



CASE STUDY: 007

- ▼ CUSTOMER: WOODLAND ELEMENTARY SCHOOL
- ▼ FULTON REP: RYAN COMPANY
- ▼ MARKET: K-12 EDUCATION
- ▼ APPLICATION: GEOTHERMAL BUILDING HEAT
- ▼ EQUIPMENT: ENDURA+ (3,000 MBTU/HR)

FULTON'S NEW EDR+ BOILER SHOWS OFF ITS FEATURES

BOILER COMPLEMENTS
GEOTHERMAL HEAT PUMPS AT
MINNESOTA ELEMENTARY SCHOOL



Living far enough north to experience temperatures of -30 °F during the winter months, the people of Alexandria, MN know a thing or two about the importance of installing high-performance heating systems.

That's why, in June of 2009, when their school district decided to build Woodland Elementary School, it chose to install some of the most energy-efficient, environmentally clean, and cost-effective heating systems available:

- ▼ Condensing boilers; and
- ▼ Geothermal heat pumps

WHY FULTON'S ENDURA+?

A geothermal (or ground-source) heat pump uses ground temperature, which stays about 55 °F year round, as a heat source in the winter and a heat sink in the summer.

"Because of the high turn-down ratio of the boiler, we are using [it] in warmer . . . months."

While a heat pump's major advantage is reduction of energy use, they can sometimes malfunction altogether, creating an emergency heating need.

This is what occurred with the heat pumps installed at Woodland Elementary, says Jerry Bitzan, District Buildings and Grounds Supervisor for the Alexandria School District.

Says Jerry, "The heat pumps failed. So when we decided we needed to re-do the heat pumps, we added Fulton's ENDURA+ boiler. So in case the heat pumps failed again, we would have the redundancy needed to heat the building adequately."

"We are also using the ENDURA+ boiler for warm-ups on super-cold mornings. Because of the high turn-down ratio of the ENDURA+ boiler, we are using the boiler to supplement the heat pump heat in warmer as well as our coldest winter months."

DURABILITY AND QUALITY

The purchase of Fulton's ENDURA+ boiler came with strong recommendations. Bryan Petricka, Sales Engineer at Ryan Company Inc., had shared the information with the consulting engineer on the project, Randy Christenson. Randy had previously recommended Fulton boilers, so Randy endorsed the purchase.

"We had great success with Fulton . . . the durability and the quality of the materials used is the outstanding thing."

All that was left was to make sure the boiler would work with the geothermal system, and that the size of the boiler would match the demand load (3.0MM BTU/hr). This would ensure that the single boiler could handle the entire heating load for the school in the event of a complete failure of the geothermal system.

- ▼ ENDURA+ condensing boiler shown alongside supply and return headers (right side) that connect to Woodland's geothermal well field.



Said Randy, "We've had great success with Fulton. There's always maintenance to do on a yearly basis, but the durability and the quality of materials used is the outstanding thing.

"The other important factor is the high turn-down ratio so that we can we run this boiler at low flows and low temperatures to save energy."

Randy also emphasized the importance of the integration of controls. He complimented Fulton on its ability to provide controls which can integrate hybrid heating systems like this one, or multiple boilers, and still use only one boiler control.

"The other important factor [with the ENDURA+] is the high turn-down ratio so that we can run this boiler at low flows and low temperatures to save energy."

He further praised the important energy savings provided by the condensing technology of the ENDURA+, "the fact that they could reuse valuable heat energy rather than just sending it up the flue."

SIMPLIFIED INSTALLATION

Just as complimentary, Robert Maxfield, service technician and installing contractor with L&M Boiler Systems, Inc. in Austin, MN commented:

"The installation access of that boiler was superb. The piping was really, really easy. The flanges on the back of the boiler were easily accessed, and we had lots of room to install it.

"That's a 3.0MM BTU boiler that we put in through a doorway, which is a huge deal, actually, as I don't know of any other 3.0MM BTU condensing style boiler that can do this."

It was additionally important that the ENDURA+ could be installed with variable primary flow piping. This is the simplified piping method wherein the hydronic heating loop flows directly through the boiler to enhance temperature control and efficiency.

"The installation access was superb . . . the piping was really easy . . . I don't know of any other 3MM BTU condensing style boiler that [can fit through a standard doorway]."

SERVICE EXCELLENCE

The people involved in setting up the ENDURA+ were also a big part of its success. Factory-authorized service personnel came out for the installation to perform start-up procedures, and to make sure the boiler was operational in all aspects.

Said Randy, "I think that's one thing that Fulton does very well, as does Ryan Company. They make sure there is enough time and enough visits for service people to come out and make sure the boiler is operating at the right parameters."

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▲ The ENDURA+ seven-inch touchscreen control that allows quick access to detailed status information.

APPLICATION FLEXIBILITY

Once fully operational, the ENDURA+ demonstrated its ability to automatically maintain heating water comfort levels.

Since the boiler, as a redundant heat source, connects to the back side of the geothermal heat pump system, it had to adjust to the constant change of flow through the heat pumps. This required the ENDURA+ to go to low flow (sometimes only 80 GPM), which it did without any worry of low-flow cutoff.

"We could easily match the [boiler] firing rate to the flow," said Randy.

The ENDURA+, as part of a geothermal system, also required the hot water on its geothermal side to be operated at only 120 °F. But this was no problem for the ENDURA+ because it could easily match this temperature while achieving peak condensing efficiencies.

In fact, the low-temperature, geothermal heating loop was a perfect fit for maximizing the energy savings (96.3% AHRI Certified Thermal Efficiency) that the ENDURA+ was designed for.

O₂ COMPENSATION KEY

The ENDURA+ also demonstrated its ability to boost combustion efficiency across all modulation rates by automatically tuning the air/fuel ratio in real time—what is also known as O₂ trim control or O₂ compensation.

This was especially important due to the wide swings in local outdoor temperature.

Commented Randy, "In Alexandria, Minnesota, we see outdoor air temperatures from minus 25 °F to 95 °F. For re-heat, the system can operate up to an outside air temperature of 65 °F. So the boiler needs to operate under many varying conditions."

HIGHLY RECOMMENDED

The ENDURA+ was not Alexandria School District's first experience with Fulton, as they have Fulton boilers at Lincoln Elementary as well as Discovery Middle School.

"And both of those systems have worked great since day one," says Jerry. "We've only had a few issues that were corrected right away."

So the deciding factor for purchasing the ENDURA+ was as much the quality of the Fulton brand as it was a chance to try out a new and highly-efficient boiler.

Adds Jerry, "I would definitely recommend Fulton boiler equipment. The Fulton reps are great to work with. They're good people, always wanting to please you."



"We've already gone through a winter with the ENDURA+, and we noticed some savings on our heating bill."

"I would definitely recommend Fulton boiler equipment."

FULTON HEATING SOLUTIONS, INC.

Fulton Heating Solutions is an American company headquartered in Pulaski, NY. Backed by over 65 years of research,

innovation and experience, Fulton designs and manufactures heat transfer equipment for a wide range of commercial and industrial applications.

RELEVANT LINKS:

Woodland Elementary
www.alexandria.k12.mn.us/woodland

Ryan Company, Inc.
www.ryancompanyinc.com

Fulton products for education:
www.fulton.com/education

Find your local sales representative online at:

www.fulton.com/sales



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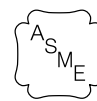
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