City of Lynchburg
Procurement Division
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Lynchburg, Virginia 24504
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Addendum for Invitation for Bids
Criminal Justice Academy Boiler Replacement

13-844

Date: 5/23/2013
From: Lisa Moss, Buyer VCA
RE: Addendum No. 1

This Addendum supplements and amends the original Plans and Specifications and shall be taken into account in preparing proposals and shall become a part of the Contract Documents. The Bidder shall indicate receipt of this Addendum and all previously issued Addenda on the Bid Form.

1. **This addendum replaces previously issued sections:**
   23 5100 Breechings, Chimneys and stacks.
   23 5216 Condensing Boilers
   The revisions are as provided by 2rw Consultants, Inc. The revised sections are attached.

Company Name: _____ *Address:* _____ *Date:* _____

Authorized Signature: _____ *Title:* _____

Print Name: _____ *Telephone No.:* _____

Fax No.: _____

SECTION 23 5100 - BREECHINGS, CHIMNEYS, AND STACKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. CPVC sidewall boiler vents.

1.02 REFERENCE STANDARDS

A. NFPA 54 - National Fuel Gas Code; National Fire Protection Association; 2009.

B. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances; National Fire Protection Association; 2011.

C. UL 441 - Standard for Gas Vents; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.03 DEFINITIONS

A. Vent: That portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.

B. Vent Connector: That part of a venting system that conducts the flue gases from the flue collar of an appliance to a chimney or vent, and may include a draft control device.

1.04 SUBMITTALS

A. Refer to Division 01 requirements.

B. Product Data: Provide data indicating fabricated vent piping, including dimensional details of components, dimensions and weights, and connection requirements.

C. Shop Drawings: Indicate general construction, dimensions, weights, support and layout of breechings. Submit layout drawings indicating plan view and elevations.

D. Manufacturer's Instructions: Include installation instructions, and indicate assembly, support details, and connection requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with documented experience.

PART 2 PRODUCTS

2.01 CPVC SIDEWALL BOILER VENTS

A. CPVC Pipe: ASTM F 441.

1. Fittings: CPVC; ASTM F 439, Schedule 80.

2. Joints: Solvent weld with ASTM F 493 solvent cement. Solvent cement shall be low VOC.

B. Vent pipe sizes indicated on drawings.

C. Vent pipe shall not be insulated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 54.

C. At appliances, provide slip joints permitting removal of appliances without removal or dismantling of breechings, breeching insulation, chimneys, or stacks.

END OF SECTION

SECTION 23 5216 - CONDENSING BOILERS

PART 1 GENERAL

1.01 SCOPE

A. The work to be performed includes all new equipment, labor and materials required to furnish and install high-efficiency condensing hydronic boilers as described in this specification.

1.02 REFERENCE STANDARDS

A. ANSI Z21.13 - American National Standard for Gas-Fired Low-Pressure Steam and Hot Water Boilers; 2004 (addendum 2007).

B. ASME (BPV IV) - Boiler and Pressure Vessel Code, Section IV - Rules for Construction of Heating Boilers; The American Society of Mechanical Engineers; 2007.

C. ASME (BPV VIII, 1) - Boiler and Pressure Vessel Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels; The American Society of Mechanical Engineers; 2007.

D. HI BTS-2000 - Testing Standard, Method to Determine Heating Efficiency of Commercial Space Heating Boilers; The Hydronics Institute of AHRI; 2007.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2003.

F. NFPA 54 - National Fuel Gas Code; National Fire Protection Association; 2006.

G. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.

H. UL (HCVCE) - Heating, Cooling, Ventilating and Cooking Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, including rated capacities of selected model, weights (shipping, installed, and operating), installation and start-up instructions, along with furnished accessory information.

B. Shop Drawings: Submit manufacturer's assembly-type shop drawings indicating dimensions, weight loadings, required clearances, and methods of assembly of components.

