shipment in such manner to prevent abrasion or scratching of the finished coating.

3.05 ERECTION

Field erection of factory-coated bolted steel tanks shall be factory certified in accordance with the tank manufacture's recommendations. Particular care shall be exercised in handling and bolting of the tank plates, supports, and members to avoid abrasion or scratching of the coating. Touch-up coating shall be done in accordance with tank manufacturer's recommendations where and as directed.

4.00 – TESTING

4.01 Testing

Following completion of erection and cleaning of the tank, the tank shall be tested for liquid-tightness by filling the tank to its overflow elevation. The Contractor, in accordance with the tank manufacturer's recommendations shall correct any leaks disclosed by this tank test. The Owner, without charge, shall furnish water required for testing at the time of erection completion.

5.00 WARRANTY

5.01 Warranty

The tank manufacture shall warrant the tank system against any defects in workmanship and materials for a period of one (1) year from the date of final acceptance. In the event any defect should appear, it shall be reported in writing to the manufacturer during warranty period.

END OF SECTION