

Static Pipebursting & PVC Team Up For An Industry First In Utah

Water is a highly valued commodity in Utah. The state is second only to Nevada for the dubious honor of the least amount of annual rainfall at a meager 13 inches of precipitation per year. Irrigation and water management has been an essential part of life in this section of North America for hundreds of years. Simple irrigation canals have been discovered in this area that date back to pre-historic times, well before the discovery of the "New World." While the practice of water management has advanced with technology, the concepts behind it remain very much the same: conserve and manage the water supply while serving the people, agriculture and industry.

That management includes providing and maintaining the proper infrastructure to handle the job. That also means replacing it when it becomes old, deteriorated or outdated. That was the situation recently in Ogden, UT.

The Weber, Box Elder Conservation District is the irrigation water supplier for Ogden City residents. Most of the district's existing infrastructure consists of steel main lines, many over 50-years old that are in need of replacement. According to Claude H. Nix Construction/Jasco Inc. Pipebursting Division Manager Jay Garrett replacing those lines is not always easy.

"Often those mains run through areas that make replacement very difficult," Nix explained. "The line that was replaced in this project was an eight-inch line running through a narrow park strip. The line was over 60 years old and less than five feet deep. Our job was to replace the eight-inch steel line with a new eight-inch PVC line. The Weber, Box Elder Conservation District accepted our bid to replace this line using pipebursting to see how it would perform in a tight, landscaped area."

Garrett turned to pipebursting specialist Jim Moore from trenchless equipment manufacturer TT Technologies, Aurora, IL, for technical support. He said, "There were important aspects to this project, one of which was the choice of product pipe. This was the first pipebursting project that utilized CertainTeed Certa-Lok restrained-joint PVC. It is a significant step for pipebursting and for the product pipe industry. It expands the capabilities of both products and gives municipalities and project owners another choice when it comes to replacing deteriorated infrastructure."

A Grundoburst 400G static pipebursting system from TT Technologies was chosen

to burst and replace the existing steel irrigation mains.

Contractor & pipe

Over the past 30 years, Claude H. Nix Construction/Jasco, Inc. (CNC) has grown to be one of the leaders in providing solutions to difficult piping projects in Utah, southern Idaho and southwestern Wyoming.

CNC President Stephanie Nix said, "We focus on investigating new technology and using the best so we have the right tool for the job. We provide our customers with fair and complete bids, and work independently and professionally once we are on the job. We are in business to provide our customers with the quality installation of underground water, sewer and storm drain pipelines using the best construction technology available."

According to Moore, product pipe material selection can sometimes be a volatile subject. "It has been a stumbling block. Many utilities are so invested in certain pipe materials that it is almost impossible for them to consider using other types. While there is a high level of familiarity with the application of HDPE pipe in pipebursting, there is still considerable interest in other pipe materials by owners, engineers and contractors," he said.

Pipe manufacturers, like CertainTeed, are working diligently with pipebursting equipment developers and manufacturers to find real world ways to adapt their pipe products to the rigors of pipebursting installations. It takes the extensive experience of these parties to find suitable ways to install these pipes through the pipebursting process. It is very much a collaborative effort, like the project in Ogden."

Steve Gross, director of marketing for CertainTeed's Pipe Group, believed Certa-Lok Yelomine was an excellent choice for this pipebursting application.

"Yelomine pipe is made of modified polyvinyl chloride, which provides improved mechanical properties, higher pressure ratings and better flow performance than other thermoplastic materials," Gross stressed. "Plus, it will allow the district to stick to a proven long-lasting material that works seamlessly with existing infrastructure."

Gross also noted that Yelomine is easy for contractors to work with due to its unique spline-locking system that eliminates the need for fusion equipment, saving time and money, and the need to string-out hundred of feet of preassembled pipe, which may not fit in congested areas.



The CNC crews utilized the Grundoburst static pipebursting system that allowed them to use a restrained joint PVC product pipe. The Certa-Lok Yelomine PVC pipe assembled easily as the bursting operation proceeds, without the need for special fusion equipment.



The Grundoburst's specially designed bladed rollers makes bursting difficult host pipe like ductile iron and steel possible. In this case, CNC crews replaced 1,300 lf of 8-inch steel irrigation main with the static system.



Quicklock bursting rods are linked together, not screwed together, like traditional drill stems or other static systems. This system speeds the installation process as well as the breakdown procedure. The rods can be quickly removed one at a time at the exit pit as bursting is in progress.

