# More than a machine

Patented technologies can pave the way to bigger and better things, but training and knowledge remain key for the successful execution of HDD drives

*In 2013 in Germantown, Tennessee, a contractor installed 1,900ft of 12in PVC pipe at 0.22% grade and 15ft deep*

Current horizontal directional drilling (HDD) equipment manufacturers are building high-quality machines but, without proper drilling fluids and improved methods, the machine is only a machine.

The development of the Close Tolerance HDD (CTHDD) method gives operators the ability to control line and grade, not just for gravity sewers, but for all HDD installations. Improved tool designs and training for CTHDD means that sewer-installation and water-construction projects will meet or match current open-excavation specifications.

Open-excavation contractors adding HDD to their services are concerned to reduce the risks attached to the practice. CTHDD reduces the risks of HDD, but contractors are slow to change. To increase the market acceptance of CTHDD, Trenchless Flowline turned to pipeline owners and engineering firms to encourage them to change their planned open-excavation projects to CTHDD.

CTHDD is also causing existing HDD large-diameter pressure pipe projects to be revised with shallower (more serviceable) depth without voids or a build-up of fluid pressure.

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## STARTING IN ST LOUIS

St Louis Metropolitan Sewer District in Missouri (US) liked the idea of using HDD equipment over existing open-excavation methods to install its sewer mainline pipe, but it wanted to have a way of knowing that the pipe would be on line and on grade before it was installed.

*Drilling vertical holes for a CTHDD project*

Ted Dimitroff, president of Trenchless Flowline, applied for a patent on the process of drilling vertical sight-relief holes every 20 to 50 feet (6.1m to 15.2m) down to the pilot-stem depth and physically checking the line and grade of the pilot stem using an above-ground laser.

All engineering firms that were consulted agreed with the technique of physically checking the pilot stem and approving the line and grade before pulling the pipe into place.

A patented improved method of pipe pulling is the other major benefit to the CTHDD tool package. The improved method separates the back reamer from the pipe pulling head. This separation allows the new pipe to be installed within a back-reamed hole only 0.25in to 0.5in (6.35mm to 12.7mm) larger than the pipe's outside diameter.

This tight-tolerance back-reaming process prevents pipe flotation and movement. Even the pilot bit is only 0.25 to 0.5in larger than the beacon housing.

## GAINING MOMENTUM

Acceptance of CTHDD has been strong in some US states, but Florida is the most positive. Dimitroff worked for many years in Florida developing tools to control the pilot stem when drilling in sandy soils with a high water table. To install gravity sewers, contractors needed the perfect tool to get rid of the effects of gravity on the pilot stem. Dimitroff has developed the tools and process needed to control the pilot stem and he was recently awarded the patent.

Over the past 14 years more than 60,000ft of tight-grade sewer projects have been completed using CTHDD. The deepest installation using this method was in Cleveland, Ohio, at 42ft deep. The largest were a 24in Hobas sewer and a 36in reinforced-concrete storm sewer.

One project in 2002 in Baton Rouge, Louisiana, comprised the installation of 900ft of 12in North American Specialty Products Certa-Lok locking-joint PVC at 0.28% grade and a depth of 15ft.

In 2013 in Germantown, Tennessee, a contractor installed 1,900ft of 12in CertainTeed Green

Line Locking joint PVC at 0.22% grade and 15ft deep. Both projects met the open-excavation specifications of line and grade.

## ENSURING SUCCESS

The method is never guaranteed without skilled manpower. Since the inception of CTHDD, many on-grade HDD projects (flat grades below 0.5%) have failed.

Recently, a company in Australia tried to use this method without the proper tools and training and did not succeed. Training and tools are necessary to get the best results and it takes only two weeks to learn the method and how to use the tools – any contractor can consistently install tight-grade gravity sewers using their existing HDD rig.

Like any other technology, CTHDD comes with a learning curve. Building tools quickly (most right on the job) to correct problems in the early years was an asset. The biggest learning curve was handling sandy soils with difficult water tables. Again, tool designs were quickly developed and CTHDD can now work within the water table and sand or soft soil without having to dewater.

*Trenchless Flowline work site in Baton Rouge, Louisiana*

The HDD industry has no consistent method of installation or training like the pipe-bursting and cured-in-place pipe trenchless methods. That is where CTHDD comes into play, offering a consistent method of installations via tools and training.

## About the author

Ted Dimitroff, president of Trenchless Flowline, has over 30 years' experience in the oil-and-gas pipeline and utility-construction industry. He founded Trenchless Flowline in 2001 as an HDD contracting firm with multiple-size HDD rigs.

In 2003 after being awarded his first patent, he turned his focus to developing new HDD methods and tools for the sewer and water-construction industry. He has been awarded seven patents worldwide; all related to HDD and the sewer and water trenchless-construction industry.

Over the past 10 years he has been carrying out paid demonstration projects to test and develop CTHDD tools and methods. The funding from demonstration projects was used to pay for legal fees associated with patents, as well as to build and test new tool designs. Trenchless Flowline has over 100 new HDD sewer and water-construction tool designs, all field-tested and ready for market.

Ted Dimitroff is turning his focus on manufacturing and selling select tools designs to the existing HDD market and offering special tools and training of CTHDD in the US and selected overseas locations.