SECTION 15710 – HEAT EXCHANGERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK INCLUDED

A. Furnish and install all heat exchangers to make a complete and operations system.

B. All system components shall be installed in accordance with local code including supports and bases.

C. Secure all permits and local/State approval for the installation of all components included under this Section.

D. Provide factory assembled and tested shell and tube or plate-and-frame heat exchangers with plate quantity, capacity, temperature range, physical dimensions and other characteristics, as scheduled on the drawings and as hereinafter specified.

E. Provide piping, valves, controls, fittings and accessories as required and shown on the drawings.

1.3 RELATED SECTIONS

A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.4 REFERENCES

A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.

B. Material standards shall be as specified or detailed hereinafter and as follows:

1. ASME (BPV VIII, 1) – Boiler and Pressure Vessel Code, Section VIII, Division 1 – Rules for Construction of Pressure Vessels; 1995.

1.5 SUBMITTALS

A. See Section 15050 and General Conditions for additional requirements.

B. Product Data: Provide date with dimensions, locations and size of tappings and performance date.

C. Shop Drawings: Indicate dimensions, locations and size of tappings and performance data.

1. Design Data: Indicate in sufficient detail to verify that heat exchangers meet or exceed specified requirements.
2. Test Reports: Indicate pressure tests.

D. Manufacturer's Instructions: Indicate installation and support requirements.

E. Operation and Maintenance Data: Include start up and shut down instructions, assembly drawings and spare parts list.

1.6 REGULATORY REQUIREMENTS

A. Conform to ASME (BPV VIII, 1) – Boilers and Pressure Vessels Code for manufacture of tubular heat exchangers and heat exchanger shells and plate and frame type heat exchangers.

B. Conform to ASME Code Form #U-1 for unfired pressure vessels.

1.7 DELIVERY, STORAGE AND HANDLING

A. Protect internals from entry of foreign material by temporary caps on flanged openings.

PART 2 - PRODUCTS

2.1 STEAM-TO-HOT WATER SHELL-AND-TUBE HEAT EXCHANGERS (CONVERTERS)

A. Acceptable Manufactures contingent on compliance with the specification:

1. Bell & Gossett
2. Armstrong
3. Amtrol
4. Patterson Kelly

B. Provide steam-to-hot water shell-and-tube heat exchangers in accordance with the capacities, piping and valving arrangements indicated, as scheduled on the drawings, and as hereinafter specified.

C. Heat exchangers shall be installed where shown on the plans, complete with all necessary appurtenances, base supports, and adjustable saddles. Quantity capacity, physical dimensions and other characteristics shall be as scheduled on the plans.

D. Heat exchangers shall be constructed with cast iron heads, steel shell baffles, and steel or cast iron removable tube sheets for heating hot water, copper tie rods, and steel nuts and bolts.

E. Heating surface shall be 3/4" o.d. copper tubing securely expanded to one end of the tube sheets and properly supported at the other end. The copper tubing shall have a minimum thickness of 0.035".

F. Heat exchangers shall be complete with all necessary outlets for steam supply and return, water inlet and outlet, drain and vent connections, vacuum breaker, cleanout handholes, and tappings for temperature and pressure gauges.

G. Fouling factors for both tube and shell shall be minimum 0.002 or as scheduled. Tube velocity shall not exceed 7.0 fps.

H. Heat exchangers shall be designed so as to prevent entering steam from impinging directly on the tubes, shall be tested at the factory under a hydrostatic pressure of 300 psig, conform to ASME Codes for pressure vessels, and shall bear an ASME stamp for 125 psig working pressure, with certificate issued.

I. Steam-to-hot water heat exchangers shall have steam in the shell and water in the tubes. Shop drawings shall be submitted for heat exchangers with all dimensions, capacities, materials of construction and nozzle arrangements shown. Fabrication shall not commence until shop drawings have been approved.

J. Provide saddle supports per heat exchanger.

PART 3 - EXECUTION

3.1 STEAM-TO-HOT WATER SHELL-AND-TUBE HEAT EXCHANGERS (CONVERTERS) INSTALLATION

A. Steam-to-hot water shell-and-tube heat exchangers shall be installed in accordance with manufacturer's recommendations, Contract Drawings, and reviewed submittals.

B. The heat exchanger shall be installed such that the shell shall pitch down toward the bottom condensate drain opening.

C. The heat exchanger shall be installed such that there shall be sufficient clearance equal to the tube length to remove the heads and clean or eddy current test the tubes.

3.2 START UP SERVICE

A. Provide start-up service by a factory approved and certified technician.

END OF SECTION