

Fusible PVC, Prechlorinated Bursting Offer Unique Solution For Florida Water Project

by Jeff Griffin ■ Senior Editor

Replacing deteriorating water pipe with new prechlorinated pipe installed by pipebursting continues to attract interest of operators of water utility systems and the engineers who plan and design potable water projects.

Installing prechlorinated water pipe (pipe that is disinfected before being placed in the ground) has been common in Europe for many years, but is not widely used in the United States. The most enthusiastic proponents of prechlorinated pipe construction say the technology could substantially change traditional water construction in the United States.

An important advantage of the procedure in Florida – where most prechlorinated pipebursting projects in the U.S. have occurred – is that the state of Florida classified replacement of old water pipes by pipebursting as rehabilitation rather than new construction, allowing prechlorinated pipebursting installations without a new construction permit. Advocates say that this, along with other benefits of the technology, reduces time required to complete an installation and begin delivering water to customers.

Most prechlorinated pipe installations have used HDPE pipe, and the reluctance of some system owners to introduce HDPE into their systems may have discouraged consideration of prechlorinated pipebursting installations. However, restrained-joint PVC water pipe and fusible PVC pipe make it possible and practical to install PVC with the trenchless procedures of directional drilling and pipebursting.

Test project

In Florida, the water division of Orange County Utilities recently completed a project to test the feasibility of using fused prechlorinated C-900 PVC pipe. The test project was in the Orange County community of Windemere for the replacement of 2,000 feet of 8-inch-diameter asbestos cement water main with prechlorinated fusible PVC pipe of the same diameter.



For Orange County, the project is the second installation of prechlorinated water pipe using pipebursting. Pipe in the earlier project was HDPE.

“We wanted to determine whether the procedure would work with fused C-900

PVC pipe,” said Bob Dudas, distribution section manager for the water division of Orange County Utilities. “The majority of the distribution piping in our system is PVC, and our personnel are more familiar with the product and working with it.”

The county is pleased with the project results and the technology’s potential for future replacements.

“It worked great,” Dudas said. “We put 2,000 feet of pipe in the ground and placed it in service in only four days with minimal customer inconvenience and restoration requirements. The method saved both time and effort, and we already have another prechlorinated pipebursting installation scheduled.”

The project contractor was Murphy Pipeline Contractors Inc., Jacksonville, FL. Supervising the job was company President Andy Mayer, recognized as one of the world’s leading installers of prechlorinated water pipe by pipebursting. A HydroBurst HD5058 static bursting system from Hammerhead was used for the installation. Underground Solutions, Sarver, PA, supplied fusible C-900 PVC pipe.

Four installations

To complete the project, four pipebursting installations were made: one of 392 linear feet; two of 508 feet; and one of 546 feet (remaining portions of the 2,000 feet of pipe purchased for the project were used making reconnection stubs).

The first was one of the 508-foot segments which served eight residences along a residential street. The first step was fusing all four segments using a modified McElroy T500 fusion machine equipped with a data logger. Forty one fusion welds connected 39-foot-long joints of PVC pipe into the four strings of pipe to be installed. The fusion process required approximately two and one half days.

Fusion completed, Murphy Pipeline crew members capped and filled the segments with water, and Orange County personnel disinfected the later lines using hypo-chloride solution of at least 25 mg/L. During the disinfection process, an above-ground pressure test was performed on

each pipe section at 150 psi for two hours. Performing above ground pressure testing methods eliminated the need for temporary services after installation.

On the morning of the first installation, entry and exit pits were dug, and Orange County water division crews isolated the line and removed service to the homes served by the line being replaced. Bursting rods were inserted through the existing pipe. Installation of the capped and plugged fusible PVC pipe began at about 11 a.m. and was completed by 2:30 p.m.

The HydroBurst HB5058 system produces 50 tons of pulling force. The bursting head is attached to the assembled string of rod, and replacement pipe is connected to the tail of the tool. As rod is pulled toward the exit pit, the head bursts the old pipe while simultaneously installing new pipe.

With the new segment of pipe in place, it was super chlorinated, flushed, and Orange County personnel tied in branch lines and reconnected services. The rehabilitation process was complete and customers had water service by 5 p.m.

The basic procedure was the same for installation of each of the other three segments with each being completed in one day. Mayer says there were no unexpected problems and no overtime costs incurred. No customer was without water for more than eight hours.

New but growing

The Underground Solutions DR18 Fusible C-900 pipe used on the project is relatively new to the industry.

More than five years was spent in its development, and the product has quickly become accepted for direct burial, horizontal directional drilling, sliplining and pipebursting projects, says Tom Marti, vice president of engineering services. More than 100,000 feet of Fusible C-900, Fusible C-905 and Fusible PVC pipe has been placed in service since late 2004.

"Fusible PVC pipe is especially well suited for trenchless installation methods, providing fused, gasketless, fully-restrained joints," says Marti.

The pipe is available in diameters from 4 to 48 inches.

Proponents of installing prechlorinated pipe by the method of pipebursting say advantages include greatly reducing the amount of excavation and surface disturbance when replacing old pipe, less risk of damaging existing utilities during construction, and the capability of upsizing pipe in a system (in Florida upsizing of two pipe sizes larger than existing pipe is allowed). These benefits and other factors, say those promoting the technique, greatly reduce the time needed to complete an installation and to restore a system to service to deliver water to customers.

Murphy Pipeline's Mayer has installed more than 1 million feet of pipe by pipebursting in Ireland, England and the U.S.

About half the total has been for prechlorination projects. Mayer says 99 percent of his pipebursting work has been to install HDPE, but he recognizes several advantages offered by fusible PVC.

"It is seamless, very flexible, easy to work with, and most cities have a supply of fittings to accommodate good flow rates and higher pressures," he says. "This could be the biggest development ever for pipebursting water projects in the U.S."

FOR MORE INFORMATION

Pipebursting equipment:

Hammerhead, (800) 331-6653, www.hammerheadmole.com

Fusible PVC pipe:

Underground Solutions, (724) 353-3000, www.undergroundolutions.com

Fusion equipment:

McElroy Manufacturing, (918) 836-8611, www.mcelroy.com