C. Wiring Diagrams: Submit manufacturer's electrical requirements for boilers including ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.

1.04 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in the manufacturing of pulse combustion, high efficiency, condensing boilers, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 10 years.

B. The hot water boiler maximum working pressure will be 160 psig.

C. Pulse Boiler Flame Safeguard Control will be of an accepted quality manufacturer bearing ULCertification.

D. The entire boiler system and its installation shall conform to the manufacturer's instructions, applicable codes and associated National Board requirements.

E. The equipment shall, as a minimum, be in strict compliance with the requirements of this specification and shall be the manufacturer's standard commercial product unless specified otherwise. Additional equipment features, details, accessories, etc. which are not specifically identified but which are a part of the manufacturer's standard commercial product, shall be included in the equipment being furnished.

F. The equipment shall be of the type, design, and size that the manufacturer currently offers for sale and appears in the manufacturer's current catalog.

G. The equipment shall fit within the allocated space, leaving ample allowance for maintenance and inspection.

H. The equipment shall be new and fabricated from new materials. The equipment shall be free from defects in materials and workmanship.

I. All units of the same classification shall be identical to the extent necessary to ensure interchangeability of parts, assemblies, accessories, and space parts wherever possible.

J. In order to provide unit responsibility for the specified capacities, efficiencies, and performance, the boiler manufacturer shall certify in writing that the equipment being submitted shall perform as specified.

1.05 WARRANTY

A. Boiler manufacturer shall guarantee in writing equipment to be free of defects for one year after start-up date or 18 months from factory shipment, and to repair or replace at manufacturer's expense any defective parts. Unit shall receive such factory tests as are deemed advisable by the manufacturer to check construction and operation.

B. The pressure vessel shall be guaranteed against thermal shock for 10 years when utilized in a closed loop hydronic heating system with a maximum temperature differential rating of up to 170 °F. The boiler pressure vessel shall be guaranteed accordingly without a minimum flow rate or return water temperature requirement. The boiler shall not require the use of flow switches or other devices to ensure minimum flow.

C. The pressure vessel shall carry a 10-year warranty against material and workmanship defects.

D. The combustor and exhaust pipes (heat exchanger) shall be guaranteed against flue gas corrosion for a period of 10 years for carbon steel boilers and a period of 5 years for stainless steel boilers.

E. All parts not covered by the above warranties shall carry a one-year warranty. This shall include all electrical and burner components.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. This Specification is based on products as manufactured by Lochinvar Knight XL commercial hydronic heating boilers.

B. Refer to drawings for boiler capacities.

2.02 CONDENSING BOILER

A. Boiler Construction:

1. 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 configuration. The 316L stainless steel combustion chamber shall be designed to drain condensation to the bottom of the heat exchanger assembly. A built-in trap shall allow condensation to drain from the heat exchanger assembly.

2. 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 boiler shall be equipped with leveling legs.

B. Boiler Performance:

1. The boiler shall be operated on Natural Gas. The boiler shall be capable of full modulation firing down to 20% of rated input with a turndown ratio of 5:1.

2. 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. The boiler shall operate at a minimum of 94% thermal efficiency at full fire. The boiler shall operate up to 98% thermal efficiency with return water temperatures at 100°F or below. The boiler shall be certified for indoor installation. The boiler's Thermal Efficiency shall be verified through third party testing by the Hydronics Institute Division of AHRI and listed in the AHRI Certification Directory.

3. The boiler shall have an independent laboratory rating for Oxides of Nitrogen (NOx) of 20 ppm or less corrected to 3% O2. The manufacturer shall verify proper operation of the burner, all controls and the heat exchanger by connection to water and venting for a factory fire test prior to shipping.

C. Boiler Controls:

1. The boiler shall utilize a 24 VAC control circuit and components. The control system shall have an electronic display for boiler set-up, boiler status, and boiler diagnostics. All components shall be easily accessed and serviceable from the front and top of the jacket. The boiler shall be equipped with; a temperature/pressure gauge, high limit temperature control certified to UL353, ASME certified pressure relief valve, outlet water temperature sensor, return water temperature sensor, a UL 353 certified flue temperature sensor, outdoor air sensor, low water flow protection and built-in adjustable freeze protection.

