

Two-year-old CPVC Geothermal Pipe System Replaced with HDPE Pipe

Bowling Green, Kentucky

Background

Built approximately two years ago, the 380,258-square-foot South Warren School, located within Bowling Green, Kentucky, is one of the largest combined high school/middle schools in the state. The original design of the new school included a geothermal heating and cooling system that used CPVC as its piping material.

Geothermal energy is a safe and renewable energy source stored within the earth that can be used efficiently to heat and cool a building without harm to the environment. Due to a constant temperature within the earth, you can efficiently capture geothermal energy by creating a series of horizontal or vertical loops underground. The loops are filled with water, or water based liquid, and connected to a heat pump inside a building. The heat pump circulates the liquid through the ground loops creating a heat exchanger that is more efficient than any alternate heating or cooling method.

School Faces Leaky Pipes

Two years after the piping system was installed, the CPVC pipe began to fail. There were several sections of pipe that leaked, mostly along the pipe joints. The school needed to find a replacement piping system that could be installed relatively quickly and provide a long-term solution.



An example of the leaking CPVC pipe that needed to be replaced. This shows leaks around the joints.



An example of some of the prefabricated pipe sections provided by ISCO Industries to help speed up the installation process and minimize the amount of welds or fusions that needed to occur onsite.

Addressing Geothermal Supply Needs

Davis & Plomin Mechanical, Inc., the contractor hired for this project, decided to use high-density polyethylene (HDPE) pipe to replace the CPVC pipe. HDPE pipe is strong, durable, flexible and light weight. When fused together it creates a monolithic pipe system with a zero-leak rate. It is also non-toxic and corrosion and chemical resistant.

Davis & Plomin consulted with ISCO Industries' director of geothermal sales Mike Raider, geothermal sales representatives Tom Titus and Kevin Creek, territory service manager Bruce Thompson and large diameter sales manager Garry Bouvet to provide materials and services for the geothermal piping system.

ISCO Industries supplied more than three miles of ¾- to 12-inch HDPE pipe for this project that included fittings, transition fittings and fusion equipment. The fusion equipment consisted of a McElroy 28 unit, two McElroy socket kits, two McElroy sidewinders, a McElroy 26 unit, a McElroy 412 unit, as well as a Friatec processor. ISCO also prefabricated sections of pipe (spools) for the contracting company to help quicken the onsite installation. ISCO's representatives worked with the project's new contractor to make sure all geothermal system requirements were met.



The piping system is complex and runs through various sections of the school. This section or zone of the geothermal piping system now made of HDPE is located above the common kitchen and serving areas for the high school and middle school's cafeterias.

Installation

The CPVC pipe replacement project began after the close of classes for the summer on June 6, 2011. During a site visit by ISCO representatives to the school, the contractor pointed out the extensive nature of the new HDPE pipe system. One of the contractor's crew members pointed out some of the leaks from the old CPVC system, which still needed to be replaced. It was apparent that the Davis & Plomin crew was working quickly and was well on its way to completing the project early.

"There are six zones in the school. CPVC pipe in these zones is being replaced with HDPE pipe," said Phil Singer, project manager for Davis & Plomin. "Each of the zones feed into different parts of the school to provide heat and cooling air. All the zones will eventually feed into the main mechanical room, which is tied into the



A closer look at the complex nature of some of the sections of the piping system. This shows HDPE pipe already in place along with a McElroy fusion machine being used to fuse more pipe.

geothermal system."

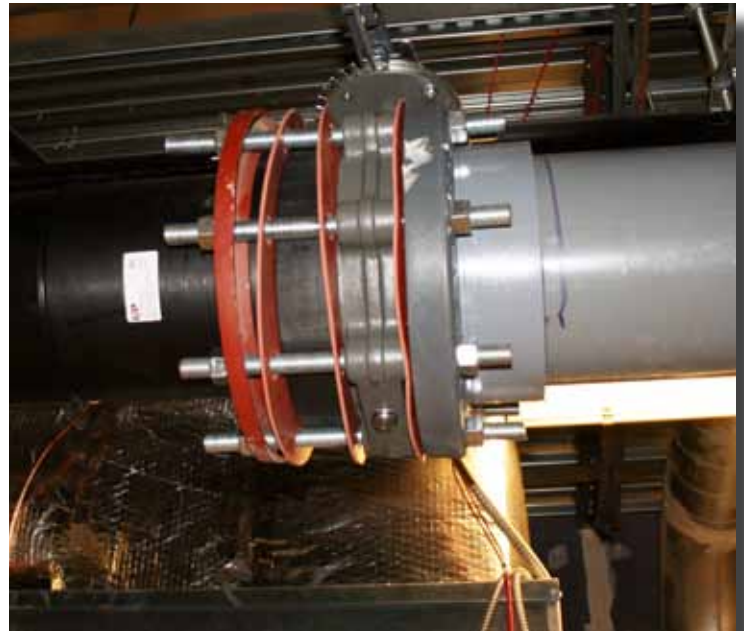
To replace the two-year-old CPVC piping system, the contractor needed to break through walls and parts of the ceiling to complete the work. In addition to installing the spool pieces prefabricated by ISCO, the crew also fused sections of HDPE pipe and fittings to install in all other areas of the school where CPVC was originally used.

Singer added that he was "confident that all the work will be completed ahead of schedule by the first of the year (2012)".

About ISCO's Geothermal Products and Services

ISCO Industries works with engineers, public utilities, installers, contractors, homeowners and business owners to customize geothermal systems to the customers' needs, offering both reliable and long-lasting products and services. ISCO offers HDPE pipe and fittings, prefabricated headers, the ISCO Circuit Maker Vault® as well as sand and grout for geothermal piping systems.

For more information on ISCO's geothermal piping solutions and geothermal Circuit Maker Vault® visit:
www.isco-pipe.com/markets/geothermal.aspx.



This view is of a transition from the old CPVC system to the new HDPE piping system that is replacing all of the CPVC pipe that had leaked after only being installed two years ago when the school was built.

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