



Sheldon High School Boiler Replacement
CIP No. 410.652.349
Eugene School District 4J
Eugene, Oregon

ADDENDUM NUMBER ONE

May 17, 2019

This addendum is issued to clarify, change, and correct the Request for Bids Documents and shall form part of the contract. Acknowledge receipt of this addendum in the space provided on the bid form. Failure to do so may subject bidder to disqualification.

Replace Section 23-52-34 Condensing Boilers with the following pages.

**SECTION 23 52 34
CONDENSING BOILERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Gas-fired Condensing Hot Water Boilers

1.02 RELATED SECTIONS

- A. Section 23 51 00 - Combustion Air and Vent Systems: Category IV steel vent system.
- B. Section 23 21 14 - Hydronic Specialties.
- C. Section 26 00 00 - Basic Electrical Requirements (For Reference Only)

1.03 REFERENCES

- A. AHRI boiler efficiency certification
- B. ASME SEC IV - Boiler and Pressure Vessel Codes - Rules for Construction of Heating Boilers.
- C. NFPA 54 (AGA Z223.1) - National Fuel Gas Code.
- D. ANSI Z21.13 - Gas Fired Low Pressure Boilers
- E. ASME CSD-1 - Controls and Safety Devices
- F. UL or CSA Standards for Gas Fired Boilers

1.04 SUBMITTALS FOR REVIEW

- A. Section 01300 - Submittals: Procedures for submittals.
- B. Product Data: Provide data indicating general assembly, components, controls, safety controls, and wiring diagrams with electrical characteristics and connection requirements.
- C. Submit manufacturer's installation instructions. Indicate assembly, support details, connection requirements, and include start-up instructions.
- D. Manufacturer's Field Reports: Indicate condition of equipment after start-up including control settings and performance chart of control system.
- E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, cleaning procedures, replacement parts list, and maintenance and repair data.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for internal wiring of factory wired equipment.
- B. Conform to ASME SEC IV for boiler construction.
- C. Products Requiring Electrical Connection: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.06 CERTIFICATIONS

- A. Manufacturer's Certification: The boiler manufacturer shall certify the following:
 - 1. The products and systems furnished are in strict compliance with the specifications.
 - 2. The boiler, burner, and other associated mechanical and electrical equipment have been properly coordinated and integrated to provide a complete and operable boiler package.
 - 3. AHRI Certification of efficiency as tested by third party.
 - 4. ASME Certification in the form of ASME Stamp on the product and completed and signed data sheet.
 - 5. ASME CSD-1 Certification, in the form of completed data sheet.
 - 6. CSA or UL Certification in the form of an affixed label to the equipment.
 - 7. The specified factory tests have been satisfactorily performed.
 - 8. The specified field tests have been satisfactorily performed.
- B. Operation and Maintenance Manuals: Manufacturer's printed operation and maintenance manuals shall be submitted prior to final acceptance by the engineer. Operation and maintenance manuals shall contain dimension and wiring drawings, product data, operating

instructions, cleaning procedures, replacement parts list, maintenance and repair data, complete parts list, etc.

1.07 STANDARD WARRANTY

- A. Heat exchangers shall be warranted against leakage and thermal shock for 10 years.
- B. All other parts shall be warranted for one year after installation or 18 months after shipping.

1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Section 01600 - Material and Equipment: Transport, handle, store, and protect products.
- B. Protect units during shipping. Owner will inspect for damage after unloading at warehouse.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Lochinvar Crest FB/FBN 5001, or Aerco Benchmark 5000, or Cleaver-Brooks ClearFire-LC 5000.
- B. Substitutions: Under provisions of Section 01600, Product Requirements.

2.02 BOILERS

- A. The boiler shall bear the ASME "H" stamp for 160 psi working pressure and shall be National Board listed. There shall be no banding material, bolts, gaskets or "O" rings in the header construction. The boiler shall have a 316L stainless steel, fire tube heat exchanger. The heat exchanger shall be designed for a single-pass, flow through design and will drain condensation to the bottom of the vessel.
- B. The boiler shall be certified and listed by C.S.A. International under the latest edition of the harmonized ANSI Z21.13 test standard for the U.S. and Canada. The boiler shall comply with the energy efficiency requirements of the latest edition of the ASHRAE 90.1 Standard and the minimum efficiency requirements of the latest edition of the ASHRAE 103 Standard. The boiler shall operate at the scheduled minimum thermal efficiency at full fire as registered with AHRI. Boiler shall operate up to 99% thermal efficiency with return water temperatures at 90°F or below. The boiler shall be certified for indoor installation.
- C. The boiler shall be constructed with a heavy gauge steel jacket assembly, primed and pre-painted on both sides. The combustion chamber shall be sealed and completely enclosed, independent of the outer jacket assembly, so that integrity of the outer jacket does not affect a proper seal. A burner/flame observation port shall be provided. The burner shall be a premix design and constructed of high temperature stainless steel with a woven metal fiber outer covering to provide modulating firing rates. The boiler shall be supplied with a gas valve designed with negative pressure regulation and be equipped with a variable speed blower system, to precisely control the fuel/air mixture to provide modulating boiler firing rates for maximum efficiency. The boiler shall operate in a safe condition at a derated output with gas supply pressures as low as 4 inches of water column. The burner flame shall be ignited by spark ignition with flame monitoring via a flame sensor
- D. The boiler shall utilize a 24 VAC control circuit and components. The control system shall have a Liquid Crystal touch screen display for boiler set-up, boiler status, and boiler diagnostics. All components shall be easily accessed and serviceable from the front of the jacket. The boiler shall be equipped with a temperature/pressure gauge; high limit temperature control with manual reset; ASME certified pressure relief valve set for 100 psi; outlet water temperature sensor; return water temperature sensor; outdoor air sensor, flue temperature sensor; high and low gas pressure switches, low water cut off with manual reset and a condensate trap for the heat exchanger condensate drain.
- E. The boiler shall feature an internal control system with a liquid crystal touch screen display, password security, and PC port connection. The boiler shall have alarm contacts for any failures, runtime contacts and data logging of runtime, ignition attempts and ignition failures. The boiler shall allow 0-10 VDC input connection for BMS control and have built-in "Cascade"

