

## **SECTION 23 55 50 – BOILERS**

### **PART 1 - GENERAL**

#### **1.1 WORK INCLUDED**

- A. Provide labor, materials, equipment and services as required for the complete installation as shown on the Contract Documents.
- B. This Section includes packaged, factory-fabricated and assembled, gas fired, condensing, finned water-tube boilers, trim and accessories for generating hot water.

#### **1.2 SUBMITTALS**

- A. Boiler and accessories. Complete installation drawings, installation and start-up instructions, wiring diagrams, and instruction manuals from manufacturer of equipment.
- B. Shop Drawings: For boilers, boiler trim, and accessories. Include plans, elevations, sections, details, and attachments to other work.
  - 1. For installed products indicated to comply with design loads.
  - 2. Wiring Diagrams: Detail power, signal, and control wiring.
- C. Operation and Maintenance Data: For finned water-tube boilers to include in emergency, operation, and maintenance manuals.

#### **1.3 QUALIFICATIONS**

- A. Unit shall have UL label.
- B. Boiler Energy Efficiency: In accordance with the New York State Energy Conservation Construction Code (latest edition).
- C. Boiler Construction: In accordance with ANSI Z21.13b-1994

#### **1.4 MANUFACTURER'S WARRANTY**

- A. Sixty months extended warranty for refrigerant system.

### **PART 2 - PRODUCTS**

#### **2.1 PACKAGED BOILERS**

- A. General:
  - 1. Provide a complete hot water boiler with controls. Factory assembled, piped, internally wired, tested, and ready to operate.

2. Unit cabinet constructed of painted galvanized steel or thermo-plastic.
  3. Unit heat exchanger shall be constructed of stainless steel and designed to drain condensation to the bottom of the heat exchanger assembly.
  4. All components shall be accessed and serviceable from the front and top of the jacket.
- B. Controls:
1. The boiler shall have a LCD display connected to a digital controller device with temperature and spark/hot surface igniter. The controller shall fully adjust the firing rate to maintain desired output temperature, display shall allow for boiler set-up, status and diagnostics.
  2. Provide for outside air reset function.
  3. Provide 0-10 VDC input connection with the building DDC system.
  4. Provide control items compatible with temperature control sequences as called for in 239720.
- C. Venting:
1. Direct Vent – The boiler shall be a sealed combustion system. The combustion air intake and exhaust shall be PVC and terminate with a manufacturers specified vent termination.
  2. Foam Core pipe is not an approved material for either intake/exhaust piping.
- D. Design Equipmen: Lochinvar.
- E. Make: Lochinvar, Munchkin.

## **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. Final boiler locations indicated on Drawings are approximate. Determine exact location before roughing-in for piping and electrical connections.
- B. Examine mechanical space for suitable conditions where boilers will be installed. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 BOILER INSTALLATION**

- A. Install Boilers level on 4" concrete base.
- B. Concrete Bases: Anchor boilers to concrete base.
  - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around full perimeter of base.
  - 2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
  - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 4. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Install gas-fired boilers according to NFPA 54.
- D. Assemble and install boiler trim.
- E. Install electrical devices furnished with boiler but not specified to be factory mounted.

### **3.3 CONNECTIONS**

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect gas piping full size to boiler gas-train inlet with union.
- C. Connect hot-water piping to supply and return boiler tappings with shutoff valve and union or flange at each connection.
- D. Install piping from safety relief valves to nearest floor drain.
- E. Connect breeching full size to boiler outlet.
- F. Install piping adjacent to boiler to allow service and maintenance.
- G. Ground wiring according to Division 16.
- H. Connect wiring according to Division 16.
- I. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### **3.4 STARTUP SERVICE**

- A. Engage a factory authorized service representative to test, inspect, and adjust boiler components and equipment installation to perform startup service.
- B. Perform installation and startup checks according to manufacturer's written instructions.
- C. Leak Test: Hydrostatic test. Repair leaks and retest until no leaks exist.
- D. Operational Test: Start units to confirm proper motor rotation and unit operation. Adjust air fuel ratio and combustion.
- E. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- F. Adjust initial temperature set points.
- G. Set field-adjustable switches and circuit breaker trip ranges as indicated.
- H. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose, without additional cost.
- I. Prepare written report that documents testing procedures and results.

### **3.5 DEMONSTRATION**

- A. Engage a factory authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain finned water-tube boilers.

**END OF SECTION**