

## **SECTION 22 13 00**

### **HOUSE/BREAK TANKS**

#### **PART 1 - GENERAL**

##### 1.1 RELATED DOCUMENTS:

- A. The Conditions of the Contract and applicable requirements of Division 1, "General Requirements", and Section 23 01 00, "Mechanical General Provisions", govern this Section.

##### 1.2 DESCRIPTION OF WORK:

- A. Work Included: Provide house/break tanks as specified and indicated.
- B. Work of Other Sections: Electrical connections for high and low level alarms are specified in Division 16.

##### 1.3 QUALITY ASSURANCE:

- A. The tank fabricator shall have had no less than 10 years experience building 3,500 gallon or larger potable water and fire protection water tanks for commercial construction and shall have previously constructed a minimum of 20 tanks of 3,500 gallons or larger. A list of installations of such tanks shall be furnished if required by the Engineer. The tank shall be constructed entirely of new material.
- B. Level alarm shall be UNIPOINT electrode system with control panel or an approved equal.
- C. Float operated valves shall be Cla-Val or an approved equal.

##### 1.4 SUBMITTALS:

- A. Shop Drawing submittals shall include, but not be limited to, the following:
  - 1. Drawings to scale of all tank components indicating dimensions and locations of all pipe connections, ladders, manholes and stilling wells
  - 2. Certification of the design by a registered structural engineer
  - 3. Coating material specifications and product literature
  - 4. Accessory cut sheets showing all features, options and control diagrams.
  - 5. List of installations and year of placement into service
  - 6. Additional items as required in Section 23 01 00.

##### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING:

- A. Deliver tanks, trim and accessories to the jobsite in a timely manner, coordinated with construction of the enclosing tank room. Cap, plug, cover and protect all tank openings.
- B. Handle tanks, trim and accessories carefully to avoid damage to material, component, enclosure and finish.
- C. Store tanks, trim and accessories in a clean dry space and protect from weather.

#### **PART 2 - PRODUCTS**

##### 2.1 TANKS:

- A. General: Tank size and configuration shall be as shown on Drawings. Construction shall be in accordance with American Welding Society Specifications with steel plate and reinforcing as follows:
  - 1. 1/4" plate minimum for top.
  - 2. 1/4" plate minimum for shell sides, **divider**, and bottom.
  - 3. Four inch by 5.4 pound minimum channel reinforcing on top and six inch by 8.2 pound minimum channel reinforcing on sides.
  - 4. Flanged and threaded openings with vortex plates as shown on Drawings and required.
  - 5. Stainless Steel ladders inside and outside.
  - 6. 24" x 24" manholes with gasket cover in top and side of each compartment.

7. Perforated stilling wells for electrodes and float valves.
8. Split flange float access covers with neoprene rubber boots.
9. Tank vent with stainless steel vermin screen.
10. Tank overflow to sump with stainless steel vermin screen.
11. Valved drain connection(s) to sump.
12. Provisions for level alarm switches.
13. Lifting Lugs.
14. Nameplate.
15. Fire pump test connection, when required, with standpipe extending into the two tank two feet below the operating water level and with a baffle as detailed on the plans.
16. Water level gauge consisting of two one half inch angle valves with ball checks and ¼" needle drain valves, with 5/8" rigid plastic sight glass on each tank or compartment. The rigid plastic sight glass to be run inside continuous baked urethane coated Unitrust to provide physical protection.

B. Capacity: Tank capacities shall be as indicated on the Drawings plus 12" free space above the highest water level.

C. Water Tank Protective Coating:

1. Surface Preparation: In accordance with SSPC-SP10(63) near white blast clean with 2.0 to 3.0 mil surface profile.
2. Application: Conform to standards of Steel Structures Painting Manual, Volume 1, Good painting Practice.
3. Interior Surfaces: One coat AMERLOCK 400 High SolidS Epoxy (buff) 4-6 mils and one coat AMERLOCK 400 (white). Final D.F.T. of 8-16 mils, and listed in ANSI/NSF Standard 61.
4. Exterior Surfaces: One coat of AEGEON 1112 VOC Phenolic Modified Red Iron Oxide Inhibitive Primer 1.5 to 3.0 mils D.F.T. on shell of tank[s]; two coats AEGEON 1400 Quick Dry Coal Tar Coating, 16-20 mils D.F.T. on top and bottom of tank[s].