2. The boiler shall feature internalcontrol with a LCD display password security, three loop temperature setpoints with individual outdoor air reset curves, pump delay with adjustable freeze protection, pump exercise, domestic hot water prioritization with DHW modulation limiting and USB PC port connection. The boiler shall be capable of controlling a variable speed boiler pump to keep a constant Delta T at all modulation rates. The boiler shall have the capability to accept a 0-10 VDC input connection for BMS control of modulation or setpoint, enable disable of the boiler, variable system pump signal and a 0-10VDC output of boiler modulation rate. The Boiler shall have a built-in sequencing options for lead lag or efficiency optimized modulation logic, with both capable of rotation while maintaining modulation of up to eight boilers without

utilization of an external controller. Supply voltage shall be 120 volt / 60 hertz / single phase.

3. The boiler shall be equipped with two terminal strips for electrical connection. A low voltage connection board with 42 data points for safety and operating controls, i.e., Auxiliary Relay, Auxiliary Proving Switch, Alarm Contacts, Runtime Contacts, Manual Reset Low Water Cutoff, Flow Switch, High and Low Gas Pressure Switches, Tank Thermostat, Three Wall Thermostat/Zone Controls, System Supply Sensor, Outdoor Sensor, Building Management System Signal, Modbus Control Contacts and Cascade Control Circuit. A high voltage terminal strip shall be provided for supply voltage. The high voltage terminal strip plus integral relays are provided for independent pump control of the System pump, the Boiler pump and the Domestic Hot Water pump.

4. The firing control system shall be direct spark ignition with electronic supervision.

D. Boiler Vent and Combustion Air Intake Piping:

1. The boiler shall be installed and vented with a:

a. Direct Vent Sidewall system with a horizontal sidewall termination of both the vent and combustion air. The flue shall be CPVC sealed vent pipe terminating at the sidewall with the manufacturers specified vent termination. The boiler's total combined exhaust venting length shall not exceed 100 equivalent feet. Foam Core pipe is not an approved material for exhaust piping.

b. A separate pipe shall supply combustion air directly to the boiler from the outside. The air inlet pipe shall be CPVC sealed pipe. The air inlet must terminate on the same sidewall with the manufacturer's specified air inlet cap. The boiler's total combined air intake length shall not exceed 100 equivalent feet.

2. Refer to Breechings Chimneys Stacks specification for piping requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Equipment and materials shall be installed in an approved manner and in accordance with the boiler manufacturers' installation requirements.

B. The installer shall construct a level continuous concrete pad for the entire boiler system according to the boiler manufacturer's erecting instructions.

C. Assemble unit sections and parts shipped loose or unassembled for shipment purposes. Follow manufacturer's installation recommendations and instructions.

D. Install electrical control items furnished by manufacturer per wiring diagram provided by manufacturer.

E. Complete water piping installation as required by manufacturer for operation of system.

F. Provide air intake and exhaust piping, size and type as recommended by the manufacturer.

G. Provide boiler manufacturer recommended manifold pipe and fittings from each boiler to nearest floor drain or as indicated.

H. Operating Manual

1. Instructions for installation, operation and maintenance of the boiler shall be contained in a manual provided with each boiler unit.

2. A wiring diagram corresponding to the boiler configuration shall be permanently affixed to the boiler near the electrical panel.

3.02 FIELD QUALITY CONTROL

A. After boiler installation is completed, the manufacturer shall provide the services of a field representative for starting the unit and training the operator.

B. Arrange with National Board of Boiler and Pressure Vessel Inspectors for inspection of boilers and piping. Obtain certification for completed boiler units, deliver to Owner, and obtain receipt.

END OF SECTION