SECTION 23 53 16 – FEEDWATER TANK

FEEDWATER TANK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Feedwater Tank
   2. Feedwater Tank Trim

1.2 REFERENCES

A. National Electrical Manufacturers Association (NEMA)
   1. NEMA 250 - Enclosures for Electrical Equipment

1.3 SUBMITTALS

A. Submittals shall include:
   1. Product Data: Full product description including all accessories and control settings.
   2. Drawings: Submit general arrangement drawing; including dimensions, weights and ratings, wiring diagrams, and all other shop related drawings.
   3. Include materials of construction of major pressure vessel parts and fittings.
   4. Controls Cutsheet: Submit complete set of cutsheets for trims and controls.
   5. Rigging instruction: Submit detailed instructions on manufacturers recommended lifting and unloading procedures.

6. Warranty: Submit standard form equipment warranty.

B. Closeout Submittals:

1. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, cleaning procedures, recommended spare parts list, and maintenance and repair information.

2. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.

3. Test Reports: Indicate feedwater tank meets or exceed specified performance and efficiency.

1.4 QUALITY ASSURANCE

A. The packaged feedwater tank must receive factory tests to check the construction, controls, and operation of the unit.

B. Allow witnessing of factory inspections and tests at manufacturer’s test facility

1.5 DELIVERY, STORAGE, AND HANDLING

A. Cover all openings, leave drain valves in open position, wrap electronics in plastic.

B. Off load feedwater tank in accordance with feedwater tank rigging instructions.

1.6 WARRANTY

A. All equipment is to be guaranteed against defects in workmanship and materials for a period of 12 months from date the equipment is first placed in use, or 18 months from date of completion; whichever shall be less.

PART 2 – PRODUCTS

2.1 FEEDWATER TANK

A. Manufacturers:
   1. Superior Boiler Works
   2. Cleaver Brooks
   3. BFS Industries
   4. U.S. Deaerator
   5. Industrial Steam

B. Type: The Feedwater tank shall be of atmospheric design and be able to accept all condensate returns from the entire steam system including gravity returns, pumped returns, and high pressure returns from steam traps if necessary. All returns to the feedwater tank shall be identified and discussed with the manufacturer to accommodate the system.
   1. The unit shall be a _____ (simplex or duplex or triplex) package boiler feedwater system suitable for a _____ HP boiler operating at _____ PSI when pumping 1900 water.

C. Construction:
   1. Shell: Provide horizontal steel receiver of _____ gallon capacity constructed of heavy gauge steel.
      a. (30-100 Gallons) Shell shall be made of ¼" thick ASTM A500.
      b. (200-1000 Gallons) Shell shall be made of ¼" thick ASTM SA516-70.
   2. Support: Steel saddles or legs welded to storage tank with minimum height to provide for the net positive suction head required of the pumps selected. Coordinate location with structural design of building.
   3. Connections:

a. Provide connections for condensate return, atmospheric vent, drain, overflow, gauge glass and fresh water make up.
b. Provide connection for magnesium anode.
c. Provide feedwater outlet.
d. Provide ½" connection for aquastat.
e. Provide ½" connection for thermometer.
f. (optional) Provide 2" connection for preheater piping.
g. (optional) Provide 1 ½" connection for chemical feed.

4. Rigging and Jacking: The feedwater tank is to be equipped with (S1-S5) one lifting eye, (S6-S8) two lifting eyes, located on the top center line. Provisions for jacking. Jacking locations shall be clearly marked.
5. (Optional) Manway: Feedwater tank shall have a 16" circular manway in storage tank, located below the normal water level, but near the tank centerline, and away from internal piping. Manway location must allow unrestricted access to tank interior with no interference from internal equipment and piping and with easy access from outside the tank.

D. Finish: The entire feedwater tank is to be painted with a high temperature, 400 degrees Fahrenheit minimum, silicone-based enamel.

2.2 FEEDWATER TANK TRIM (ACCESSORIES)

A. The feedwater tank is to be fully trimmed by the manufacturer including the following:
1. Lifting eye(s).
2. Pump suction piping with isolation valve, strainer, and flexible connector.
3. Tank Overflow Drain: Sized to relieve full capacity at operating pressure.
4. Makeup Water: Provide internal fresh water make up valve, bronze heavy-duty type with brass rod.

5. Provide water gauge glass with shut off cocks.
6. Alarms: High-water-level alarm switch, low-water-level alarm switch, low water cut-off and one alarm bell with silence switch.
7. Provide a magnesium sacrificial anode.
8. Vent: connection for vent shall be on top centerline of the receiver.
9. (optional) Provide chemical diffuser with gate valve and check valve.
10. (optional) Provide thermometer mounted in tank, with a range of 40-280 F.
11. (optional) Provide aquastat.
12. (optional) Provide perforated steam pipe heater with aquastat, solenoid valve and strainer.

B. Pump(s): Two or more stages, centrifugal diffuser type, direct-coupled, vertical shaft, in-line, base-mounted, motor-driven.
   1. A total of ___ transfer pumps shall be furnished. Pump to be electric motor driven and to have a capacity of _____ gpm with a discharge pressure of _____ psig.
   2. Motors shall be non-overloading type of sufficient horsepower, drip proof, suitable for operation on 3 phase, 60 cycle, _____ volts, AC. Sealing and/or cooling water shall be provided in accordance with pump manufacturer's recommendations.
   3. Pump size shall be based on pump schedule.

C. Control Panel:
   1. NEMA 250, Type 1 enclosure.
   2. Shall have visual indication of status and alarm with momentary test push button.
   3. Shall have audible alarm and silence switch.
   4. Removable control mounting plate.

END OF SECTION