



aquatherm

Provide lasting pipe performance

ESTABLISHED CONTRACTOR USES PP-R PIPE FOR A/C RETROFIT ON 83-YEAR-OLD SCHOOL CAMPUS

PROJECT INFORMATION

PROJECT	PRODUCTS USED	LOCATION / DATE
University of Detroit Jesuit High School and Academy, HVAC	aquatherm blue pipe®	Detroit, MI Summer 2013

AQUATHERM ADVANTAGES

- The natural R-value and durability of PP-R eliminated the need for insulation
- Aquatherm's heat fusion installation reduced the installation from an estimated nine days to six
- The leak-free heat fusion joints and chemical resistance will guarantee peak performance from the system for decades to come



THE CHALLENGE

The supply and return lines between the school's boiler house and residence building needed to be buried directly in the ground, and traditional piping options were not optimal

THE SOLUTION

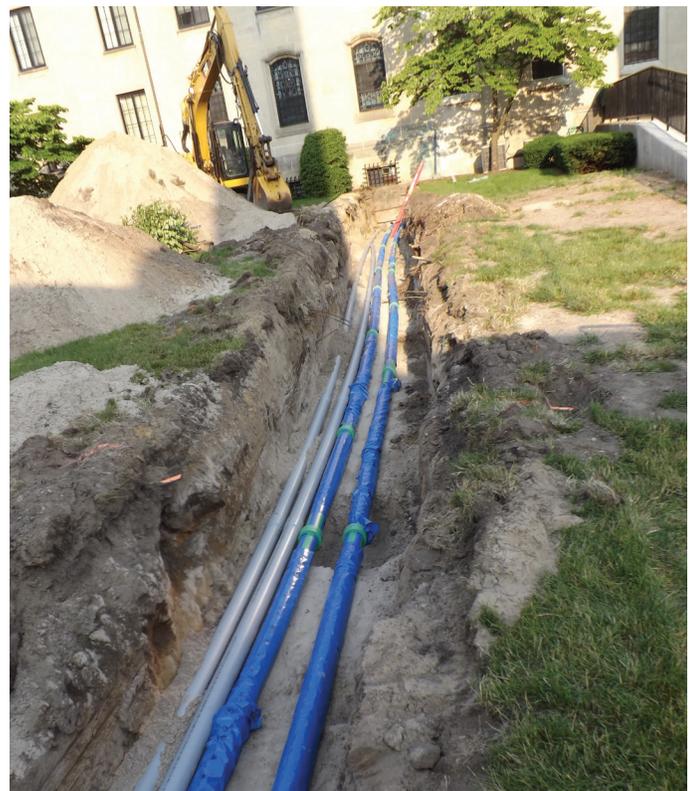
Aquatherm's polypropylene-random (PP-R) pipe enabled the team to install the lines in direct contact with the soil in less time than more conventional materials

John E. Green Company installs 21st century piping in direct-bury heat pump application at the University of Detroit Jesuit High School.

Located in inner-city Detroit, University of Detroit Jesuit High School and Academy was founded in 1877. The school has prospered through good times and bad by focusing on its founder's Jesuit values and preparing students to become community leaders. This commitment to academic excellence, faith, and service has drawn students from the Greater Detroit area and resulted in a stellar reputation. According to the school website, each member of the 2013 graduating class was accepted to a college of their choice, which included 19 Jesuit universities and four Ivy League institutions.

The majority of the current campus was built in 1930, and while staff considered leaving the urban site for a new building in the suburbs in the mid-1990s, the decision was made to renovate the existing campus. The 50,000-sq-ft residence building had originally served as the residence for the school's priests but now serves as counseling, meeting rooms and administration space.

A boiler house located 120 ft from the residence building originally contained a coal-fired boiler that served radiators



in the school. In recent decades, the boiler house was upgraded with more modern equipment, including water source heat pumps, while also being configured for future expansion.

SUMMER RUSH JOB

In the summer of 2013, the engineering staff committed to bringing a central air conditioning system to the main residence building. However, the timeframe to complete the job was tight, as construction couldn't begin until mid-June and needed to be finished by mid-August.

The school engineering staff called upon long-time mechanical services partner, John E. Green Company (Highland Park, MI), for design-build support. Director of Plant Operations at University of Detroit Jesuit (U of D), Bob Williams, worked closely with John E. Green's Mark Bobrowski, Senior Mechanical Engineer Preconstruction Services, to devise a



plan that would work for the historic facility. Bobrowski, a U of D alumnus, has provided engineering support for his alma mater for over 15 years.

Bobrowski has designed a huge variety of mechanical projects ranging from automotive process piping to hospitals and schools, and has spent the last 40 years working for John E. Green. The company was founded in 1909 and is consistently rated as one of the largest, most diversified, full-service, union mechanical and fire suppression contractors in the U.S.



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—BOB WILLIAMS, DIRECTOR OF PLANT OPERATIONS, U OF D, DETROIT, MI

When it came to the design of this project, the solution was pretty straightforward. Three new Daikin 2-ton water source heat pumps were installed in the residence building and tied in with existing valves in the boiler house. This new arrangement would supply the main residence building with heat pump water and also provide extra capacity for up to 20 new heat pumps in the residence building that will be adjoined to a new Science Wing addition scheduled to be built in 2014-15.

