

Case Study

Elm Street Elementary

Boiler Replacement Needs: With failing oil-fired boilers and an aging, inefficient heating system, Elm Street Elementary School turned to modulating boilers from Weil-McLain to spark energy efficiencies and lower heating costs for the school.

Project Installation Date: October 2015

Type of Facility: Educational

Name of Building: Elm Street Elementary

Location: Gardner, Mass.

Construction Details: Boilers required for job - three

Solution: Three Weil-McLain® 88 Series boilers

Engineering Firm: MacRitchie Engineering, Inc.

Background

Built in 1923, Elm Street first served as a high school, but over time, the district converted the facility into an elementary school. Today, the 130,000-square foot facility holds more than 500 students.

“Our heating system consisted of two nearly 20-year-old boilers that were in constant need of repair,” said Robert O’Brien, director of facilities for Gardner Public Schools. “We found ourselves changing out cast iron sections on an annual basis. In addition to the maintenance issues, we wanted to decrease our overall heat load.”

To assist with project funding and help cover boiler replacement costs, the school applied for and received a green repair grant from the Massachusetts School Board Authority (MSBA). The MSBA Green Repair Program offers districts the opportunity to repair or replace roofs, windows and/or boilers in public school facilities that are otherwise structurally, functionally and educationally sound.

With funding in place, the school selected MacRitchie Engineering, based in Braintree, Mass., which provides HVAC, plumbing and electrical design services, to handle the boiler replacement.



Elm Street Elementary in Gardner, Mass.



The 88 Series boiler from Weil-McLain

Case Study (Cont'd)

Elm Street Elementary

"We sought a dual combination gas and oil commercial boiler and Weil-McLain was my primary choice," said O'Brien. "We also wanted units with the ability to modulate with a control package that could be implemented into a building management system."

"We received three competitive offerings when the project was put out for bid and we chose Weil-McLain because the equipment had the best load matching characteristics," said O'Brien.

The team chose three Weil-McLain 88 Series low pressure steam boilers as the optimal choice to match heating load requirements, with two carrying the building load and one installed for redundancy. MacRitchie was also tasked with handling oil conversion to add gas for dual fuel firing, boiler room valves, boiler feed unit, fuel oil pumps and controls, and associated electrical and plumbing work.

The Weil-McLain 88 Series boilers offer up to 85.7% thermal efficiencies, are operational in single or multiple systems as gas, oil or gas/oil, and feature modulation control.

The old oil-fired burners were removed and replaced with the Weil-McLain dual fuel boilers and configured with gas as the main fuel source and oil as a backup. Each boiler was installed with its own pump plus a common manually valved standby pump.

The project was completed and the units were placed in operation in October 2015.

Numerous Benefits Realized

According to O'Brien, the installation went smoothly and the school is already experiencing benefits.

"We expect to save anywhere from 20% to 25% of our fuel costs with these new boilers because they are more energy efficient, feature low-range pressure controls and have the ability to modulate," said O'Brien.

Modulating burners are designed to control the burner output to match the boilers' variable load requirements to ensure maximum combustion and boiler efficiencies during large heating demands. The modulation feature also has decreased the system pressure. "Thanks to modulation, we reduced the amount of operating pressure

from about 10 pounds on a cold day to about 5 pounds," said O'Brien.

"Dropping the pressure created a lot of savings, yet we are still maintaining the temperature inside the building, so that's a definite plus."

The expected duration and life of the boilers are another plus, according to O'Brien. Other benefits building staff are realizing include the adoption of a building management system that will send notifications via email and sound an audible alarm in the school if an issue should arise.

"If a boiler burner should misfire, for example, I immediately get an email and an audio alarm goes off in the school," said O'Brien.

"This alerts school custodian staff that an issue is happening, and it's an important safety feature to have."



Three new Weil-McLain 88 series boilers installed in the Elm Street Elementary boiler room