

30-INCH FUSIBLE PVC® PIPE USED FOR HDD CROSSING OF THE HALIFAX RIVER

City of Daytona Beach uses horizontal directional drill to install force main

Overview

An estimated 71,300 people live over 90 square miles in Daytona Beach, located in eastern Volusia County, Florida. All of the sanitary sewer flow from the city's beachside service area flows through an existing 24-inch subaqueous force main, crossing the Halifax River to the city's Bethune Point wastewater treatment facility. In 2016, a capacity analysis report recommended replacing the aging force main to provide significantly more flow capacity and improved reliability.

The city hired McKim & Creed, Inc. to design the replacement force main. Initially, five different alignments, each involving the installation of a 30-inch force main using horizontal directional drilling (HDD), were considered for the Halifax River crossing. The recommended HDD alignment was straight, with drill entry on the east side of the Halifax River and drill exit on the west. This alignment was selected because the straight alignment reduced installation difficulty, was the most direct route to the Bethune Point Wastewater Treatment Plant and it allowed for the longest pipe staging area. The engineer evaluated alternative piping materials for the HDD segment and selected 30-inch DR 21 Fusible PVC® pipe, based on allowable safe pull force, hydraulic capacity (flow area and internal pressure capability), critical buckling capacity and compatibility with ductile iron fittings.

Based on the size, scope and complexity of this project, McKim & Creed and the city determined that requiring minimum HDD qualifications for all the bidding contractors was a good risk mitigation measure to protect all stakeholders during construction. The project was bid in January 2017 and TB Landmark Construction, Inc. (TBL) was awarded the project.



Assembled Fusible PVC® pipe ready for installation

Pipeline Details and Project Summary

Project:	Halifax River Force Main Improvements
Location:	City of Daytona Beach, Florida
Length and Pipe Size:	2,385 LF 30-inch DR21 DIP Fusible PVC® pipe
Pressure Test:	100 psi for 2 hours
Installation:	Horizontal directional drill
Owner:	Daytona Beach Utilities Department - Nichole Lloyd, P.E.
Engineer/HDD Design:	McKim & Creed, Inc. – Mark Ralph, P.E./ Blake Peters, P.E.
Contractor/Driller:	TB Landmark Construction, Inc. – Marty Adams

In addition to the many construction challenges associated with an HDD project of this size and scope, noise abatement was a concern on the east side of the drill alignment due to the proximity of residential properties to the HDD equipment. This necessitated the construction of a 16-foot-high by 660-foot-long sound barrier around the drill site. TBL utilized a drill rig with a maximum pull-back capacity of 500,000 pounds and a drill mud recycle system for the pilot bore, reaming and pipe pull back. A plan was developed for the Fusible PVC® pipe assembly and layout on the west side of the project to maximize the available staged pipe lengths and minimize the impact to the baseball field in the immediate vicinity at the Bethune Point Sports Complex. Due to the limited layout space for staging the assembled Fusible PVC® pipe, two pipe segments, 1,395 and 990 feet long, were pre-fused and one intermediate fusion joint was completed during the pipe installation.

Despite multiple HDD oriented challenges during the construction, TBL, with the fusion support of Underground Solutions, successfully completed the HDD installation of 2,385 feet of 30-inch DR 21 Fusible PVC® force main under the Halifax River on July 24, 2017.



Drill rig on the east side of the crossing

“Challenging HDD projects benefit from having a pre-qualified HDD contractor. The success of this project was greatly impacted by having an experienced contractor on board who could troubleshoot and resolve challenges in the field.”