With the equipment decided upon, Bobrowski and Williams still faced one conundrum: the 4-in. supply and return lines running roughly 120 ft between the boiler house and the residence building needed to be buried in a new trench, and neither Williams nor Bobrowski were enthused about the traditional pipe options for this application.



"My concern was, with the pipe being in the ground and exposed to the elements, what would the life cycle of the pipe be?" Williams recalled. "Were we going to have to insulate it, or put it in a concrete chase or whatever, and Aquatherm came to the table and seemed to be the answer because we didn't have to insulate it."

SEEKING THE RIGHT APPLICATION

Bobrowski had been introduced to Aquatherm by Cindy Zatto with V.E. Sales Company, Inc. Based in St. Clair Shores, MI, V.E. Sales serves as the local Aquatherm manufacturer's representative and has built a reputation for thorough and exceptional support in several construction-related markets, with a specialization in flow control. Aquatherm is a polypropylene-random (PP-R) pipe system that has been used to solve plumbing, HVAC, and industrial pipe problems throughout North America for the last six years.

"Cindy had told me about Aquatherm and we were looking for the right application where we could use the product and check it out. On this job, it seemed like a great fit. You wouldn't put normal plastic pipe in the ground for this application – and I don't like putting pipe in the ground at all – but with this product I'm not worried about it."

One of the reasons Bobrowski and Williams were comfortable with direct-burying Aquatherm Blue Pipe® was the heat fusion connection method used to join pipe and fittings. The pipe and fitting are placed on a 400 - 500 °F iron and then connected. For typical 4-in. connections, the pipe and fitting are left on the iron for only one minute. This bonds the pipe and fitting at the molecular level without the use of chemicals or mechanical connections, and it eliminates systematic weaknesses and fail-points. The heat-fused fittings maintain the same properties as the pipe itself, so physical stresses will not compromise their integrity.

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- MARK BOBROWSKI, SENIOR MECHANICAL ENGINEER,
JOHN E. GREEN COMPANY, HIGHLAND PARK, MI

Several John E. Green installers participated in the standard Aquatherm training course conducted by Zatto, and the proper fusion welding equipment was rented. Once the trench was dug and the building penetrations completed, the crew began fusing 4-in. Aquatherm Blue Pipe. "We just basically threw it in the ground – I watched the guys do the installation and it was pretty slick," said Williams. "The guys who were doing it were brand new to the system themselves, but once they got a few fusion connections done, it went pretty good and quick, and I think we took several hours out of the job, because the installation went so well," he added.

SAVINGS ON MULTIPLE LEVELS

The quick installation time was important since the 6-ft-wide and 5-ft-deep trench was layered with sand and exposed



throughout the pipe-laying portion of the project. While the team had budgeted for the trench to be uncovered (and an excavator operator required onsite at his hourly rate) for eight or nine days, it only took six days. "If we had put steel or welded pipe in, it would have taken a lot longer. It went fast, faster than we were expecting," Bobrowski added.



Using Aquatherm in lieu of steel also presented savings since the former didn't require insulation. "Since it's heat pump water, it's not too hot or too cold and the pipe has some insulating value so we didn't need to insulate it in the ground," Bobrowski explained.

Despite this being the first experience with Aquatherm for both John E. Green and the school, the project came off without a hitch. "Initially it looked like it [Aquatherm] cost a bit more than steel pipe, but it fit the application and cost wasn't the first priority, but it was close," Bobrowski said.

GREEN TO GO WITH GREEN

Williams also liked the idea that PP-R is an environmentally friendly pipe option. "We always look to use green products, but at the same time that isn't our main concern because when you 'do green' oftentimes it costs you a lot of 'green' and we can't kill a project because of that. But we always look at ways of doing things green and obviously Aquatherm is a green product."

And since the new four-story Science Wing will be a showcase of state of the art, environmentally friendly products, Aquatherm is being considered for the domestic water supply and HVAC pipe systems. The fact that the products come with a 10-year multimillion-dollar warranty and that PP-R is not targeted by scrap thieves are other benefits that might factor into the decision.

With one successful job in the books, John E. Green also plans to use Aquatherm on other jobs for which it's a good fit. "I put this product in the ground and I'm not going to have to worry about it deteriorating or leaking. We even looked into whether we would be able to drive heavy equipment over it and that checked out okay too. I'm not a fan of putting pipe underground, but this was a good option," concluded Bobrowski. 

The German-manufactured pipe has been one of the world's most durable and greenest piping systems for four decades and proven successful in 70-plus countries. Aquatherm piping systems offer many performance and environmental benefits, such as:

- Eliminating toxic materials, glues and resins, and open flames from the piping installation equation
- An R-value of 1.4 per inch or greater depending on pipe size and SDR
- The fusion welding process, which creates seamless connections that last a lifetime without leaking or failing
- An optional fiber-composite layer in the pipe reduces linear expansion of the pipe by up to 75% compared to plastic piping

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