Références

Wilfred Laurier dorms



Implication d'Uponor

Project Highlights

- Hydronic system repipe for university residences
- Features Uponor PEX up to 3" transitioning from black iron pipe
- Flexible PEX proved to be advantageous in areas with spacing constraints

Products used

- ½" to 3" Wirsbo hePEX oxygen-barrier pipe
- ProPEX brass threaded transition fittings and flange kits for transition from black iron pipe
- Uponor PEX-a Pipe Support allowed for fewer hanging brackets and minimized pipe expansion

Tight spaces and timelines no longer a concern

See the advantages of converting from an electric system to an Uponor hydronic heating and chilled water...
Increases in energy costs are leading many building owners and facility managers to look for more cost-effective ways to heat and cool their buildings. Apartment buildings and student residences currently using electric systems are prime candidates for conversion to hydronic heating systems, and sometimes even water-based cooling systems.

Wilfred Laurier University, in Waterloo, Ont., opted to retrofit the electric heating systems in two of its existing student residences. The school went with hydronic heating and cooling for one of the buildings and hydronic heating for the other (which continues to use its existing forced-air DX cooling system).

Connaissance du projet

Location	Achèvement des travaux
Waterloo, Ontario, Canada	2016

Type de construction

Enseignement supérieur

Student residences get the hydronic treatment

The Bricker Residence

Located at 44 Bricker Avenue in Waterloo, the Bricker Residence is a nine-story apartment-style residence with four-bedroom suites that feature a common kitchen, bathroom and living room.

The project retrofit was designed to have fan coil units located in each of the suites, and a new piping system added to supply heating and cooling water in a two-pipe switch-over system.

The required flowrates for the fan coil units varied between 4.7 and 13.5 gallons per minute (gpm), and pipe size calculations were based on a Delta T of 10°F (-12°C) for the cooling system.

This particular building included new boilers and chillers and a main loop installed on the ground floor with the majority of the piping installed in the ceiling space of the main hallway.

Uponor PEX risers were installed between floors to connect to each of the fan coil units. The PEX pipe was sealed with a fire-rated sealant for all floor penetrations and through any fire-rated walls, and each floor and ceiling penetration included a pipe bracket to minimize pipe expansion between floors.

The Grand River Residence

The Grand River Residence is part of Laurier's satellite campus, at 171 Colborne St. in Brantford, Ont. It is a five-story building that houses 150 students. Residence rooms are located on floors three through five with classrooms and administrative offices on the first two floors.

This project was designed to have hydronic reheat coils added to the existing VAV boxes already installed in the offices, classrooms and suites while the existing forced-air cooling system was kept intact. Due to the configuration of the building and the various locations of the VAV boxes, each floor had its own main loop that was fed with larger-diameter risers.

Smaller-diameter Uponor PEX branched from the main loop on each floor to feed each of the reheat coils. These reheat coils varied in size and capacity to match each room's need.

Flowrates for the reheat coils ranged from 1.4 to 9.7 gpm, with a majority of the coils landing in the 2 to 4 gpm range. The system was designed using a supply water temperature (SWT) of 150°F (66°C) and a Delta T of 20°F (-6°C).

Tight timeframes and tight spaces

One of the key challenges with these projects was to have the installations completed during a four-month period (from May to August) when students were on their summer break. This left a very tight window to complete the projects; there was no room for possible delays or project extensions.

Due to the tight timeline, and the fact that these were both existing finished buildings, mechanical contractor Modern Niagara opted to use PEX piping instead of a rigid pipe system. There were a number of areas where space was limited for the installation of pipe, so the flexible nature of Uponor PEX tubing proved to be advantageous in those areas.

Uponor Design Services created the piping designs for each of the projects to ensure the pipe sizing and flow rates would meet with the engineer's original design calculations and requirements.

The project incorporated PEX sizes up to and including 3" diameter pipe with larger sizes being black iron.

Prior to the start of the PEX installation, Modern Niagara installers were trained by the rep agency, The Morgan Group, to ensure everyone was familiar with the use of Milwaukee® M18™ FORCELOGIC™ ProPEX® Expansion Tools. Modern Niagara was familiar with Uponor PEX pipe and ProPEX fittings from past projects, but this was the first project using larger 2" and 3" PEX pipe and ProPEX fittings.

The installers transitioned between black iron pipe and 3" PEX with brass threaded transitions and/or flange kits. Flange kits were also used for connecting the PEX pipe to some valves and circuit setters.

Most of the horizontal PEX installations included Uponor PEX-a Pipe Support to allow for fewer hanging brackets and to help minimize pipe expansion. By using the PEX-a Pipe Support, the installers were able to support the pipe approximately every eight feet.

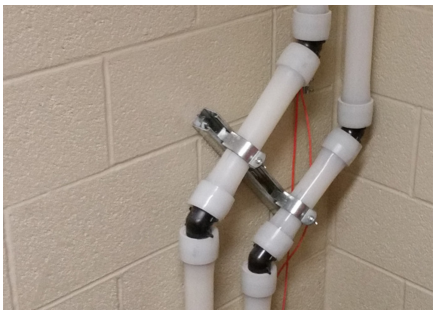
Where possible, larger connections were assembled at the bench level and final connections were made in the drop ceiling spaces and wall cavities. The majority of the 1" and larger pipe sizes used 10-ft. and 20-ft. straight lengths of PEX while the smaller pipe sizes connecting to fan coils or VAV boxes used flexible coils of PEX to minimize the number of elbows and other connections.

Upon completion of each installation, the system was filled and pressure tested to check for possible leaks, and the piping system was insulated before reinstalling the ceiling panels and sections of drywall.

Thanks to the ingenuity of the system design and the efficiency of the installation crews, both projects were completed on schedule and the buildings were ready for the fall semester of incoming students.

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