

# HYDRONICS ZONE

# WET HEAT ELITE

## Minnesota Housing Project Gets Energy, Comfort Upgrade

**S**adly, it's rare to hear about comfort and affordable housing together as one. Too often, there's a compromise. At the losing end, it's comfort that seems to always give way to price and ease of installation.

Yet managers of Prairie Meadows, a Section 8 housing community in Eden Prairie, Minnesota, stood firm to make the change.

Built in the '70s, the housing complex is undergoing a sweeping retrofit, aided by government funding.

According to Richard Reynolds, 15-year boiler maintenance manager at Prairie Meadows, it's not common for residents of Section 8 housing to experience the unusual comfort of hydronic heat.

But, the facility managers recognized Prairie Meadows is considered home for 500-plus residents; it's the one place where they seek comfort.

Many of the occupants are fam-



**FINAL TOUCHES:** Mike Jackson (left), pipefitter foreman, Associated Mechanical, and Nick Kruse (right), field support and trainer, Michel Sales, perform final boiler commissioning in one of the mechanical rooms.

ilies with children, though there are plenty of seniors and those with physical disabilities as well.

Apartments range from 850-1,000 square feet with one, two, and three bedrooms.

The phased, \$10 million renovations to Prairie Meadows, a 10-building, 180-unit campus, concluded in late 2017.

While there was some attention given to cracked sidewalks, kitchen upgrades, and plumbing fixtures, the main focus was an energy-efficient retrofit to all of the apartment buildings.

Work included door and window replacements, some new appliances, insulation, and some roofing. Though the big, old cast-

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**ANALYZE THIS:** Kruse (left) completes a combustion analysis on one of the Laars Mascot boilers. Working with him are Larry Sandberg (middle), field support and technical trainer, Michel Sales, and Mike Jackson (right), Associated Mechanical pipefitter foreman.



**HEAT CURVE:** Kruse sets up a heat curve for one of the Laars boilers. With an efficiency of 95 percent AFUE, input of 199 MBH, 10:1 turndown, and the capability of cascading up to 20 boilers for larger structures and redundancy, the new boilers have given managers and residents peace of mind.

“Our state government has regulations and energy standards when it comes to building efficiency; they’re slowly trying to switch everything to high-efficiency systems. The mechanical systems at Prairie Meadows — with gradually falling energy efficiency measurements — no longer made the cut. Even though many were still operating, they had to go.”

— Reid Mathiason,  
project manager,  
Associated Mechanical,  
Shakopee, Minnesota

iron boilers still worked, they were gluttons for maintenance and natural gas.

According to Reynolds, it was determined the old systems operated at efficiencies of 65-75 percent AFUE.

It’s no mystery that a bump of 20-30 percent fuel efficiency caught the attention of the facility managers tasked with planning the renovations.

### THE RIGORS OF MINNESOTA WINTERS

Through the years, the original boilers required

frequent expensive or time-consuming maintenance and service work. All too often, it occurred during the winter months, when downtime could cause extreme discomfort or trouble for residents.

For those who’ve never experienced winter at its worst in Minnesota, it’s hard to describe.

Roaring winds frequently sweep through the state, delivering an average of 170 inches of snow. Temperatures can reach minus 50°F, too cold even for ice fishing. And, try as it might, the state’s travel bureau

can’t beat the stats: Minnesota is often rated by national weather services as the worst state in 50, winter-wise.

### IMPORTANCE OF EFFICIENCY

“Our state government has regulations and energy standards when it comes to building efficiency; they’re slowly trying to switch everything to high-efficiency systems,” explained Reid Mathiason, project manager at Shakopee, Minnesota-based Associated Mechanical, the plumbing and mechanical contracting firm chosen to install new heating systems at the apartment complex.

“The mechanical systems at Prairie Meadows — with gradually falling energy efficiency measurements — no longer made the cut,” he added. “Even though many were still operating, they had to go.”

The state of Minnesota provides a high level of public and private support for energy-efficient technologies. They offer utility incentives and energy-efficiency programs that are accessible to a wide variety of commercial and industrial companies, including financial incentives for upgrades and systemwide improvements.

### COMFORT UPGRADE

Laars Mascot FT firetube boilers were selected for the retrofit project. With an efficiency of 95 percent AFUE, input of 199 MBH, 10:1 turndown, and the capability of cascading up to 20 boilers for larger structures and redundancy, the new boilers have given managers and residents peace of mind.

“Laars Mascots were chosen for this job because they had standard features that weren’t even options with other brands — like integral circulating pumps,” said Mike Jackson, job site superintendent, Associated Mechanical. “With circulating pumps built into the boilers, we didn’t have to supply one for each system at an additional cost to us, or added work. So, those advantages helped as system selections were made as well.”

Associated Mechanical began work in July and stayed busy through September.

In preparation for the work to begin, demo contractors gutted the mechanical room in each building, including final eviction of the old cast-iron boilers.

Associated had a three-man crew installing the boilers. While two technicians finished up one mechanical room, the third began preparations at the next.

One facet of the demolition caught the eye of a technician or two — the gradual deterioration of pipes, exhaust flues, and heat exchangers caused by acidic condensate. It’s a tough challenge for on/off boilers, combined with record-setting winter temperatures. Thanks to careful maintenance, this challenge was kept in check, though eventually, the old systems would surely succumb to the effects of condensate.

But, what was once a challenge is now an advantage. The new modulating-condensing systems welcome the presence of condensate.

The boilers and the PVC flues are built to take the presence of acidic condensate in stride. In fact, the boilers gain in operational

efficiency by stripping Btus from the fluid before the exhaust process is completed.

Nick Kruse, field support and trainer at St. Paul, Minnesota-based Michel Sales Agency, explained the new boilers are wall-hung, which also saved space in the tight basement mechanical rooms, and piping was designed in a primary secondary fashion.

“Each apartment building now has two to three of the Mascot boilers,” added Larry Sundberg, technical training and field support at Michel Sales. “The system was designed with a lead-lag configuration with equal runtime for greater efficiency and reliability.”

### DIALED-IN COMFORT

Boiler operation is now controlled by the outdoor reset built into each boiler’s circuitry.

“This alone brought a whole new level of comfort for residents of the apartment complex,” added Sundberg. “Before, residents had one- or two-zone systems that simply operated by an ‘on’ or ‘off’ function.

“Essentially, it was either hot or cold,” he continued. “Now, with gradual, seamless boiler modulation, and with operation tied to outdoor conditions, residents are finding out firsthand what hydronic comfort truly means — with warmth that’s easily controlled.”

*Information courtesy of Rachel Ruhl, an account manager and writer for Common Ground. Ruhl writes about HVAC, hydronic, plumbing, mechanical, radiant heat, geothermal, solar, and broad building systems industries. For more information, call 717-664-0535 or email cground3@ptd.net.*