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Pipe Bursting

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PIPE BURSTING

THE NEED

The underground infrastructure in the United States is huge. Much of it is at the end of its life cycle and needs to be renewed or replaced. Since most of the underground infrastructure has been in place for decades, streets, sidewalks, landscaping, even buildings have been layered on top of the underground pipes. Replacement by open trench construction will be very disruptive because of the congestion and development that has to be "peeled off" to expose the pipe and then put back in place.

FIGURE 1 PIPE BURSTING

THE TECHNOLOGY

Pipe bursting can be used to replace pipes without using open trench methods. Pipe bursting is accomplished by pulling a bursting device through the existing pipe. This device by virtue of its size or its radial expansion ability (depending on the type) shatters the old pipe and forces the fragments into the surrounding soil. The new pipe is usually attached to the bursting device and is thus pulled into place as the device advances.

Pipe bursting is receiving more and more attention as a viable alternative to open trench replacement. Pipe bursting can be used for pipes ranging in size from 2 to 30 inches and new bursting tools and techniques are being developed that will increase

the upper limit to four and even five feet. The process can be used on pipes made of cast iron, thin wall steel, concrete, clay, asbestos, PVC and polyethelene (PE).

FIGURE 2 OLD PIPE IS SPREAD TO MAKE ROOM FOR THE NEW PIPE

THE BENEFITS

Pipes can be replaced without digging a trench. This saves time and money and minimize disruption. The old pipe is left underground eliminating the need for its disposal.

STATUS

There are many variations of pipe bursting available: CSR Pipeline Systems uses a method dubbed "IMPIPE™" which actually uses a crushing cylinder that is slightly larger than the old pipe. Several blades extend radially from the center of the crushing head to the cylinder. These blades shatter the original pipe and cause it to "implode" (hence the name). The cylinder is followed by a bullet or cone which forces the fragments into surrounding soil and pulls in the new pipe. This method is advantageous because it minimizes or eliminates damage to laterals by simply cutting by them. The IMPIPE method was recently used successfully to replace 20,000 linear feet of 8 to 12 inch concrete pipe for the city of Houston.

PIM Corporation offers a method called ConSPLIT. This technology is specific to steel pipelines. The tool contains scoring wheels, a cutting blade and a spreader. The existing steel pipe is scored, cut and spread apart rather than shattered or otherwise destroyed. Space is thus created for the new pipe (typically PE) which is pulled into place behind the ConSPLIT tool.

Tracto-Technik offers another type of pipe bursting: GRUNDOCRACK a bladed cutting head on a soil displacement hammer to break up old and irreparable pipes made out of cast iron, thin-wall steel, concrete or clay.

BARRIERS

Current codes and standards may not allow pipe bursting as an option. Another barrier common to many trenchless technologies is insufficient knowledge and knowledge transfer.

POINTS OF CONTACT

PIM Corporation, Federal Highway Administration

Tel: (732) 469-6224. Fax: (732) 469-8959

CSR Pipeline Systems.

Tel: (800) 511-1488. Fax: (281) 874-0962

Tracto-Technik (TT Technologies Inc.)

Tel: (800) 533-207. Fax: (708) 851-8299

REFERENCES

1. "Future breakthroughs in the gas industry are happening now at Foster-Miller." Pipeline and Gas Journal. April 1995. p 42-46.
2. Tracto-Technik Home Page (www.tttechnologies.com)

REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

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