

SECTION 235250 – WOOD BOILER SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. The owner has purchased a wood boiler system from Biomass Systems Supply, Chico, California. The contact person for the boiler system is:

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- B. The boiler is expected to be delivered to Craig, Alaska by March, 2023. The owner will coordinate receipt of and storage of the equipment when it arrives in Craig. The contractor shall coordinate with the owner delivery of the boiler system to the project site when the project begins. The owner will deliver the boiler system to the project site.
- C. The contractor shall install all the boiler system equipment and components per the manufacturer's installation instructions to provide a complete and operational system. Information on the boiler equipment and components are located in layout drawings included in the construction documents.
- D. Biomass Systems Supply will be on site two times during construction to coordinate assembly of the boiler system components. The first site visit will be to coordinate the installation of the imbeds for the walking floor scraper system and coordinate assembly of the boiler system components. The second site visit will be to perform system start up and operation testing and provide owner training of the system. The contractor shall coordinate and schedule the site visits with Biomass Systems at least 3 weeks in advance of the work being performed.
- E. The boiler system includes a packaged, factory-fabricated and assembled boiler, trim, and accessories for generating hot water from burning wood chips. Boiler includes heat exchanger and burner tube.
- F. The boiler system includes factory-fabricated walking floor scraper system, collection augers, lift auger, metering bin and stoker auger.

1.2 WARRANTY

- A. TwinHeat A/S will provide the equipment warranty and Biomass Systems will coordinate any warranty items.
- B. The contractor shall warranty any components provided by the contractor as part of the assembly.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Twin Heat furnished by Biomass Systems Supply, Chico, CA

2.2 BOILER

- A. Description: Factory-fabricated, assembled, and tested, steel flame-tube boilers with heat exchanger sealed pressure tight, built on a steel base plate; including insulated jacket, flue-gas vent, water supply and return connections, and controls.
 - 1. Twin Heat Boiler System Model CS 150i
- B. Burner: Welded steel construction, with primary air plate ports and bottom screw conveyor feed for wood chip fuel. Mounted to back of boiler, fastened with lugs and nuts.
- C. Combustion Blower: Variable speed centrifugal fan integral to burner, directly driven by motor, with fixed primary, secondary air ratio plenum.
- D. Fuel Supply: Direct mounted gear motor and auger, with modulated, on-off control sequence. Fed through air-tight fire valve.
- E. Flue Gas Fan: Variable speed centrifugal fan integral to smoke box, directly driven motor, controlled via PID, using feedback from manometer.
- F. Water cooled burner tube pump, pressure switch, and accessories.
- G. Emergency burner tube cooling back up connection with connection to domestic water.
- H. Stoker sprinkler head for burn back prevention.
- I. RTD Controllers.
- J. Operating controls.
 - 1. Electric factory-installed panel to control burner firing rate to maintain boiler set temperature.
- K. Drain Valve: 1/2-inch diameter.
- L. 150 Liter atmospheric expansion tank.

- M. Shunt 3-way boiler protection valve and valve controller.
- N. Brazed plate heat exchanger for use between open boiler system and glycol loop to school.
- O. Smoke box pipe and insulation.
- P. All fuel stack with support stand.

2.3 ASH HANDLING

- A. Flame Tube Cleaning Mechanism: Compressed air nozzles.
- B. Burner Plate Cleaning Mechanism: Steel burner scraper plate oscillated with steel rod eccentrically driven with dedicated motor, ash removal system controlled.
- C. Ash Screw-Auger:
 - 1. Screw-auger and hardened steel ash wiper direct drive with shaded pole motor.
 - 2. Controlled by ash removal system logic.
- D. Ash Bin: Detachable external compressed ash storage, fed by screw conveyor.

2.4 WOOD HANDLING EQUIPMENT

- A. Hydraulic walking floor scraper system. Components shall be heavy duty to accommodate 15 feet of wood chips on top.
- B. Collection Auger. To lift wood chips to metering bin.
- C. Air-tight rotary air lock between burner and metering bin.
- D. Water connection on stoker auger with supply solenoid that opens when burn back is detected and floods the stoker auger.

2.5 ELECTRICAL POWER

- A. Field Power Available to boiler: 208 VAC, 3 Phase, 16 Amps.
- B. Power connections at boiler and at hydraulic floor system. Each power connection is 380 VAC, 3 Phase.
- C. A step up transformer is provided to provide 380 VAC to the boiler and hydraulic floor system.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before boiler installation examine locations, and piping and electrical connections to verify actual locations, sizes, and other conditions affecting boiler performance, maintenance, and operations.
- B. Determine exact locations before roughing-in for piping and electrical connections.
- C. Install boilers on a flat level base on a non-combustible floor or shielding. The floor must comply with NFPA 31.
- D. Examine mechanical spaces for suitable conditions where boilers will be installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
- F. Before wood fuel handling delivery system installation, examine boiler and storage location to verify actual lengths, locations, and orientations affecting connection of the wood chip delivery system.

3.2 BOILER INSTALLATION

- A. Consult all provided installation manuals and factory training programs prior to installation.
- B. Install boilers according to NFPA 31.
- C. Assemble and install boiler trim.
- D. Install electrical devices furnished with the boiler but not specified to be factory mounted.

3.3 WOOD CHIP DELIVERY SYSTEM INSTALLATION AND ASSEMBLY

- A. Consult all installation manuals and factory training prior to install.

3.4 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Allow for removable boiler casing do not attach non-removable connections to the sheet metal boiler jacket.
- C. Install piping adjacent to boiler to allow service and maintenance.
- D. Connect wood chip delivery system to burner.
- E. Connect hot-water piping to supply and return boiler tappings with shutoff valve and union and flange at each connection.
- F. Connect boiler flue gas to chimney.
- G. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

H. Install piping adjacent to machine to allow service and maintenance.

I. Ground equipment according to Division 26.

J. Connect wiring according to Division 26.

3.2 DEMONSTRATION

A. Biomass Systems Supply will provide a factory trained technician to train Owner's maintenance personnel to adjust, operate, and maintain boilers and fuel handling system.

END OF SECTION 235250