PART 1 – GENERAL

1.1 SUMMARY

A. This section includes packaged, factory-fabricated and assembled, three pass firetube boilers, trim, and accessories for generating low pressure steam (15 psi).
The boiler operating pressure shall be _____ psi.
Refer to Section 2.2 “Forced Draft Burner” and select burner fuel type(s) and mode of operation.
   1. Horizontal three pass firetube boiler
      a. Two pass boiler construction is not acceptable.

1.2 SUBMITTALS

A. Product Data: Include performance data, operating characteristics, furnished specialties, and accessories.
B. Shop Drawings: For boilers, boiler trim, and accessories; Include plans, elevations, sections, details, and attachments to other work.
   1. Wiring Diagrams: Power, signal, and control wiring.
   2. Fuel Train Schematic

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For boilers, components, and accessories to include in emergency, operation and maintenance manuals.
B. Warranties: As specified in this section.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
B. ASME Compliance: Fabricate and label boilers to comply with ASME Section IV Boiler and Pressure Vessel Code.
C. ASHRAE/IESA 90.1 Compliance: Boilers shall have minimum efficiency according to: Gas and Oil Fired Boilers – Minimum Efficiency Requirements.”
D. UL Compliance: Control devises and control sequences according to requirements of UL.
E. CSD-1 Compliance: Boilers/burners equipped to meet current state code.
F. The boiler must be manufactured by a company having at least ten (10) years documented boiler manufacturing experience in accordance to ASME Section IV Boiler and Pressure Vessel Code.

1.5 COORDINATION

A. Furnish and coordinate size and location of concrete bases.

1.6 WARRANTY

A. Special Warranty: Manufacturer’s standard form in which manufacturer warrants the Boiler Pressure Vessel for five (5) years pro-rated after date of shipment with the first two (2) years non pro-rated. This warranty is to cover tube leaks and other possible damages to boiler tubes, tube sheets, furnace, and main shell due to thermal shock expansion stresses (“shock”). In additional to the above pressure vessel warranty the burner, trim, and controls are warranted for a period of one (1) year after installation.

PART 2 – PRODUCTS

2.1 HORIZONTAL THREE PASS FIRETUBE BOILER

A. Basis of Design Product: Subject to compliance with requirements, provide products as listed:
   1. Aldrich Company – Manufactured in Wyoming, IL, Model: _____
B. Description: Factory packaged and firetested firetube boiler complete with gas burner, gas train, and controls mounted and wired, skid mounted requiring only supply, return, fuel, blowdown, electrical and vent connections.
C. Fabricate base and attachment to pressure vessel with reinforcement strong enough to resist boiler movement during a seismic event when boiler base is anchored to building structure.
D. Design: Modified Scotch design "Scotch Box" with straight steel tubes with a minimum wall thickness of .105".
   Three passes with wet-back design. Boilers not of the wetback design are not allowed. Include the following:
   1. Handholes or inspection tappings for water-side inspection.
   2. Lifting lugs on to of boiler.
   3. Minimum 1" drain valve
   4. Tappings or flanges for supply and return connections
E. U-Type Flex Joint: The furnace must incorporate a "U-Type" flex joint. The "U-Type" flex joint burner port to furnace minimizes the effects of differential stress as the boiler furnace expands at a greater rate than the firetubes during operation. Boilers with other types of furnace to front tube sheet construction are not allowed. Boiler designs with furnaces that extend through the front tube sheet are not acceptable.
F. Front and Rear Smokeboxes: Sealed with heat-resistant gaskets and fastened with lugs and cap screws and designed so tubes and flues are fully accessible for inspection or cleaning when doors are open.
G. Rear Access Door: Constructed with ceramic fiber insulation in door construction.
H. Boiler Casing: The external surfaces shall be covered with a minimum of 1" mineral fiber insulation encased within an 18 gauge steel jacket.

2.2 FORCED DRAFT BURNER

A. Basis of Design Product: Subject to compliance with requirements, provide products as listed:
   1. Power Flame, Model: _____

B. Code Compliance: UL, CSD-1
C. Available Fuels:
   Select from the following: Natural gas, LP gas, #2 oil, combination gas/#2 oil or digester gas.
D. Mode of Operation:
   Select from the following: On-Off, Low-High-Off, Low-High-Low, Full Modulation
E. Burner must be factory mounted and wired including control panel.
F. Blower: Forward-curved centrifugal fan integral to burner, directly driven by motor.
G. Gas Train: Control devices shall comply with requirements in ASME CSD-1 and UL. Gas train to include pilot shut-off valve, regulator, pilot solenoid valve, intermittent electric spark pilot ignition with 100 percent main valve and pilot safety shutoff with electronic ultra violet supervision of burner flame (flame rod not acceptable).

H. Main Gas Train: Factory piped and wired (may be removed for shipment as a complete assembly for protection), main gas regulator, motorized main gas safety shut off valve, secondary solenoid gas safety shut off valve, isolation valve(s) with test cock(s), high and low gas pressure switches.

2.3 LOW PRESSURE STEAM BOILER

A. Boiler to include the following trim factory mounted/wired:
   1. 4-1/2" steam gauge
   2. ASME relief valve
   3. Operating pressurestat
   4. High limit pressurestat (Manual Reset)
   5. Firing rate control to match mode of operation
   6. M&M #157S-MD Low water cut-off/feed control
   7. M&M #750-MT Probe type second low water cut-off (Manual Reset)
   8. Stack Damper: Flue stack damper (Manual type)

2.4 SOURCE QUALITY CONTROL

A. Test and inspect factory-assembled boilers, before shipping according to ASME Boiler and Pressure Vessel Code.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Before boiler installation, examine roughing-in for concrete equipment bases, anchor bolt sizes and locations, and piping and electrical connections to verify actual locations, sizes, and other conditions affecting boiler performance, maintenance, and operations.
   1. Boiler locations on drawings are approximate. Determine exact locations before roughing-in for piping and electrical connections and consult mechanical engineering Project Manager for approval prior to proceeding.
B. Examine mechanical spaces for suitable conditions where boilers will be installed.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 BOILER INSTALLATION

A. Equipment Mounting: Install boilers on cast-in-place concrete equipment bases.
   1. Coordinate sizes and locations of concrete bases with actual equipment provided.
   2. Construct bases to withstand, without damage to equipment, seismic force as required by code.
   3. Construct concrete bases 4" high and extend base not less than 6" in all directions beyond the maximum dimensions of boiler unless otherwise indicated.
B. Install gas-fired boilers according to NFPA-54.
C. Install electrical devices furnished with boiler but not specified to be factory mounted.
D. Refer to drawings for additional requirements.

3.3 START-UP SERVICE

A. The mechanical contractor is required to engage a factory authorized service representative to perform start-up services and provide owner's maintenance personnel training on the adjustment, operation and recommended maintenance of the boilers.

END OF SECTION