# Daytona Beach CIPP Project: 30-Inch Force Main Rehabilitation

While traditional cured-in-place pipe (CIPP) for gravity pipeline systems has been around for more than 45 years, reinforced CIPP for pressurised force mains and potable water applications is still relatively new. Today, Insituform is working to develop better technologies for pressurised systems. The company is also tackling tougher projects. One such project on a lift station and pipelines in Daytona Beach, Florida presented a variety of challenges in high-profile areas.

## Project Background

The 30-inch prestressed concrete cylinder pipeline (PCCP), originally a raw water transmission system that had been taken out of service decades ago, was being converted to a sanitary sewer force main. Project design and inspection for the City of Daytona Beach project were carried out by the engineering firm McKim & Creed. After a public bid offering, a fibre-reinforced CIPP rehabilitation system was approved for the project. Known commercially as Insituform® RPP (reinforced pressure pipe), the system is a reinforced pressure pipe liner and vinyl ester resin system that combines traditional CIPP with specially needled fibreglass material to provide added tensile strength and adequate internal pressure resistance for pipeline performance.

As the general contractor for the project, Insituform was not only responsible for CIPP lining but also for project management and onsite field management of all subcontractors. These subcontractors performed various duties such as CCTV, cleaning, jack & bore, installation of new ductile iron pipe and fittings, as well as excavation and concrete repair work.

## Location

Working in Daytona Beach presented several challenges as long portions of the job were within the front parking lot of one of the world's most famous motor racetracks – the Daytona International Speedway – home of the Daytona 500 on Speedway Boulevard (Florida Highway 92).

There were numerous considerations working in such a well-known, high-profile area. The project spanned from the late fourth quarter of 2014 to the second quarter of 2015. Working around holidays and many Speedway events such as Daytona Bike Week and Daytona 500 events presented special challenges. These events dominated the city and presented unique logistical challenges such as finding hotel lodging and places for crew members to eat.

The project extended from golf course access on the western end through commercial business areas, passing through the Speedway and terminating on Daytona Beach airport property at the eastern boundary.

## Project Overview

The project consisted of three separate bids. Within Project A, renovations and improvements were made to the lift station pumping sewage to the line. The second component, or Part B, rehabilitated approximately 8,400 feet of 30-inch PCCP using the fibre-reinforced Insituform® CIPP RPP product. The third and final portion of the project consisted of the direct burial of a new ductile iron pipe (DIP) west of the CIPP lining termination point.

To access the job site, Insituform crews had to set up the project from a utility easement between holes on a golf course, proceed through a light commercial area, and then dig and replace sections with new DIP and jack & bore under Speedway Boulevard to the Daytona Speedway property and across the Speedway car park over to the airport entrance road. The jack & bore method consists of boring through the ground and then installing a casing pipe that protects a ductile iron pipe being pushed through the casing to create a horizontal shaft. In these areas, new pipelines were installed

Crews also employed the jack-and-bore method under the Daytona Beach Airport entrance road and then continued the CIPP lining portion all the way to the Daytona Beach Airport property line. Since the pipeline was 30 inches in diameter, the liner was installed using a steel frame for the water inversion, and the wet-out tube was delivered to the top of this frame using a 30-foot-long roller bed.

The roller bed assisted the crew in loading the pre-wet-out tube directly from the refrigerated lorry up to the top of the inversion unit. The tube was then installed using water cure, a traditional water inversion method.

Throughout the project process, steps and dewatered and shored trench boxes were necessary due to the pipe's location in relatively deep wet sand soil. The lining was accomplished using a traditional downtube, water inversion, and water curing process. The 8,400-foot-long PCCP line was rehabilitated in two phases, necessitating 14 separate CIPP installations.

## Subcontractor Work

The cleaning was carried out using conventional jet cleaning with access provided by two subcontractors. Hazen Construction provided the new pipe installation, and the jack-and-bore was performed by Downtown Underground, Inc. JD Weber Construction provided additional access when required pits deviated from the contract document's original plans due to either shot length or unexpected job site issues.

According to Rick Baxter, Insituform's U.S Operations Manager for Pressure Pipe, the PCCP line was an old, abandoned line and had as-builts that helped define the scope of the job. However, when the pipe was cleaned and pre-video inspected, unforeseen bends were discovered that were not located on the original as-built. Baxter explained that the city made the decision to excavate and replace these sections with new ductile iron pipe to remove the original fittings. Once the fittings were removed, the pipeline was able to be properly lined with CIPP, providing more consistent product performance throughout the length of the pipe.

Another challenge included dealing with Mother Nature. Numerous heavy rain events created area floods and access problems. After lining, Krausz USA's Hymax fittings were installed on the end terminations to allow the CIPP lining to be connected to the DIP pit closure pipes, as specified on project submittals. The fittings helped the liner meet the 50 psi design requirement. Once the installation was complete, the pipeline was pressure tested to comply with trenchless industry standards at 100 psi. This marked the successful completion of the project.

## QUOTE:

"Several rain events, topping out at 8 inches a day, created problems with pipe access, pit access and stability and required re-cleaning previously prepared pipelines. Although not typical rainfall events, these storms are not unheard of in Florida. It is common that storms like the ones encountered on this project can create numerous construction challenges such as delays and rework." – Rick Baxter, U.S Operations Manager for Pressure Pipe Insituform

## PIPELINE DETAILS AND PROJECT SUMMARY:

**Project:** Daytona Beach 30-inch Force Main CIPP Rehabilitation

**Location:** Daytona Beach, Florida

**Length and Pipe Size:** 8,400 LF 30-inch ductile iron pipe

**Pressure:** 100 psi per ASTM F1216

**Installation:** Water inversion

**Owner:** City of Daytona Beach

**Engineer:** McKim & Creed

**Prime Contractor:** Insituform