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BUILDING COMMUNITY



- PRINCETON, ILLINOIS - SMALL CITY, BIG MODERNIZATION PLANS

Converting Overhead Utilities to Underground One Step at a Time with HDPE Conduit Using Horizontal Directional Drilling

PRINCETON, IL - For a city of some 7,500 residents, the future is now as it continues to modernize itself through a program that will eventually see all overhead electrical utility cables put underground. From the beginning of the program seven years ago until late in 2009 when cold weather conditions pre-empted additional work, miles of underground lines have been installed. The primary goal is safety. Going underground by using high-density polyethylene (HDPE) conduit pipe eliminates the need for crews to climb and trim tree branches that grow around the power lines. And there are other benefits for the picturesque and historical city.

“While some large and very abundant cities fear putting utilities underground because of unfounded opinions about cost, Princeton has embraced the idea,” stated Tony Radoszewski, executive director of the Plastics Pipe Institute (PPI). “Princeton is a small city with sharp thinking leaders, namely its civic officials and its electrical utility managers. They know that by burying power lines and at the same time planning for the expanding use of technology, Princeton will have a confident power grid for many generations.” Founded in 1950, The Plastics Pipe Institute Inc. (PPI) is the major trade association representing all segments of the plastic piping industry.

Located some 115 miles west of Chicago, Princeton’s motto is “Where Tradition Meets Progress”. Its utility conversion program is being done in small steps. “We try to do at least one project every year where we convert from existing overheads that end in an easement in a backyard,” said Jeff Mangrich, superintendent for the City of Princeton Electric Department.

The installation directionally drills the HDPE conduit in the ground. This method requires very little disruption of the surface, saving money and time that would be required to repair a large trench used to install pipe made from other materials.

“The reason we selected HDPE pipe is because we bore everything in,” he stated. “And we prefer not to do any open trenching because boring is so much less invasive. For some new developments and new construction sites, however, we choose between boring or cut and cover depending on whether or not we have a boring machine available. It’s also easy to fuse HDPE pipe in the trench.”



The City of Princeton is helping the environment while protecting its citizens. Putting overhead utility lines underground using HDPE conduit pipe reduces the need for the more than 800,000 wooden poles purchased by electric companies annually in the United States.

For Mangrich and his crew, the job is also easier and quicker because the pipe comes in coils so hundreds of feet can be installed without stopping, greatly increasing productivity. The length of the coil depends on the size of the pipe. For example, as much as 6,000 feet of two-inch diameter HDPE pipe can be delivered on one reel.

“The HDPE pipe also enables us to use one pull to put in three different sizes - one inch, two inch and a two-and-a-half inch,” Mangrich explained. “The two inch is used for primary conductor; the two-and-a-half is used for secondary conductor; and the one inch is for future fiber and is empty. This is all done in the same bore. We use a six or eight inch back reamer and pull them all



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at the same time. This year we also installed some four-inch diameter conduit. Basically what we're doing is using the HDPE conduit to cut its own the pathway in the soil." The electrical cable is then pulled through the conduit.

Blue Diamond, LLC (Lexington, KY), a PPI member company, manufactures the HDPE conduit pipe used for Princeton's modernization. The conduit pipe has pre-installed pull tape, which makes it easy for Mangrich's crew to run the power cables.

The conduit is RUS/USDA listed and meets all ASTM specs for SDR, SIDR and NEMA rated duct. It is also listed to UL 651 for the protection of cable and wires. The pipe's high tensile strength-to-weight ratio, superior crush resistance and low coefficient of friction for cable installation makes it preferable for directional boring.

The main power line is generally run under the backyard of a house. The service line is run underground to the house with the homeowner paying an electrician to make the connection.

Safety, Security and Eye Pleasing

Aside from providing the citizens of Princeton with a state-of-the-art utility system, Mayor Keith Cain knows the disappearing power lines reduce eye-pollution. "Our population loves the idea," he said. "As we continue to bury underground services, they get even happier because they like the improvement in how their community looks. We all want Princeton to look clean, and carefree. No one wants the poles and the wires sticking up through the trees throughout our community."

Mayor Cain, who started the overhead to underground conversion during his early years as mayor, also realizes the other benefits.

"We look at in the long range," he explained. "Because we're eliminating the overhead lines, we don't have near the maintenance or the downtime due to ice storms, strong winds or other severe weather events for example. So as we gradually proceed on this project, I see a lot of cost effectiveness. There is an upfront cost, but in the long run it will end up paying for itself and will give better service to our customers. That's the main thing. We want to and must serve the public. What we're looking for is zero outages. That's important to residents and critical for our businesses.

"By going underground," Mayor Cain continued, "and using HDPE pipe it's definitely improving the quality of life. We also use HDPE pipe in storm sewers and for potable water service lines for many of the same reasons."

"Putting utility wires underground is a practical and necessary thing to do," summarized Radoszewski. It eliminates interrupted service due to weather or accidents such as a car hitting a pole. Plus it protects workers and citizens. HDPE conduit helps to preserve and protect a community. And on the 'green side', it saves the community's beautiful trees and eliminates the need to cut down others to make the many wooden poles that rot and crack and fall across the roads. Electrical co-ops in the United States purchase nearly 800,000 wooden poles each year. There are also many favorable environmental aspects of pipe made from HDPE including how it can build a long-life system. It is truly a sustainable and environmentally responsible choice for the nation's infrastructure."

For additional information and technical literature, go to: www.plasticpipe.org.

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About PPI

The Plastics Pipe Institute, Inc. (PPI) is a Texas-based, non-profit organization, founded in 1950, that is the major trade association representing all segments of the plastic piping industry. PPI is dedicated to expanding awareness about plastic pipe systems and promoting plastics as the material of choice for pipe applications. It is the premier technical, engineering and industry knowledge resource that publishes data for use in development and design of plastic pipe systems. Additionally, PPI collaborates with industry organizations that set standards for manufacturing practices and installation methods. For more information about PPI and available information, go to: www.plasticpipe.org