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Abstract Title: The Benefits of Combining Technologies

Abstract:

Client:

Southwest Suburban Sewer District

Engineering and Installation Partner:

Insta Pipe - Trenchless Pipe Repair, Olympia, WA

Year of Construction:

May 2016

Type of Project:

Rehabilitation of an 8 inch sewer force main with 60psi rating and vertical bends in host pipe alignment

Our services:

- Supply and delivery of the flexible low Pressure 8 inch Primus Liner (ANSI/NSF 61 approved)
- Delivery of the 8 inch Primus Line low pressure connectors (150 lbs)

Task:

After a recent emergency repair the Southwest Suburban Sewer District decided to upgrade the existing primarily ductile iron line. The project was located at Shorewood Dr. SW corner SW 125th and runs down the hill to pump station 7, which is located between two houses next to the bay. The section to be rehabilitated was 262 linear feet long and encloses multiple vertical bends of up to 22 degrees with a maximum operating pressure of 60 psi. Since the pipe runs on a steep hill and through people's gardens in a residential area, a traditional open trench solution was not reasonable. Therefore, the sewer district had to choose between two trenchless technologies: Primus Line® and CIPP.

Technical Details:

Host Pipe Material: Cast iron and ductile iron

Transported Medium: Domestic sewage

Host Pipe Diameter: 8 inch

Operating Pressure: 60 psi

Raedlinger Primus Line® System: 8 inch Primus Liner with a nominal design pressure of 290 psi

Two 8 inch connectors with double-sided 8 inch ANSI flanges with nominal pressure design of 150 lbs

Total Length: 262 ft

Number of Construction Sections: 1 installation section with 262 ft

Installation Time: 1 day for the installation of the Primus Liner and connectors

Rehabilitation System:

After an open communication with Primus Line and Insta-Pipe, the Southwest Suburban Sewer District decided to use the Primus Line® system, a flexible relining solution for the trenchless renovation of pressure pipes. The system convinces with its ability to negotiate bends, the minimally invasive construction footprint and the short installation time. In this particular case, the budget was reduced by over 50% compared to the lowest offers with CIPP and was even cheaper than the Engineer's Estimate.

Project Description:

The decision was to install a Primus Line® DN 200 ND with a nominal diameter of 8 inch and a nominal design pressure of 290 psi. Since the technology works with an annular space to achieve long insertion lengths and negotiate bends, the liner provides an actual outer diameter of 7.165 inch and inner diameter of 6.693 inch. According to the calculation of the technical department of Primus Line, the pressure rating of the system through the bends is 217 psi and thus capable of accommodating the maximal operating

pressure of 60 psi along the entire pipe route. To complete the system, the low pressure connectors with an operating pressure of 150 psi were used to guarantee a durable and tensile strong connection. In a first step, the two excavation pits for the installation of the Primus Line® system had to be created. After that the station was pumped down, the force main was dewatered and the pipe was cut for water jet cleaning and CCTV inspection. Due to the heavy incrustations in the host pipe this was performed in a 6 hour window on the first two days, because there was no bypass planned and so the pipe had to be spooled back together in the evening to empty the pump station. After one last cleaning and inspection on the third day, the pre-folded and coiled on a transport reel Kevlar® reinforced composite liner was inserted with speeds up to 15 ft. /min and inflated with 7 psi to bring it back into its round shape. Subsequently the low pressure termination fittings were installed, a pressure test with 60 psi was performed and successfully completed and the pump station was put back into service that evening. During the next morning the pits were closed and the project was successfully accomplished after a total construction time of 4 days and without shutting the pump station down for longer than a daytime window

