SECTION 13205

**AWWA D100-05 WELDED STEEL RESERVOIR SPECIFICATIONS**

**REFERENCE SPECIFICATIONS, CODES AND STANDARDS.**

**Commercial Standards:**

* AWWA/ANSI D100-11 Welded Steel Tanks for Water Storage
* ASTM A36-01 Specification for Structural Steel
* AWWA/ANSI C652-92 Disinfection of Water Storage Facilities

**1. DESIGN OF WELDED STEEL RESERVOIR.**

Reservoir shall be flat-bottomed welded steel tanks constructed at ground level.

Reservoir shall have a conical roof with interior supporting structural members.

Design of the tank shall conform to AWWA Standard **D100-11** as applicable and as modified herein.

The alternative design, in Section 14 of the AWWA **D100-11** is permitted.

**2. Tank and Foundation Design.**

Detailed design drawings, design criteria, calculations (including seismic) for the welded steel tanks and foundation signed and sealed by a registered Structural/Civil Professional Engineer in the USA.

**3. Roof Live Load:**

Provision shall be made for a minimum roof live load with 20 **PSF** uniform service load applied to roof.

**4. Snow Load:**

Provision for snow load may not be required. Depending on the geographic location of the reservoir this provision will be determined during the design and engineering stage of the project.

**5. Site Class:**

Geotechnical Report/Soils Investigation, or Geotechnical engineer shall reveal project’s Site Class for the design and engineering purposes of the reservoir and tank foundation.

**6. Specific Gravity:**

1.0 will be used during the design and engineering stages.

**7. SUBMITTALS**

Complete design drawings of the tank and all other items and appurtenances.

Drawings shall include all dimensions, layout of plates, locations and types of fittings/orientation plan, attachments and flanges.

Structural calculations for the design, including wind and seismic loading, shall be prepared and sealed by a structural PE.

Submittals shall be reviewed and approved by the Engineer prior to the start of fabrication.

**8. GENERAL**

Welded steel reservoir shall be designed and fabricated in accordance with AWWA D100-11,

except as modified in the Contract Documents.

Steel plates shall conform and structural shapes shall conform to **ASTM A36 or ASTM A36M** carbon steel.

* **Mill Tests Reports (MTRs).**

Mill test reports for steel plates shall be submitted.

**9. BOTTOM**

The reservoir bottom shall be assembled bythe lap joint method of construction as specified

in Section 8 of AWWA **D100-11.**

**10. SHELL**

Shell plates shall be cold rolled to the tank radius.

Horizontal and vertical joints shall be butt welded on each side with full penetration.

Top angle rings shall be rolled to the tank radius.

**11. ROOF**

Roof shall be CS cone type and composed of CS Roof plates shall be min. 3/16” thk. and lap welded in design on top side only.

Roof support columns shall be fabricated form structural steel shapes and shall be provided with base bearing plates.

**12. ACCESSORIES**

1. **Manholes:**

Shell manholes shall be 30 inches in diameter and shall be hinged to the

Shell. Manholes shall be gasketed and watertight.

1. **Overflow:**

The tank shall have an overflow to grade with weir box.

1. **Ladders and Platforms:**

Reservoir shall have one external ladder (vertical caged ladder or spiral stairway) and one optional vertical internal ladder - Ladders shall meet the requirements of AWWA D100-011 and OSHA.

Internal ladder shall be accessible from the roof hatch.

External ladder shall be mild steel (painted or galvanized) and shall include steel pipe guard railing and access platform if required.

1. **Roof Hatch:**

Roof hatches shall be steel with hinges and locking hasps.

The hatch opening shall be 36” x 36”.

1. **Vent:**

Tank vent shall be provided on the roof.

1. **Drain:**

Tank drain shall be provided as required.

1. **Handrails:**

360 degree or partial guardrails shall be provided as required.

**13. FOUNDATION**

The reservoir foundation shall consist of a concrete ring wall footing and a layer of compacted sand/oiled sand.

**14. COATING SYSTEM**

Coating System Product Data Sheets and MSDS.

Product data information with manufacturer's application instructions for tank coating system shall be submitted.

Coating System is based on a particular type of water stored in each of the reservoirs i.e. potable water, recycled water, wastewater, demineralized water, etc.

Coating System is determined during the design and engineering of the tank.

UIG can offer a vast variety of coating systems specifically designed for your project.

Design criteria of the coating system for coating and recoating of the inside and outside surfaces of steel tanks used for potable water storage in water supply service is based on AWWA D 102-03 std requirements (Coating of Steel Water-Storage Tanks) and NSF 61.

**15. NOTE:**

Welded steel reservoir shall be shop fabricated, erected, inspected, and tested in accordance

with the requirements of AWWA D 100-11.

**16. TESTING**

**A.** Full penetration/groove field welds shall be tested in accordance with the radiographic or ultrasonic method, whichever is applicable and available.

**B.** Reservoir leak testing/hydro-testing should be performed prior to painting.

Leaks shall be repaired and rested until no leaks are found.

After testing, test water shall be disposed.

**C.** A written report shall be submitted of weld inspections in accordance with

Section 11.2 of AWWA DI00-11.

**D.** Tank bottom shall be vacuum box tested for leaks in accordance with Section 11.10.1.2 of AWWA D 100-11.

**E.** Examination of Shell-Io-Bottom Welds shall be performedby one of the following methods:

* Applying a solvent liquid penetrant to the weld and then applying a developer to the gap between the shell and the bottom and examining for leaks after a minimum dwell time of one hour.
* Applying a water-soluble liquid penetrant to either side of the joint and then applying a developer to the other side of the joint and examining for leaks after a minimum dwell time of one hour.
* Applying a high flash-point penetrating oil such as light diesel to the gap between the shell and the bottom, letting stand for at least four hours, and examining the weld for evidence of wicking.
1. Examination and Testing of the Roof

 Fillet welds shall be inspected by the visual method.

 The final weld shall be cleaned of slag and other deposits prior to inspection

1. If Alternative Design per Section 14 is used for the design of the tank, all inspections, welding qualifications, material tests, certifications, etc. required by Section 14 shall be provided.

**PART 7. DISINFECTION**

7.01 STANDARDS

A. The tank structure shall be disinfected at the time of testing in accordance

with AWWA Standard C652- using chlorination method number two. Disinfection shall be performed by a competent water treatment contractor.

A. The tank manufacturer shall include a warranty on tank materials and

workmanship for a specified period. As a minimum, the warranty shall provide

assurance against defects in material, coatings and workmanship for a period

of one (1) year.

**END OF SECTION**