*Blake Peters, P.E., Project Engineer
McKim & Creed, Inc.*

Beachside service area map



Noise abatement structure

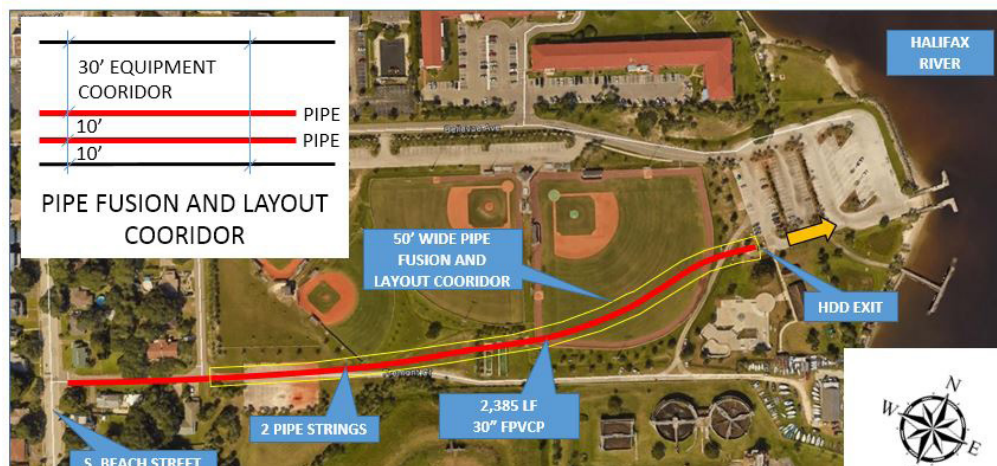
“TB Landmark has successfully completed many challenging projects utilizing Fusible PVC® pipe with the Underground Solutions team.”

*Marty Adams, Project Manager
TB Landmark Construction, Inc.*

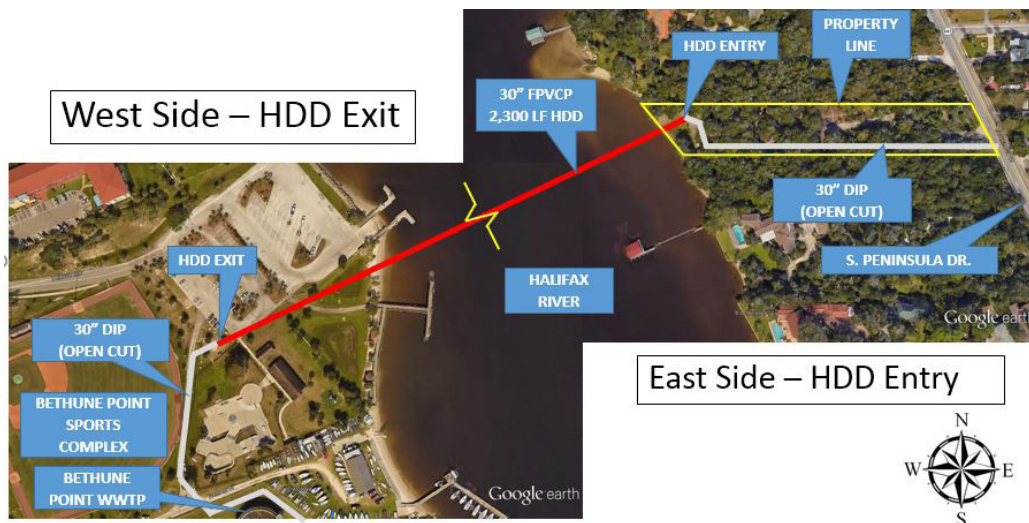
“This application was a good fit for 30-inch DR 21 Fusible PVC® pipe based on allowable safe pull force, hydraulic capacity, critical buckling capacity and compatibility with ductile iron fittings.”

*Mark Ralph, P.E., Project Engineer
McKim & Creed, Inc.*

Fusible PVC® pipe assembly layout plan



Overall force main alignment for the Halifax River crossing



Underground Solutions, Inc. provides infrastructure technologies for water, wastewater and power cable conduit applications. Underground Solutions' Fusible PVC® pipe products, including Fusible C-900® pipe and FPVC® pipe, utilize patented technology to produce a fused monolithic, fully-restrained, gasket-free, leak-free piping system ideal for trenchless (horizontal directional drilling, pipe bursting and sliplining) or conventional "open-cut" installations and are available in 4-inch to 36-inch diameters. The combination of standard fittings and lower weight with higher flow for a given pressure class versus other thermoplastic pipes ensures that Fusible PVC® pipe brings greater economy to most pipeline projects.



Underground Solutions, Inc.
858.679.9551
www.undergroundsolutions.com