

## **POTABLE WATER STORAGE TANK SPECIFICATION**

### **WELDED STEEL CONSTRUCTION**

#### **PART 1. GENERAL**

##### **1.01 SECTION INCLUDES**

This section includes furnishing and erecting a \_\_\_\_\_ gallon welded steel reservoir and necessary piping and appurtenances, per AWWA D100 specifications, latest revision.

##### **1.02 QUALIFICATIONS OF TANK SUPPLIER**

- A. The Engineer's selection of a welded steel tank is predicated on a thorough examination of design criteria, construction methods, and optimum coating for resistance to internal and external tank corrosion. Deviations from the specified design, construction or coating details will not be permitted.
- B. The bidder shall offer a new tank reservoir as supplied from a manufacturer specializing in the design, fabrication and erection of welded water storage tanks.
- C. The tank shown on the contract drawings and specified herein shall be fabricated by Tank Connection, ATEC Steel or approved equal.
- D. Erection of the tank is to be by the tank manufacturer or approved contractor. The installer shall be fully responsible for the entire installation including tank erection, and the ultimate water tightness of the complete installation.
- E. Strict adherence to the standards of design, fabrication, erection, product, quality, and long-term performance, established in this Specification will be required by the Owner and Engineer.
- F. Tank suppliers wishing to pre-qualify shall submit the following to the Engineer/Owner for consideration:
  - 1. List of tank materials, appurtenances and tank coating technical specifications.
  - 2. Resume of job installation superintendent.
  - 3. The contractor shall have the experience and knowledge necessary to furnish and erect the highest quality tank possible. Under no circumstances shall an inexperienced contractor be awarded the

project. The contractor shall be fully responsible for the entire installation including appurtenances and the final product.

4. The components of the tank that come in contact with stored water shall be certified to meet ANSI/NSF Additives Standard No. 61.

### 1.03 SUBMITTAL DRAWINGS AND SPECIFICATIONS

- A. Construction shall be governed by the Owner's drawings and specifications showing general dimensions and construction details. There shall be no deviation from the drawings and specifications, except upon written order from the Engineer.
- B. The bidder is required to furnish, for the approval of the Engineer and at no increase in contract price, 5 sets of complete specifications and construction drawings for all work not shown in complete detail on the bidding drawings. A complete set of structural calculations shall be provided for the tank structure and foundation.
- C. When approved, two sets of such prints and submittal information will be returned to the bidder marked "APPROVED FOR CONSTRUCTION" and these drawings will then govern the work detailed thereon. The approval by the Engineer of the tank supplier's drawings shall be an approval relating only to their general conformity with the bidding drawings and specifications and shall not guarantee detail dimensions and quantities, which remains the bidder's responsibility.

## **PART 2. DESIGN CRITERIA**

### 2.01 TANK SIZE

- A. The welded tank shall have a nominal diameter of \_\_\_\_\_ ft. with a nominal sidewall height (to roof eave) of \_\_\_\_\_ ft.

### 2.02 TANK CAPACITY AND ELEVATION

- A. Tank working capacity shall be \_\_\_\_\_ gallons (nominal).
- B. Freeboard space in top of tank shall be a minimum of \_\_\_\_\_ ft.
- C. Tank base elevation shall be at \_\_\_\_\_ ft.

## 2.03 TANK DESIGN REQUIREMENTS

- A. The materials, design, fabrication and erection of the welded tank shall conform to AWWA Standard D100, latest edition.
- B. The welded steel reservoir will rest on an oiled sand base contained by a concrete ring-wall foundation.
- C. The reservoir shall be furnished with piping and appurtenances as shown on the plans and as follows:
  - 1. Inlet pipe
  - 2. Overflow pipe
  - 3. Outlet pipe
  - 4. Drain pipe
  - 5. 30" square, hinged, lockable roof hatch
  - 6. Two shell manholes with hinged covers
  - 7. Outside ladder with ladder gate and lock, without fall protection
  - 8. Inside ladder without fall protection
  - 9. Screened roof vent
  - 10. Level indicator
  - 11. Identification name plate

## **PART 3. MATERIALS**

### 3.01 MANUFACTURERS

- A. All materials shall be certified as American Made.

### 3.02 TANK MATERIALS

- A. Furnish steel plate and structural shapes per AWWA D100, Section 2.
- B. Steel pipe and pipe fittings shall conform to ASTM A-120.
- C. Structural bolts shall conform to ASTM A-307.
- D. Welding electrodes shall conform to ASTM 233 E60 or E70.
- F. Asphalt board or asphalt expansion joint material shall be furnished which complies with ASTM D-994.
- G. Caulking mastic shall be 100% solids epoxy or approved equal.

## **PART 4. COATINGS**

### **4.01 INTERIOR COATING SYSTEM**

- A. All coatings that are in contact with potable water must be certified and on the current approved list of the National Sanitation Foundation to meet ANSI/NSF Additives Standard No. 61.
- B. Interior coating system, including coating manufacturer brand name and average DFT (dry film thickness/mils) to be as specified in bid documents.

### **4.02 EXTERIOR COATING SYSTEM**

- A. Exterior coating system, including coating manufacturer brand name and average DFT (dry film thickness/mils) to be as specified in bid documents.