D. Nameplate: A metal nameplate giving the name of fabricator, date of fabrication and serial number shall be permanently affixed to the tank.

## 2.2 ACCESSORIES:

A. Solenoid Control Valve: Provide a 120 volt solenoid control valve on the city side of the surge tank fill valves as shown on the drawings. The valve shall be normally open and controlled by the high level alarm inside the surge tank. Closing of the control valve on fire water tanks shall signal the fire alarm system indicating that water flow has ceased to the fire system. Solenoid valves shall be Cla-Val Model No. 136G-03AB or an approved equal

B. Float Valves For Each Water Compartment: Provide fill valves for each tank of the quantity and size shown on the drawings. Fill valves shall be Cla-Val No. 124G-01A or an approved equal, pilot operated diaphragm type float valves with brass float rods. Fill valve floats shall be furnished with suitable stilling wells. Valves shall have a brass housing with stainless steel and monel working parts, steel bracket and counterweight with non-corroding plastic float. Valves shall be hydraulically operated, diaphragm-actuated, globe pattern valves and shall contain a resilient, synthetic rubber disc, having a rectangular cross section, contained on 3-1/2 sides by a disc retainer and forming a tight seal against a single removable seat insert. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing valve from the line. Valve shall open wide when float is at low liquid level and close driptight when float is at high liquid level. Settings shall be adjustable.

C. Unipoint Level Alarm System:

1. Level Alarm Signal Requirements: Provide electrode level alarm sensors with electrode fitting and level signal panel with all control relays, terminals, level sensing equipment, alarms, and all other apparatus and accessories specified or necessary for complete signal system. System to be the unit responsibility of one supplier.
  2. Provide the following and such other items as detailed on the drawings:
    - a. Electrode Fitting & Electrodes: Warrick Wire suspended electrode fitting[s], 3" flanged, series 3G for each tank or tank compartment- total of [ ] fitting[s].
    - b. Warrick type 3Z1A electrode suspensions wire as required with type 3W2SS wire suspended electrodes. One set of electrodes is required for each tank or tank compartment – total of [ ] set[s]. Provide arrangement of electrodes from top of tank as follows.
      - 1) High Level Alarm [and signal for block valve closure]
      - 2) High level reference.
      - 3) Low water alarm [and pump cut-off for domestic pump only].
      - 4) Low level reference [and provide a low level alarm output for monitoring by ]].
- D. Level Alarm Panel:
- 1) UNIPOINT alarm control panel, NEMA 4X fiberglass enclosure.
  - 2) Amber "Power ON" light.
  - 3) Warrick solid state electronic liquid level relay controls.
  - 4) Common alarm buzzer with silencing pushbutton.
  - 5) High & Low level alarm lights with name plate for each tank or tank compartment – total of [ ] light[s].
  - 6) Auxiliary alarm contacts for remote alarm device.
  - 7) Numbered terminal strip for field connections to electrodes, domestic pump circuit and remote alarm devices.
  - 8) Selector switch to select tank or compartments to be monitored. [ Used where two compartments are provided for domestic and/or fire protection water].

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION:**

- A. General: Pipe and install tanks as shown on the drawings and per the tank manufacturer's written installation recommendations.
- B. Housekeeping Pads: Install tanks on housekeeping pads as specified in Section 23 03 00. Bottom of tank shall be set in 1/8" thick coat of mastic covering the tank equipment pad.
- C. Painting: After installation, seal all exterior openings on the tanks, apply another coat of an approved zinc chromate primer and two coats of epoxy enamel.
- D. Startup: Thoroughly clean the inside of the tank and verify that all manhole doors and gaskets, vermin screens and float valve boots are installed before filling the tank.
- E. Alarms: Install tank alarm panels for wiring by Division 26.
- F. Testing: Test tank to verify proper operation of fill valves, high and low level switches, control interlocks and alarm annunciation.

**END OF SECTION 22 13 00**