Job Report

Rehabilitation of a drinking water pipeline crossing under a river: Project with Société Wallonie des Eaux in Lessines, DN 400 PN 10

Client:
Société Wallonne des Eaux (SWDE)

Year of Construction:
October 2019

Type of Construction Measure:
Rehabilitation of two drinking water pipelines (supply line and parallel safety line) running under the river "La Dendre" in the city centre. Each pipe (siphon) has 4 bends with 45°.

Primus Line® installation partner:
Contractor: Hydrogaz (Wallonia)/Canalco (Flanders) - Partner of Primus Line for the rehabilitation of water and gas pressure pipes

Situation:
SWDE ensures the drinking water supply for the Walloon part of Belgium with the exception of the city of Brussels. This part is divided into 4 sectors, including Lessines, known as the birthplace of the famous painter Magritte.

The DN 400 pipeline running under the Dendre river is the neuralgic axis of the city, as it connects the two districts. As a preventive measure, it was therefore necessary to renew the safety pipeline.

SWDE was looking for new methods, as conventional technologies did not allow the existing siphon pipe to be rehabilitated. Re-laying with alternative technologies was also not possible. Especially the horizontal directional drilling technique was unsuitable, as Lessines is built on hard rock, but the soil is not homogeneous at this point.

With the Primus Line® system, both the service and the safety line could be quickly renewed in only one working cycle. SWDE therefore opted for this innovative trenchless technology without any impact on the environment and where the additional risk of corrosion was completely eliminated.

Technical Details:

Material of Host Pipe:	Uncoated steel
Transported Fluid:	Drinking water
Diameter of Host Pipe:	DN 400
Operating Pressure:	8 bar; test pressure 10 bar
Primus Line® System:	DN 400 PN 18
	Connectors DN 400 with DIN flanges DN 400 PN 10
Total Length:	2 x 30 m
Number of Sections:	2 sections (1 for each renovated pipe)
	Installation and subsequent successive commissioning before installing the 2nd section
Installation Time:	Preparatory works and 1 day per pipe between pulling and installation of the end fittings

Rehabilitation System:

The Primus Line® system complies with EN ISO 11295:2017 - Classification and information on the design and application of polymeric pipe systems for rehabilitation. The system consists of a reinforced Kevlar® layer and specially developed connectors. This reinforced layer withstands the operating pressure of the pipe alone and is not bonded to the old pipe, leaving an annular space. The reinforced liner is manufactured seamlessly in an ISO 9001-certified plant in Germany and then transported on a reel. Thanks to its flexibility, the liner can pass through bends of up to 45°, be laid over lengths of more than 1,000 m in one piece and at a speed of up to 600 m per hour.

Systematic tests for complying with highest requirements:

Systematic factory acceptance test with a burst test on the DN 400 pipeline. The reinforced liner was tested with a burst pressure of 54.5 bar. In long-term tests according to DVGW VP 643, a service life of 50 years was determined with a safety factor of 2.0. An additional safety factor of 1.25 is added. The network can be safely operated with an operating pressure of 10 bar.

Project Description:

The section was cut off for the construction works. Camera inspection showed that the liner could be pulled into the existing pipe without additional cleaning measures. The liner was pre-folded in a U-shape and delivered to the construction site on a drum. The liner was pulled in with little force using a cable winch. The installed liner was then restored to its round shape with compressed air. Using flanges, the connectors were installed in about 3 hours per pipe. This extended the service life of the system by at least 50 years.