





# Rehabilitation of DN 300 water pipes at Van Don bridge

#### **Client:**

Quang Ninh Water Company (QUAWACO)

Year of Construction: September 2019

## **Type of Construction Measure:**

Rehabilitation of a DN 300 steel water main located at Van Don Island, Vietnam

## **Our Services:**

- On-site accreditation training of the contractor's staff
- Supply of 840 m of DN 300 low pressure Primus Liner and 6 termination fittings DN 300 PN 10

#### Situation:

The network operator Quang Ninh Water Company (QUAWACO) is operating a DN 300 steel water main that is located underneath and inside a bridge construction to supply Van Don Island. The three individual bridges have a length of 410 m, 170 m and 270 m, and the pipes were originally installed in 2002 at the same time when the bridge was constructed. Because of corrosion and in order to secure the water quality, the water network operator decided to perform preventative maintenance on these steel pipes. The goal of the renovation works is to elongate the life span of the pipes and secure the water supply. Due to the difficult access and in order to quickly upgrade the existing pipe, the Primus Line<sup>®</sup> system was the preferred method. It was the first time that the Primus Line<sup>®</sup> system has been deployed in Vietnam although it has been in use all over the world since 2001. In order to install the Primus Line<sup>®</sup> system, only a small investment in necessary tools is required. In addition, the training for the contractor was performed locally by a Primus Line instructor in two working days. During the same week, the first bridge was renovated by the contractor under the supervision of the Primus Line instructor. QUAWACO proactively manage the water supply in their region and have reduced the NRW rate below 18% over the past couple of years.



# **Technical Details:**

Material of Host Pipe: Transported Fluid: Diameter of Host Pipe: Operating Pressure: Primus Line<sup>®</sup> System: Total Length: Number of Sections: Installation Time: Steel, unlined Potable water DN 300 6 bar; test pressure: 9 bar DN 300 PN 12 840 m 3 sections with 410m, 170m, and 270m 3 weeks

# **Rehabilitation System:**

The Primus Line<sup>®</sup> system is referenced in EN ISO 11295:2017 – classification and information on design and applications of plastics piping systems used for renovation and replacement. The Primus Line<sup>®</sup> system also complies with the technical standard DVGW VP 643 – flexible textile-reinforced plastic inliner for pipe-relining of gas high pressure pipes. The system consists of a Kevlar<sup>®</sup>-reinforced liner and specifically developed end fittings. The liner accommodates the operating pressure of the pipe, due to the reinforcement layer and does not bond to the host pipe. An annulus space remains. The liner is seamlessly manufactured at an ISO 9001 certified production plant in Germany and transported on reels to the site. Due to the material's flexibility, the liner can traverse angles of up to 45 degrees, can be installed in lengths of more than 1,000 m in one pull, and has an installation speed of up to 600 m per hour. The Primus Line<sup>®</sup> system complies with numerous international hygienic standards for the safe transfer of potable water.

# **Project Description:**

In a first step, the pipe was CCTV inspected to assess the condition of the host pipe. The CCTV inspection revealed several areas where incorrectly made welding seams were protruding into the cross-section of the pipe. The individual pipe shots were butt-welded. Due to the accessibility of the steel pipe located underneath the bridge and inside a box girder respectively, the welding seams were removed manually. The contractor performed mechanical cleaning of the host pipe using scrappers and rubber pigs. The 840 m of liner were delivered pre-folded into U-shape on timber transport reels directly to the site. A pulling wire was mounted to the start of the liner and connected to a rotation joint and subsequently to the cable of a pulling winch. The liner could be installed in less than one hour for each section and was re-rounded using compressed air. The end fittings equipped with DIN flanges PN 10 were mounted. The renovated section was successfully pressure tested using potable water with 9 bar. The pipe was reintegrated into the network using HDPE pipe shots. The life of the asset has been extended by 50 years and the water quality is secured.

Rädlinger primus line GmbH Kammerdorfer Straße 16 · 93413 Cham · Germany Phone: +49 9971 8088-0 · Fax: +49 9971 8088-9999 info@primusline.com · www.primusline.com