to sequence and rotate while maintaining modulation of up to five boilers without utilization of an external controller. The control may be compatible with optional BACnet communication.

- F. The boiler shall be equipped with two terminal strips for electrical connection. A low voltage connection board with 30 data points for safety and operating controls, i.e., Alarm Contacts, Runtime Contacts, two Flow Switches, Remote Enable/Disable, System Supply Sensor, Outdoor Sensor, Modbus Building Management System signal and Cascade control circuit. A high voltage terminal strip shall be provided for Supply voltage. Supply voltage shall be 120 volt / 60 hertz / single phase.
- G. Condensate trap: External trap, furnished with each boiler, including required connecting tubing and fittings.

2.03 DUAL-FUEL BOILERS (PROPANE AND NATURAL GAS)

- A. Boilers scheduled as dual-fuel shall be by the same manufacturer as single-fuel boilers.
- B. Boilers scheduled as dual-fuel shall be furnished capable of manual switchover from one fuel to the other without requirement of adjustment to burner, blower, or related equipment.
- C. Boiler shall have separate propane and natural gas piping connections, with independent shut off valves.
- D. Boiler control panel shall be utilized, with suitable password, to make the switchover.
- E. Boiler control panel shall include visual indicator of fuel selection.

2.04 CONDENSATE NEUTRALIZATION KIT

- A. Description: Furnished with each boiler, for removing acidity from boiler condensate.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install equipment in strict compliance with manufacturer's installation instructions, which can be obtained on the internet at: <http://www.lochinvar.com>
- B. Install equipment in strict compliance with state and local codes and applicable NFPA standards.
- C. Maintain manufacturer's recommended clearances around sides and over top of equipment.
- D. Install components that were removed from equipment for shipping purposes.
- E. Install components that were furnished loose with equipment for field installation.
- F. Provide all fuel gas vent and service piping.
- G. Provide all piping for boiler pipe connections.
- H. Pipe relief valves as indicated.
- I. Mount to housekeeping pad and seismically secure to pad.

3.02 MANUFACTURER'S FIELD SERVICES

- A. General: The boiler supplier's factory authorized service organization shall be responsible for performance of inspections, start up and testing of the package boilers, and accessory equipment and materials furnished under this Section.
- B. Equipment inspection: Boiler representative shall provide jobsite assistance to inspect boilers and other equipment upon arrival, verifying completeness of equipment supplied and potential damages.
- C. Pre start-up walk through: Boiler representative shall spend 2 hours at jobsite reviewing installation with mechanical contractor to be conducted approximately 1 week prior to startup.
- D. Start-up will be conducted by factory authorized technician and will include:
 - 1. Demonstrate that boiler, burner, controls, and accessories comply with requirements of this Section as proposed by the boiler and accessories supplier. Pre-test all items prior to scheduling the final testing that will be witnessed by the test engineer.

2. Readings at different firing rates (20, 50, 75 and 100%) of load for the modulating burner shall be taken with a written report of the tests submitted to the engineer. The reports shall include readings for each firing rate tested and include stack temperatures, O₂, CO, NO_x, and overall boiler efficiency.
3. Auxiliary Equipment and Accessories: Observe and check all valves, draft fans, electric motors and other accessories and appurtenant equipment during the operational and capacity tests for leakage, malfunctioning, defects, and non compliance with referenced standards or overloading as applicable.
4. Commissioning Requirements:
 - a. Fireside inspection
 - b. Set up fuel train and combustion air system
 - c. Set up operating set points
 - d. Check all safeties, including Flame safeguard, LWCO, Airflow, Fuel pressures, High limits.
 - e. Set up and verify efficiencies at 20%, 50%, 75%, and 100%
 - f. Set up and verify burner turndown.
- E. Coordinate with installing contractor and Owner to ensure completion of installation prior to factory start up procedure.
- F. Correct any deficiencies noted by factory start up technician.

END OF SECTION 23 52 34