

## Taco design software and LoadMatch® single pipe system win project for design-build firm

A new medical building outside downtown Buffalo includes a Taco LoadMatch® heating and cooling system that allowed an area design-build firm, MJ Mechanical, to win the project by providing a cost-effective alternative to a conventional 4-pipe fan coil system that proved too expensive for the owner's budget.

The three-story, 65,000-sq.-ft. Maxim Medical Center is an outpatient clinic facility focusing on cancer care, urology and imaging. It features state-of-the-art linear accelerators for advanced cancer treatment.

The original proposed HVAC system came in over budget by some \$1 million, which prompted MJ Mechanical's design-project coordinator, Drew Nowak, to propose a simpler, less expensive alternative that he had been first introduced to in 2007. His proposal centered on Taco's single pipe LoadMatch system, which requires less pipe, eliminates control



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sored gathering of design and project engineers held in Montana. At the work sessions the LoadMatch concept was introduced and LoadMatch system design was explored using the

Energy Research & Development Authority (NYSERDA) utility program.

Taco LoadMatch specialist Jeff Pitcairn prepared an initial system design for Nowak using the HSS software; Nowak then finalized the design, employing just over 100 LoadMatch circulators and McQuay fan coils, and added a thermal ice storage system to save additional energy. Nowak reports that the HSS design tool saved him almost 80 work hours or the equivalent of 2-3 weeks of design time on the Maxim Medical building project alone.

"Design-build projects typically go back and forth between the owners and the design firm, with multiple additions and deletions to account and adjust for. With HSS making those changes and recalculations is quick and easy. HSS is a lot more than just rendering parts and pieces on paper — the system demonstrates what the designer is thinking, where he wants to go with his design," said Nowak.

The Maxim Medical HVAC system consists of a primary (LoadMatch) loop and multiple secondary loops for the chillers, thermal storage banks and a fluid cooler. The main mechanical room is adjacent to the medical building and consists of two non-condensing Teledyne Laars gas boilers (million Btu each), a Liqui Chill liquid chiller and Taco-supplied

FI and KV pumps, 4900 Air Separators and two expansion tanks — one tank for heating and the other for cooling.

Outside the mechanical room are five Calmac thermal ice storage tanks holding a 40-60 percent glycol/water mix that is cooled down to freezing temperatures by the chiller overnight when electric rates are lowest. This eliminates the need to run the chiller during the day. The building's chilled water system is supplied during the day exclusively by the stored Btus in the storage tanks. Nowak says that the thermal ice storage systems pairs well with the LoadMatch pumping system.

Considering Buffalo winter weather there is a snowmelt radiant system in the immediate front entrance area, and the building's main lobby flooring is also radiant heated. A separate mechanical room inside the main building houses Munchkin boilers and related Taco equipment for the Watts-supplied radiant system.

Building construction, managed by Burgio Campo & Felice of Cheektowaga, N.Y., commenced in January 2008 and construction and mechanical crews worked straight through the winter to bring the building online and ready for occupancy last June. Nowak says that his firm's installers were putting up Victaulic pipe when the building was little more than a steel shell. The chilled water side of the HVAC system was commissioned last June and the heating side in October.

Nowak is sold on the LoadMatch system for future project applications. Being a young engineer he did not have to jettison a mindset averse to trying an unconventional system like LoadMatch. "Everything's new to me," said Nowak. "There's always a degree



Drew Nowak, MJ Mechanical's design-project coordinator proposed Taco's single pipe LoadMatch system for the Maxim Medical Center project. LoadMatch requires less pipe, eliminates control valves and reduces balancing valves to a minimum.

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The LoadMatch system is centered around small, low kW LoadMatch circulators. All loads in a LoadMatch system operate separately from one another, and the secondary flow that circulates through each terminal unit is independent of the system's primary distribution pumps. Because it eliminates all control valves and up to 40 percent of piping, first costs are reduced with a LoadMatch system. Lower pump head and operation of the circulators to match the load reduce operating and maintenance costs.

Nowak first encountered the LoadMatch system at a Taco-spon-

proprietary HSS software platform, which enables engineers to quickly lay out a complete hydronic system, making equipment selections and positioning/sizing everything from boilers and air separators to circulators and valves. Load calculations and schedules are automatically calculated by the software, saving engineers hours of design time over the same design accomplished by more traditional CAD drawing means.

The Maxim Medical project, Nowak felt, would be an ideal LoadMatch application that would still include fan coils but cut out a lot of the installation costs of a conventional 4-pipe system. Plus, it would help qualify for energy grants under New York State's



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of skepticism, for sure, with something you haven't used before, he added, "but if it works, and LoadMatch does, then why not use it?" ■