CONDENSING BOILERS

DESIGN GUIDELINES

1. Summary
   a. This Section includes packaged, factory-fabricated and-assembled, gas-fired condensing boilers, trim, and accessories for generating hot water.

2. Heating Hot Water Design Requirements
   a. Shall be designed with a maximum heating water supply temperature of 140°F. Design in this fashion reduces heat losses and ensures that the heating water system always operates in a range that will ensure flue gas condensation.
   b. Shall be designed in a variable flow, primary only pumped configuration.
   c. Boiler shutoff control valves shall be installed to stop the flow of hot water to offline boilers.
   d. If all boilers are offline, control logic shall force all boiler isolation valves full open.

3. Boilers
   a. Condensing boilers shall be capable of operation down to 15% of design water flow.
   b. Boilers shall be warranted to operate down to zero water flow without damaging the boiler.
   c. 15:1 turndown capability.

4. Location and Layout Requirements
   a. Located for easy maintenance, replacement without disassembling or without removing flue ductwork or piping.
   b. Boiler to withstand seismic forces.
      - The drawings shall indicate the specific requirements, including snubber size, anchor bolt size, embedment depths, edge distance requirements, anchor spacing requirements.
   c. Piping shall be arranged so that the service valves can be closed and the piping and specialties between the service valves and boiler can be removed for servicing.
   d. Flanges or Victaulic couplings shall be located to allow removal of a minimal amount of piping to main the boiler.
   e. All specialties and service valves shall be line size, and not boiler connection size.

5. DDC Controls
   a. Building Automation via direct digital control shall be provided for boilers.
   b. Controls shall be arranged such that a boiler controller monitors and controls boiler staging, or that the building automation controls boiler staging.
   c. If a boiler controller is provided, this device shall be integrated to the building automation system.
   d. At a minimum, the following boiler points shall be monitored:
      - Entering water temperature
• Leaving water temperature
• Status
• Enable
• Disable
• Control valve command
e. At a minimum, the following control commands shall be accepted by the boiler from the building automation system:
   • Supply water temperature setpoint
   • Enable
   • Disable.

6. Related Sections.
   a. Breechings, Chimneys and Stacks
   b. DDC Controls

EQUIPMENT and PRODUCT REQUIREMENTS

1. Condensing Boilers
   a. Description: Factory-fabricated, assembled and tested, condensing boiler with heat exchanger sealed pressure tight, built on a steel base; including insulated jacket; flue-gas vent; combustion-air intake connections; water supply, return, and condensate drain connections; and compatible controls.
   c. Pressure Vessel: Carbon steel with welded heads and tube connections.
   d. Burner: Natural gas, self-aspirating and self-venting after initial start.
   e. Blower: Centrifugal fan to operate only during start of each burner sequence.
   f. Boiler shall be configured for sealed combustion.

END OF SECTION