



WESTWOOD PUBLIC SCHOOLS

SCOPE OF WORK

Downey School Boiler Install

Downey Elementary School - 250 Downey Street Westwood MA

General Requirements:

Remove and dispose of properly existing Boiler #2 HTP boiler. Furnish and install (1) high efficiency commercial hydronic boiler with gas burner in accordance with manufacturer's recommendations and all applicable state and local codes.

Installation to be complete in all aspects including all piping, valves and hangers for gas, vent, heating water, feedwater, blowdown and all electrical. Provide individual gas shutoffs per section.

Repair / restore number all boiler flue back to original location.

Install boiler-burner unit in compliance with manufacturer's installation instructions. All work must be done in a neat and work man like manner.

The boiler shall be an HTP, Inc. model 1000, having a modulation input range of 1,000,000 Btu/Hr, and shall operate on natural gas. The boiler shall be capable of full modulation firing down to 20% of rated input with a turndown ratio of 10:1.

The boiler heat exchanger shall be certified and stamped for 160PSI, and shall be National Board Listed. There shall be no banding material, bolts, gaskets, or "O" rings in the header configuration. The heat exchanger is removable from the cabinet for replacement without removing the entire boiler assembly from the site. The stainless steel combustion chamber shall be designed to have a trough located on the bottom front and back sections leading to the middle to ensure that condensation does not collect in the boiler. The complete heat exchanger assembly shall have a 15 (fifteen) year limited warranty or BEST AVAILABLE.

The boiler shall be certified and listed by ETL under the latest edition of the harmonized ANSI Z21.13 test standard for the US 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 a minimum of 94% thermal efficiency. The boiler shall be certified for indoor installation.

The boiler shall be constructed with a heavy gauge steel jacket assembly, primed and pre-painted on both sides. The boiler jacket shall afford easy access to all components through

easily removable access doors to facilitate service of all components. 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 grade Inconel with 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 control cabinet shall be equipped with two screw type terminal strips. One of the terminal strips is designated for low voltage connections, including thermostat, DHW sensor/thermostat or system sensor, outdoor sensor, and 0-10VDC input signals. The other terminal strip is designated for 120 volt connections for incoming power, central heat (CH) and DHW (indirect water heater) pump operation and alarm/system pump operation. The pump outputs are 4 amp fuse protected. The control cabinet will also include two RJ-45 style jacks for cascade communication bus wiring using CAT 5 or CAT 3 cables. All of these connections and fuses are accessed from the outside of the boiler by removing an access door. The electrical supply shall be 120/60/1. Two additional electrical connections are provided internal to the boiler cabinet for the connection of optional high and low gas pressure switches and UL 353 approved low water cutoff switch.

The boiler shall utilize a 24 VAC control circuit and components. The control system shall have an LED display for boiler setup, boiler status, and boiler diagnostics. All components shall be easily accessed and serviceable from the front, right, and left sides of the jacket. The boiler shall be supplied with a temperature/pressure gauge (field installed) high limit temperature control with manual reset, ASME certified pressure relief valve, outlet water temperature sensor, return water temperature sensor, blocked vent pressure switch, flue temperature sensor, and built-in freeze protection. The boiler shall also be equipped with an outdoor air reset function. The manufacturer shall verify proper operation of the burner, controls, safety devices, and the heat exchanger by connecting to water and venting for a factory fire test prior to shipping.

Note- the Boiler shall be wired to a functional outdoor air reset function that operates with the other two Boilers.

The boiler shall include an ON/OFF power switch and feature the 926 intelligent control system with digital LED display and LED status indicators for System Pump, DHW Pump, Boiler Pump, Flame On, and Fault Indication. Pump operation and combustion system can be manually operated to assist the installer in system commissioning. The control will have password protection for the installer to set limits and configure outdoor reset. The control will have freeze protection (which can be optionally disabled for snowmelt applications), outdoor reset, indirect priority with operation time limits, and a 0-10VDC input for building management system (i.e. programmable to control either boiler temperature or firing). The boiler control is

equipped for boiler sequencing for up to eight boilers for greater system turndown and system backup.

The boiler shall be equipped with a condensate collection system equipped with an internal float switch which will protect the boiler from condensation backing up into the combustion chamber. The condensate collection system will be equipped with a 2" IPD threaded cleanout port to allow for easy cleaning and sediment removal.

The boiler shall be installed and vented with:

Direct Vent System with Vertical Rooftop Termination – Where both the air intake and exhaust vents terminate in a two pipe configuration or through a factory approved rooftop termination kit. The flue shall be Category IV approved Stainless sealed vent material terminating at the rooftop with the manufacturer's specified vent termination. A separate pipe shall supply combustion air directly to the boiler from the outdoors. The air inlet pipe may be PVC or CPVC sealed pipe. The boiler's total combined air intake length shall not exceed 100 equivalent feet. The boiler's total combined exhaust venting length shall not exceed 100 equivalent feet. The air inlet must terminate on the rooftop with the exhaust. Foam core pipe is not approved material for exhaust venting.

The boiler shall operate at altitudes up to 4500 feet above sea level without additional parts or adjustment.

Maximum unit dimensions shall be comparable to existing and enable access to existing and new.

Start-up and Service:

The contractor shall obtain the services of a factory authorized agent to provide burner light-off and adjustment. The start-up agent shall provide a burner light-off report as written proof that the burner was adjusted to optimum performance.

The authorized agent shall provide a one-year warranty after start-up.

The contractor will be responsible for all permits and contacting local Fire Department for any welding concerns within building.

All work must be complete within stated time frame. Vendor is responsible for any permits needed.

Required Tasks

The tasks that must be performed in order to replace the failed boiler include, but are not limited to, the following:

- Disconnect and lock out of the natural gas and electrical connections- PER OSHA LOCKOUT / TAGOUT REQUIREMENTS
- Isolate and drain the system as necessary
- Disconnect of hot water piping header and pumps servicing existing boilers.
- Disconnect and remove combustion air system for existing boilers, removal of all connections
- that will not be required by the resulting system
- Demo, remove and proper disposal of (1) HTP Boiler MOD CON 1000- parts of existing shall be discussed with the owner, any parts that are worth placing on shelf per owners approval.
- Provide and install (1) new HTP HTPXLX1000FBN
- exchangers in the same footprint as the failed boilers
- Provide and install new hot water pump for new boiler system
- Reconfigure hot water piping header and gas line feeds to accommodate new boiler configuration
- Reconfigure combustion air system to accommodate new boiler configuration
- Reconnect electrical connections
- Installation of stack condensate drains
- Installation and interconnection of the necessary sensors and controls
- Install piping from the equipment drain and stack connection drains to the condensate neutralization kit and to nearest floor drain.
- Fill system as necessary
- Start system and confirm system functionality

Calibrate and/or program the system to meet the required functionality

Test all safety devices