





# Dialed-in comfort

Minnesota housing project gets energy/comfort upgrade

By Rachel Ruhl

It's rare to hear about "comfort" and "affordable housing" together as one. Too often, there's compromise. At the losing end, it's comfort that gives way to price and ease of installation. Yet, managers of Prairie Meadows, a Section 8 housing community in Eden Prairie, Minnesota, a suburb of Minneapolis, stood firm to make the change. Built in the '70s, the housing complex is undergoing a sweeping retrofit, helped by government funding.

Richard Reynolds, 15-year boiler maintenance manager at Prairie Meadows, says it's not common for residents of Section 8 housing to experience the unusual comfort of hydronic heat. But the way facility managers saw it, Prairie Meadows is home for 500-plus residents, where they seek comfort. Why shouldn't they experience a level of comfort too often reserved for people of greater means?

At Prairie Meadows, many of the occupants are families with children, though there are plenty of seniors, and those with physical disabilities, too. Apartments range from 850 to 1,000 square feet with one, two and three bedrooms.



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Started last year, 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 retrofit to all of the apartment buildings.

Work included door and window replacements, some new appliances, insulation, and some roofing. While the big, old cast iron boilers still worked, they were glutted for maintenance and natural gas.

Reynolds says it was decided that the old systems, while still in operating condition, operated at efficiencies of 65 to 75 percent AFUE. It's no mystery that a bump of 20 to 30 percent fuel efficiency caught the attention of managers tasked with planning the renovations.

### **Rigors of winter**

Another facet to the need for new boilers was their tendency—more frequently through the years—to require expensive or time consuming maintenance or service work, all too often during the winter months when down time meant real potential discomfort or trouble for residents.

For those who've never experienced winter at its worst in Minnesota, it's hard to describe the level of discomfort that can happen when a heating system won't work.

Roaring winds frequently sweep through the state, delivering an average of 170 inches of snow. Temperatures can reach -50F degrees, too cold even for ice fishing. And, try as it might, the state's travel bureau can't beat the stats: Their state is frequently rated by national weather services as the worst state in 50, winter-wise.

### **Importance of efficiency**

The state government has regulations and energy standards when it comes to building efficiency. They're slowly trying to switch everything to high efficient systems.

"The mechanical systems at Prairie Meadows—with gradually falling energy



efficiency measurements—no longer made the cut,” says 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. “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. It offers utility incentives and energy efficiency programs that are accessible to a wide variety of commercial and industrial companies, including financial incentives for upgrades and system-wide improvements.

## Comfort conversion

With efficiency being the No. 1 concern, Laars Mascot FT firetube boilers were selected for the retrofit project at Prairie Meadows. 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 new peace of

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mind during preparations for the inevitability of winter woes.

Associated Mechanical began their work in July, with work that kept them busy at Prairie Meadows 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: 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, inside sales at St. Paul, Minnesota-based Michel Sales Agency explains that the new boilers are wall-hung, which also saved space in the tight basement mechanical rooms. Piping was designed in a primary secondary fashion.

"Each apartment building now has two to three of the Mascot boilers," says 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."

Boiler operation is now controlled by outdoor reset, built into each boiler's circuitry. "This alone brought a whole new level of

comfort for residents of the apartment complex," Sundberg says. "Before, residents had one- or two-zone systems that simply operated by an 'on' or 'off' function. Essentially, it was either hot or cold. 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."

Laars Mascots were chosen for this job because it had standard features that weren't even options with other brands—like integral circulating pumps. "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," says Mike Jackson, Associated Mechanical jobsite superintendent. "So those advantages helped as system selections were made, as well." **MH**

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