On the job

With all of the components of the project in place, work was ready to begin on the irrigation pipeline. Because of the lack of rainfall, many areas employ a dual water system as a means of conservation. With a dual system, one system is dedicated to potable water, while the other carries water that is used for irrigation, as well as commercial and industrial applications. Moore

said, "This type of secondary non-potable water system is typical of the area. Basically, residents use the system for caring for their lawn and gardens during the summer. It's also used for agricultural irrigation. In the winter, the lines are drained and shut off. This particular steel line, which was used for irrigation, was in pretty bad shape."

Added Garrett, "There were over 63 point repairs in the 1,000 feet that was to be replaced. The preparation was time consuming due to the number of service connections to the homes in the area. Most were put in after the irrigation line and some were in direct contact with the old pipe. There were four tees that needed to be cut into the new line, so a pit was set up at each of these locations. Approximately 1,200 lineal feet of the 1,300 total feet was installed using pipebursting. Two road crossings were constructed by directional drilling and 60 feet was installed open cut."

CNC crews divided the 1,200 feet of pipebursting into four runs. Not only did crews contend with tight working conditions, but traffic was also a concern because of an elementary school a few blocks away from the work site. Because these irrigation lines are drained and shut off in the winter to prevent freezing, the lines are set only a few feet below the surface. Launch and exit pits were typically four feet wide by 10 feet long by 3½ feet deep.

According to Garrett, crews also saved space by utilizing the PVC pipe. "We used Yelomine Restrained Joint PVC pipe which meant that we didn't have to contend with

450 feet of fused pipe crossing driveways and streets while we were bursting. That helped with space issues. We also needed to make sure to secure the potholes because of the close proximity to the school. And we paid very close attention to the adjacent utilities."

Working through challenges

Moore pointed out that the CNC crews handled the adversity well. He said, "Probably the biggest challenge the CNC crew faced on the project was with other water lines and gas lines that in certain areas were literally sitting right on top of the steel main we were replacing. In some instances, a loop was placed on the line to provide more room for bursting and in other cases we slowed the bursting process down and monitored the area closely to make sure we could make it through. This is a huge advantage to the static bursting process – the ability to manage your speed."

Once the launch and exit pits were established and the adjacent utilities and services potholed, the Grundoburst hydraulic pulling unit was placed in the exit pit. The crew then rodded the existing line with the Grundoburst's Quicklock bursting rods. Once at the launch pit, the roller cutting blades, bursting head, expander and first section of PVC were attached, and pullback was ready to begin.

Moore said the bladed rollers are key to pipebursting steel. "During the static bursting process, specially designed bladed rollers are pulled through an existing line by

a hydraulically powered bursting unit. As the bladed rollers are pulled through, they split the host pipe. An expander attached to the rollers forces the fragmented pipe into the surrounding soil while simultaneously pulling in the new pipe.

"The bladed roller configuration is an essential part of the Grundoburst's success. The specially designed bladed rollers actually split the host pipe instead of ripping or tearing it. This is a clean process and prevents potential damage to the product pipe."

Average bursting times for the CNC crew ranged between one hour and 1 ½ hours per 300- to 400-foot runs. After a bursting run was completed, crews would immediately start tying back in the services to the new PVC main and restoring the launch and exit pits.

Everyone involved considered the project a great success. "There were several challenges on this project and several successes. It was very difficult to get around those tight utilities. But it was exciting to be able to use a new product pipe in the restrained joint PVC. In the end it was great job all the way around by the Nix Construction crew," Moore observed.

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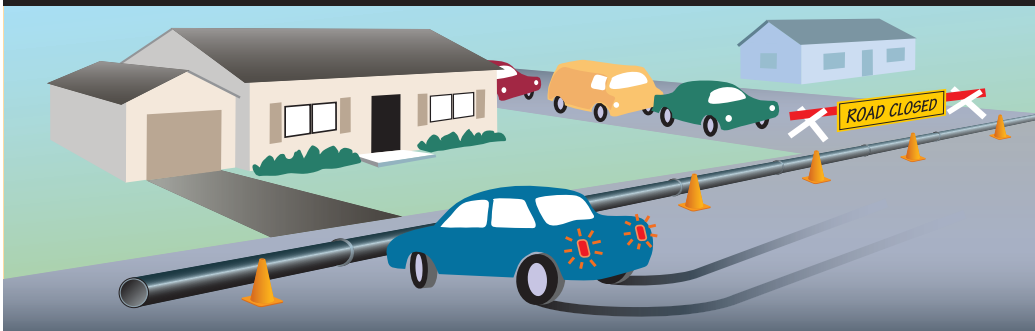
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