WaterWorld

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Fused PVC Used to Slipline Damaged Concrete Pipe

With many older water and wastewater pipelines now surrounded by adjacent utilities or located beneath ever busier roadways, sliplining offers a low-dig replacement solution that reduces construction risk and minimizes disruption to the public.

30 inch FPVC™ Pipe being fused in the pit.

PVC pipe's high strength-to-weight ratio, corrosion resistance, and flexibility have made it a popular sliplining alternative. Since its introduction in 2004, Fusible PVC™ pipe has been successfully used in over 200 sliplining projects and is increasingly sole source specified due to its unique advantages in preserving maximum flow capacity while providing a fully structural, long-term renewal solution independent of host pipe condition.

Underground Solutions will be exhibiting its Fusible PVC pipe systems at ACE'10.

Case Study

In April 2009, major structural damage was discovered on the Long Wharf Sewer Force Main in the City of Newport, RI. Installed in 1978, the 36" pre-stressed concrete cylinder pipe (PCCP) conveys 80% of the city's wastewater for processing at the Connell Highway Wastewater Treatment Plant. The force main is an essential element of the city's underground infrastructure and traverses beneath the historic center of the city.

Due to the emergency nature of the situation, C.B. Utility, Inc. of Bristol, RI, was contracted by the city to install a temporary by-pass system and proceed with emergency repairs on the line. Upon closer inspection, the existing 36" PCCP force main was found to be so extensively corroded that simple point repairs at the failure locations were deemed insufficient to ensure a safe and reliable long-term solution. Installation of an entire new sewer force main was required.

Joseph Brito, Jr., Vice President of C.B. Utility, noted: "Early on we researched trenchless options to compliment the section we could open cut because excavating in the heart of historic Newport was never an attractive option for us. We evaluated CIPP solutions but they were expensive, were limited to short runs, involved complicated connections, and relied in part on the host pipe which was badly compromised."

The fused section of PVC is pulled into the host pipe.

C.B. Utility then turned to evaluating structural slipline solutions with thermoplastic pipe. Because maintaining maximum flow capacity was critical to the city, it was imperative to use a slipline pipe that could provide the greatest ID while fitting into the alignment of the existing 36" force main. Underground Solutions Inc. (UGSI) submitted hydraulic calculations for 30" DR25 FPVC™ pipe which demonstrated that flow capacity in the slipline section could be maintained due to the higher flow coefficient (C-Factor) of PVC (150) versus ~100 for the rough surface of the corroded PCCP line. City officials and their consulting engineering firm, Wright-Pierce, confirmed the flow calculations and reached a consensus to slipline with FPVC™ pipe.

"After meeting with Underground Solutions, it became clear that sliplining with their FPVC pipe product was the best technical approach as well as the most economical trenchless option. It provided a fully structural solution that eliminated future corrosion concerns," Brito said.

Sliplining operations commenced August 17, 2009, near the end of the busy summer season. UGSI provided an onsite construction supervisor to assist C.B. Utility with planning and coordination in order to maintain a tight schedule. To minimize excavation and surface disruption, a ⅓-mile segment (1,810 LF) was sliplined in a single pull. In all, six pull-ins were completed. The new 30" line was grouted in place, pressure tested, and connected to the direct bury PVC bell-

30 inch pipe ready for insertion.

and-spigot segment of the force main. The line was placed into service on schedule on October 28, 2009.

"Underground Solutions delivered on all their promises by providing a quality product and a very high level of support during planning, engineering, and construction," said Thomas Simbro, P.E., Senior Project Manager with Wright-Pierce in Providence, RI.

Underground Solutions will be exhibiting its products and services at Booth 449 at ACE'10. The company provides infrastructure technologies for water/wastewater applications. Its Fusible PVC™ products, including Fusible C-900, Fusible C-905 and FPVC™, contain a proprietary PVC formulation that, when combined with UGSI's patented fusion process, results in a monolithic, fully-restrained, gasket-free, leak-free piping system. The company's Duraliner™ is a patented, close-fit pipeline renewal system creating a stand-alone structural liner. For more information on the company and its products, visit www.undergroundsolutions.com. WW

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Phone: 858-679-9551
www.undergroundsolutions.com