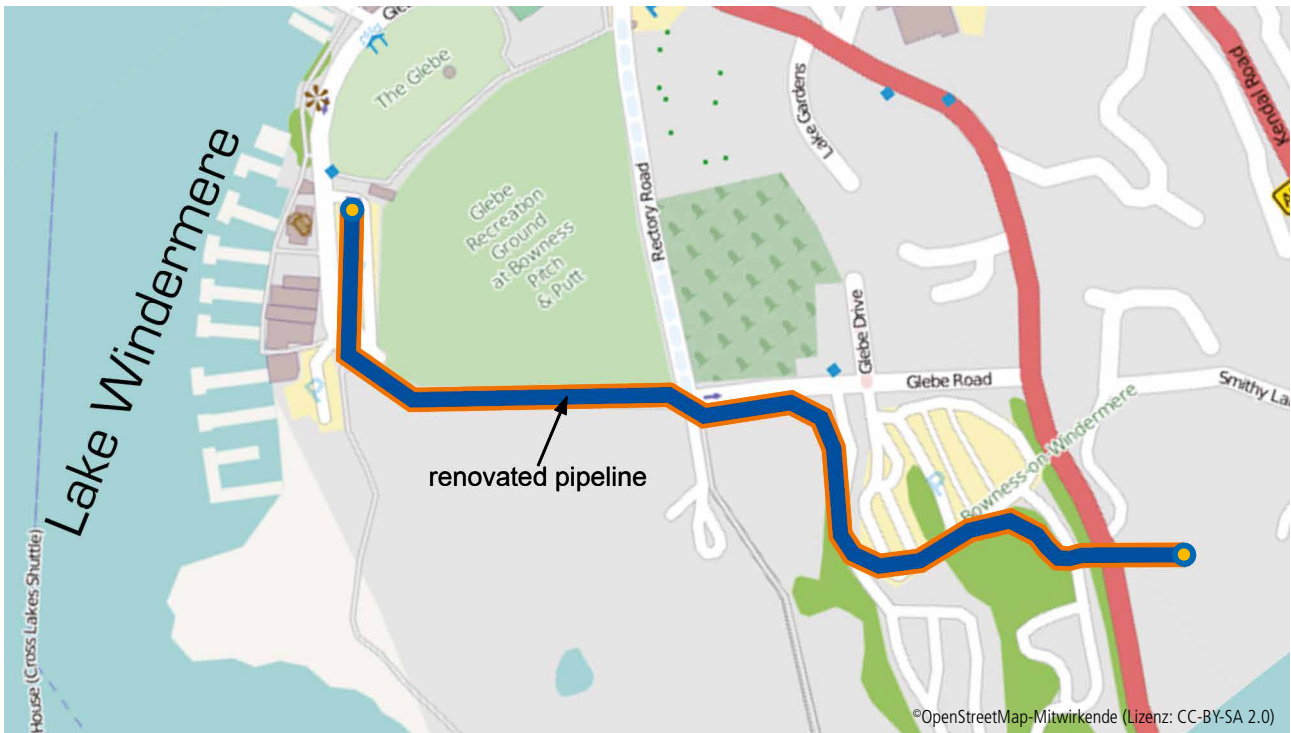


 **Job Report**



Rehabilitation of a DN 300 sewer rising main with a single length of 800 m for United Utilities

Client:

United Utilities, United Kingdom

Year of Realisation:

July 2016

Type of Project:

Rehabilitation of a ductile iron DN 300 sewer rising main

Our Services:

- Delivery of the flexible Primus Liner DN 300 PN 12
- Delivery of the Primus Line connectors with DIN flanges DN 300 PN 10
- Supervising the installation of the Primus Line® system

Task:

The network operator United Utilities plc and Amey plc, located in the Northern part of the United Kingdom, were confronted with a leaking sewer rising main. The ductile iron pipe was installed in the 1970s and showed significant deterioration. Pinholes were present and the wall thickness was reduced to 1-2 mm, especially at the bottom of the pipe due to abrasion and chemical degradation. The section to be renovated had a total length of 800 meters and four 45 degree bends were present. The sewer rising main is operated with a maximum pressure of 2 bar. The client was looking for a renovation method with long installation lengths that could traverse bends, but also work with a reduced deployment of machinery since the close-by one-way street had to remain open for traffic.



Technical Details:

Material of host pipe:	Ductile iron
Transported Medium:	Residential waste water
Host Pipe Diameter:	DN 300
Operating Pressure:	2 bar
Primus Line® System:	Primus Liner DN 300 PN 12 with ID = 270 mm 2 connectors with DIN flanges DN 300 PN 10
Total Length:	771 m
Number of sections:	installed in one section
Installation time:	5 working days (including cleaning, insertion and inflating of the liner, and installation of the connectors)

Rehabilitation System:

For this challenging task United Utilities plc and Amey plc decided to use the Primus Line® system, a flexible sliplining solution for the trenchless rehabilitation of pressure pipes. The Primus Line® system provides clients with long insertion lengths of 1,000 meters and more in one single step, the product's ability to traverse bends of up to 45 degree, and a fast installation with up to 600 meters per hour. The system has a strong track record with numerous successful installations all over the world for different applications, such as potable water, gas mains, and crude oil pipelines.

Project Description:

In June 2016, the trenchless expert Warrior Trenchless Solutions Ltd, was entrusted with the rehabilitation of this sewer rising main deploying the Primus Line® system. In a first step, a by-pass overpumping system made of HDPE was set-up to seclude the pipe to be renovated from the network. The pipe was opened and the rope connection for the entire length of 800 meters was produced using a special inflatable bag and a vac truck. Once the rope connection was created, the transport reel (l = 4.2 meters) with the pre-folded Primus Liner was placed in a 90 degree angle to the axis of the host pipe due to the confined space situation. The auxiliary winch was placed at the destination pit and a Bagela winch (10 tons) was placed at the start pit. The pulling head was mounted to the liner. The cleaning of the host pipe was performed with pull-through rubber (pigging) discs and the remaining silt in the 45 degree bends of the host pipe, was removed with water jetting. Once the free inner diameter of the host pipe was verified with a CCTV, the liner was installed uphill with a height difference of approximately 15 meters due to the confined space situation of the site. The maximum pulling forces were 2.8 tons and an installation speed of 220 meters per hour could be achieved. After the liner was tension-free, the liner was turned back into a round shape using compressed air and the Primus Line connectors with DIN flanges DN 300 PN 10 were installed. After a subsequent pressure test and re-integration into the network, the rehabilitation works were completed. The system could convince with the ease of use, long insertion lengths, the ability to traverse bends, and the minimal working space needed on-site. In addition, the flow rate was improved by approximately 6.5 %.