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PVC Pipe *And* Trenchless Construction

Water main replaced without major disturbance

Earlier this year, the Saginaw Charter Township Office of Public Works had a dilemma – how would they manage replacing an entire water main in a busy part of town without causing a big disturbance? The water main that needed updating paralleled major thoroughfare Gratiot Road, the four-lane in-town portion of M-46, and serviced an affluent area surrounding the busy road.

“The area we were going through included the frontage of a high-end golf course and many upscale homes,” said Brian Poultney, designer for Spicer Group, consulting engineers on the project. “We wanted to keep things as tidy as possible, and didn’t want to have big dirt piles lying around.”

The proposed water main would replace a previous line that was in a loop with many other mains throughout Saginaw Charter Township. It served both residential and commercial customers, including direct connections to 40 individual homes and connections to five other existing water mains.

Originally, the water main replacement was bid on as an open trench project. Saginaw’s Rohde Brothers Excavating, Inc. was awarded the job. Rohde Brothers found that on this project, they could go trenchless for about the same price and could probably even save money. Even better, using the horizontal directional drilling (HDD) method would help avoid major traffic disturbances common with open trench projects.

“The volume of traffic that uses Gratiot Road daily was a major reason for our

decision to bore this project,” said Brian Rohde, vice president of Rohde Brothers. “By using the directional bore technique, we would be able to minimize our effect on traffic to only one lane. This allowed traffic to continue unimpeded, whereas an open cut project would have caused a major traffic flow interruption to occur.”

Saginaw Charter Township had never used the trenchless method before, but under the circumstances, officials understood how directional boring would be to their benefit.

“Directional boring definitely has its applications, especially in a high traffic residential area where water main replacement is necessary,” said Saginaw Charter Township water



A worker ties a nylon spline to a section of Certa-Lok restrained joint pipe, preparing it for installation.

distribution technician Eric Schiesswohl. “It keeps the disturbance of properties down to a minimum.”

Spicer Group accepted CertainTeed Certa-Lok™ C900/RJ pipe for the project. Certa-Lok, a high-performance polyvinyl chloride (PVC) restrained joint piping product, was chosen mainly because Saginaw Charter Township has used C900 pipe since the 1980s. A worker can easily assemble Certa-Lok with no special tools, using a high-strength nylon spline to tightly lock the pipe and coupling together. Because of this, the pipe will not come apart when pulled through the bore by the directional drilling machine.

Project: Water main replacement in Saginaw Charter Township
Contractor: Rhode Brothers Excavating, Inc., of Saginaw

“It installed very easily, and the pipe pulled and went together very well.”

– Saginaw Charter Township water distribution technician Eric Schiesswohl

The Saginaw Charter Township Public Works Department also preferred Certa-Lok because it can be repaired easily, Poultney said.

"The Certa-Lok pipe is easy to repair because you can use conventional repair components the township already has in stock," Poultney said.

Certa-Lok can be successfully used in both trenchless and open trench projects. In open trench, the restrained joint pipe eliminates the need for traditional open trench components such as concrete thrust blocks.

Construction began in mid-June, with a crew of four working on bore operations and two to four more workers in charge of locating existing utilities. The latter crew installed hydrants and valves into the water line. The main called for 5,100 feet of 12-inch Certa-Lok C900/RJ, with 6- and 8-inch C900/RJ pipe to be installed in a small open-cut operation for fire hydrant leads and to connect to the other existing mains. Certa-Lok's UL and FM approval for fire-protection systems made it the perfect choice for this application. Water services were 3/4-inch to 2-inch copper.

The drilling crew made 16 separate bores, which ranged from 80 to 450 feet long, depending on the distance between proposed connections to existing mains and hydrant locations. Bore depths ranged from 7 to 9 feet. The crew used a Vermeer D24x40A drilling machine with 24,000 pounds of pullback to make the bores, as well as a Komatsu PC128UU mini-excavator, a Case 590 Turbo backhoe and a tandem dump truck for the various digging and hauling portions of the job.

The crew drilled through brown clay. After each initial bore was made, the restrained joint pipe was pulled in 20-foot lengths behind a back reamer, which enlarged the bore to make room for the pipe. After installation, the 5,100-foot run of PVC passed pressure testing on August 5. The remaining portions of the job were completed by mid-September. Saginaw Charter Township was pleased with the trenchless method of pipe installation, and has since chosen to use it on a few projects coming up in the near future. The Certa-Lok pipe worked out well, too.

"It installed very easily, and the pipe pulled and went together very well," Schiesswohl said. "Everything turned out just as we planned. We haven't had a problem so far and we haven't had any leakage either."

All in all, the project ran smoothly, and the crews received no complaints from neighbors or Gratiot Road motorists, Poultney said. ■

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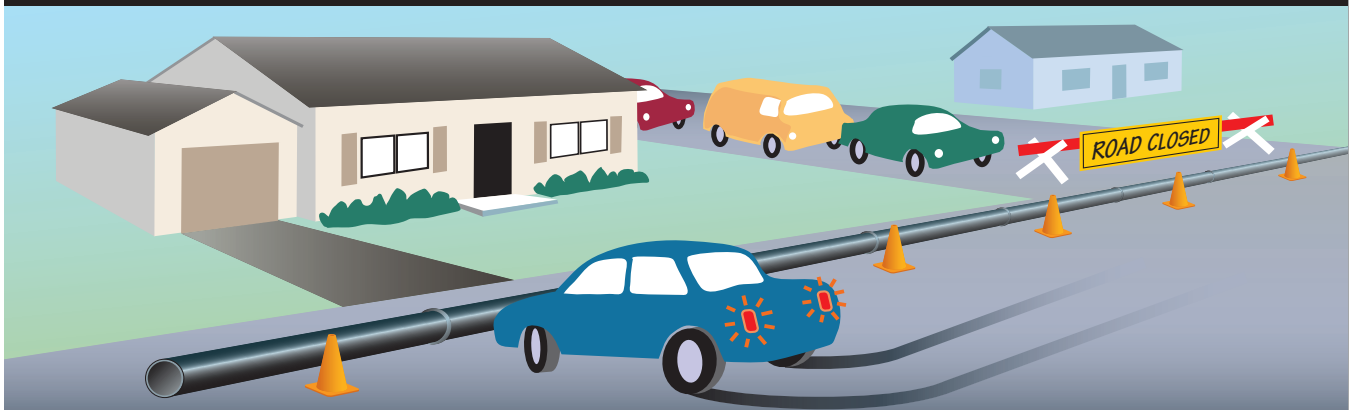
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