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The fused pipe was supported on rollers while awaiting the pull.

Project Features Record HDD Pull of 24" Fused PVC Pipe

Contractors have successfully pulled 24-inch, field-fused PVC pipe through a 4,440 foot directionally drilled borehole beneath the Stono River for the St. Johns Water Company in South Carolina. In another portion of the same project, field-fused PVC pipe was instrumental in protecting historic live oak trees along the adjacent River Road parkway, a nationally designated scenic highway.

The installation of Fusible C-905® pipe beneath the Stono River set a new record for the longest continuous horizontal directional drill (HDD) pull-in of large diameter thermoplastic pipe, according to Underground Solutions Inc., supplier of the only field-fused PVC pipe available for water and sewer applications.

Mears Group, Rosebush, MI, executed the drill and pull-in. BP Barber & Associates, Columbia, SC, was the engineer on the project, and the general contractor was Anson Construction, Charleston, SC.

The St. Johns Water Company – a water wholesaler – provides water service to the rural sea island communities of Johns Island, Kiawah Island, and Seabrook Island, all located near Charleston, SC. The new 24-inch transmission line provides additional flow to these scenic island communities without any of the disruption typically associated with a major pipeline installation. The directional drilling for the overall project was divided into four separately bid "divisions".

Personnel from St. Johns and BP Barber became interested in fused PVC pipe after visiting the nearby Secession Effluent Force Main project in Beaufort, SC, where a record 5,120 linear feet of Underground Solutions' 10-inch DR 14 FPVC™ pipe had been installed without a casing in a single pull under the Beaufort River.

Following the Beaufort site visit, 24-inch DR 18 Fusible PVC™ pipe was added to the St. Johns water transmission line project specifications as an alternate to 30-inch DR9 HDPE (thermoplastic polyethylene pressure pipe) based on the PVC pipe's greater safe pull force, smaller outside diameter, and high strength-to-weight ratio. Although steel pipe was also considered, it was ultimately rejected because it was heavier, more expensive, and posed long-term corrosion concerns. The use of fused PVC versus the HDPE base bid yielded approximately 10 percent savings to the project.

Fusion of 109 pipe joints commenced in December 2007, on the grounds of the Charleston Executive Airport. Winter wind and rain necessitated the construction of a structure around the McElroy 1648 fusion machine to shield the pipe from the elements during the fusion process. The completed, fused pipe string ultimately exceeded the length of the airport's east runway.

Mears Group mobilized in mid-January and completed swabbing of the borehole on February 13. Pull-in began at 8 a.m. on February 15 and was completed 14 hours later. Upon exiting the bore hole on the far side of the river, the print line on the pipe was still clearly legible, indicating a very smooth pull-in.

Anson Construction, the general contractor, provided support to Underground Solutions during pipe fusion, and performed pressure testing and reconnection of the HDD-installed pipe to the open-cut portion of the project. The new potable water pipeline was successfully pressure tested in late February and placed into service in Spring of 2008.

While the Stono River pull-in was a world-record, single continuous pull-in, the various drills along River Road included 23 separate pulls of 24-inch Fusible C-905® pipe ranging in length from 300 to 1,300 feet. For those divisions, general contractor R.H. Moore, Murrells Inlet, SC, selected Boretek of Ladsen, SC, to perform the HDD installation.

"One project objective was to preserve the root structure of the live oak trees," said Gary Shepherd, southeastern regional sales manager for Underground Solutions. The roadway is lined with grand live oak trees; some as large as 80-inches in diameter. All

trees along the road greater than 6-inches in diameter are protected.

"The lighter weight and smaller diameter of the 24-inch fusible PVC pipe compared to alternative 30-inch lines was a critical factor in installing the line without disturbing the trees," Shepherd said.

Ultimately, the River Road project involved four separate contracts and 64,000 feet (12.1 miles) of new 24-inch water line. Fifteen jack and bore installations were performed under small trees. All pipe installation, including open cut trenching, was completed within an extremely tight contract period of 250 days.

The use of fused PVC pipe on these South Carolina projects represents breakthroughs in pipeline construction and maintenance, according to those involved.

"Fusible PVC pipe is allowing us to establish a new frontier in HDD applications with plastic pipe," said Neil Smith, vice president of Mears Group. WW

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