## **PART 5. FABRICATION**

### **5.01 TANK FABRICATION**

- A. All reservoir sub-assemblies and accessories, including shell manholes, ladders, and overflow pipes, shall be fabricated in accordance with AWWA D-100, Section 7.
- B. All exterior ladders, guard rails, brackets, hatch covers, pins and fasteners shall be steel that is hot dipped galvanized per ASTM A123/153 after fabrication.
- C. Welded steel deck assembly per AWWA D100.
- D. Alternative clear-span aluminum dome deck assembly
  1. The roof shall be constructed of non-corrugated triangular aluminum panels. Panels are sealed and firmly clamped in an interlocking manner to a fully triangulated aluminum space truss system of wide flange extrusions, thus forming a dome structure.
  2. The dome shall be clear span and designed to be self-supporting from the periphery structure with primary horizontal thrust contained by an integral tension ring. The dome dead weight shall not exceed 3 pounds per square foot of surface area.
  3. The dome and tank shall be designed to act as an integral unit. The tank shall be designed to support an aluminum dome roof including all specified live loads.

#### 4. Materials

- a. Triangulated space truss: 6061-T6 aluminum struts and gussets.
- b. Triangulated closure panels: .050"t 3003-H16 aluminum sheet.
- c. Tension ring: 6061-T6 aluminum.
- d. Fasteners: 7075-T73 anodized aluminum or series 300 stainless steel.
- e. Sealants and gaskets: gunnable silicone and neoprene rubber.
- f. Dormers, doors, vents and hatches: 6061-T6, 5086-H34 or 3003-H16 aluminum.

### 5.02 APPURTENANCES

#### A. Pipe Connections

1. Overflow piping shall be \_\_\_\_\_ inches nominal diameter schedule 10 carbon steel coated externally or schedule 40 PVC. A 90 degree internal weir elbow with external downcomer pipe and flap valve shall be provided for the overflow.
2. Inlet and outlet connections shall conform to the sizes and locations specified on the plan sheets.

#### A. Outside Tank Ladders

1. An outside tank ladder shall be furnished and installed as shown on the contract drawings.
2. Safety cage and step-off platforms shall be fabricated of galvanized steel. Ladders shall be equipped with a hinged lockable entry device.

#### B. Access Doors

1. Two manways shall be provided as shown on the contract drawings in accordance with AWWA D100.
2. The manhole opening shall be a minimum of 24 inches in diameter. The access door (shell manhole) and the tank shell reinforcing shall comply with AWWA D100.

### C. Roof Vent

1. A properly sized vent assembly in accordance with AWWA D100 shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum design rate of water fill or withdrawal, the resulting interior design pressure / vacuum will not exceed +2.0 / -0.5 ounces per square inch.
2. The overflow pipe shall not be considered to be a tank vent.
3. The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including a 4 mesh (1/4" opening size) galvanized screen. If required by the contract drawings, a 16 mesh (1/16" opening size) galvanized screen will be installed to prevent the entrance of insects. However, if the tank is located in an area where heavy frost is common during the winter months an additional pressure / vacuum relief valve must also be provided.

### E. Roof Hatch

1. The manufacturer shall furnish a roof opening which shall be placed near the outside tank ladder and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least thirty (30) inches square. The opening shall have a curb, at least four (4) inches in height and the cover shall have a downward overlap of at least two (2) inches.

### F. Roof Perimeter Guardrail

1. Perimeter guardrail and toeboard around the perimeter of the deck shall be provided and installed as specified on the project drawings.

### G. Liquid Level Indicator

1. A liquid level indicator with stainless steel float, number board and high visibility target shall be provided and installed as detailed on the project drawings.

### H. Identification Plate

1. Manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity. The nameplate shall be affixed to the tank exterior sidewall location approximately five (5) feet from the grade elevation.

## **PART 6. EXECUTION**

### **6.01 EARTHWORK**

A. All excavation, structural fill, and structural backfill in connection with foundation preparation and construction shall be done according to the requirements of the drawings and of contract documents. All trench excavation, pipe laying, and pipe bedding and backfill shall be done according to the requirements of the drawings and specifications.

### **6.02 CONCRETE**

A. All concrete work for reservoir foundations and floor slabs shall be done according to contract documents.

### **6.03 FIELD EXAMINATION**

A. The tank fabricator shall field verify the foundation elevation and the tolerances of the in-place foundation. Any deviations shall be reported to the Engineer for correction before proceeding with any work. All tank piping must be in place prior to the commencement of tank erection.

### **6.04 TANK ERECTION**

A. The CONTRACTOR shall furnish all labor, tools, scaffolding, and other equipment necessary to properly erect the tank complete and ready for use.

B. Erection shall be completed in compliance with Section 10 of AWWA D100 for welded steel tanks.

### **6.05 FIELD QUALITY CONTROL TESTING**

A. After the erection of the reservoir is completed and before it is painted, it shall be tested for leaks. Any leaks that are disclosed in the shell bottom, roof, manhole, or piping shall be repaired prior to painting.

B. Inspection and testing shall be in accordance with Section 11 of AWWA D100, latest revision.

C. All defective welds shall be removed and repaired in accordance with Section 11 of AWWA D100, latest revision.

D. Make available all radiographs and other testing information to the Owner's representative during construction.

E. After completion of the work, the Contractor shall submit a written report and certification that all work has been inspected and tested and is in accordance with all applicable provisions of AWWA D100, latest revision.

F. All costs associated with testing shall be paid by the Contractor.

## **PART 7. DISINFECTION**

### **7.01 STANDARDS**

A. The tank structure shall be disinfected at the time of testing in accordance with AWWA Standard C652-02 "Disinfection of Water Storage Facilities" using chlorination method number two. Disinfection shall be performed by a competent water treatment contractor.

## **PART 8. TANK MANUFACTURER'S WARRANTY**

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 \*\***

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