# Job Report


## Fresh water main for energy supply Mittelrhein GmbH in Koblenz

### Client:
Energieversorgung Mittelrhein GmbH in Koblenz

### Year of manufacture:
2012

### Type of construction:
Restoration of two parallel running fresh water mains DN 400 in the Balduin bridge in Koblenz / Rhein

### Our services:
- Delivery of flexible high pressure main Primus Line® and Primus Line connector
- Installation of Systems Primus Line®

### Situation:
The mains to be renewed, DN 400, are laid in the superstructure of the heavily used Balduin bridge over the river Mosel near the Deutsches Eck in Koblenz. The mains sections to be restored were determined by the client with l= 2 x 52 m und 2 x 195 m (DN 400). Access to the mains sections was only possible via chambers in the abutments of the bridge and via bays and chambers at the pillars of the bridge. The road over the bridge „An der Moselbrücke“ was not to be blocked for traffic at any of the construction phases.
Due to the confined and thus difficult to manage local situation, the Energieversorgung Mittelrhein GmbH decided on a fast, space-saving and bend-capable pipe restoration with the

System Primus Line®. It was agreed to place the hose drums on the bays of the pillars and the winches at the abutments of the bridge. According to the requirements of the principle, the utilised restoration system was supposed to be capable to allow for an insertion length of 195 m also through the arcs. While sections l= 52 m exhibit a continuously straight progression, respectively two arcs at 45 degrees exists in the sectors l = 195 m at the end of the line in the abutment bridge, on the side of the city swimming pool. As requested, the Primus Line® was to allow for an operating pressure in the fresh water mains of 10 bar also in the arcs. In order to ensure this operating pressure, a 1-layer high-pressure hose Primus Line was fed into the straight-running line sections and a 2-layer high pressure hose Primus Line in the sections with the arcs.

## Technical Details:

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| Host Pipe Material: | Pipe made of grey cast iron GG |
| Transported Medium: | fresh water |
| Host Pipe Diameter: | DN 400 |
| Operating Pressure: | PN 10 bar |
| Primus Line® System: | Flexible high pressure pipe DN 400 PN 20 bar (1-layered) |
| Total Length: | 52 m + 52 m = 104 m |
| Primus Line® System: | Flexible high pressure pipe DN 400 PN 40 bar (2-layered) |
| Total Length: | 195 m + 195 m = 390 m |
| Number of Construction Sections: | 4 installation sections with l= 2 x 52 m and 2 x 195 m |
| Installation Time: | Cleaning of pipe, installation of System Primus Line® and execution of pressure tests within a total of 14 working days |

## Rehabilitation System:

The Energieversorgung Mittelrhein GmbH decided on the installation of the System Primus Line® by Rädlinger. Primus Line® is a flexible high pressure hose coated with plastic which can be produced without seams in-house at the company Primus Line with lengths of up to 4,500 m. According to the available test certifications DVGW W270 and the KTW-Guideline, the system is also suitable for the application in the restoration of fresh water mains.
The high pressure hoses Primus Line DN 400 for fresh water with 1-layer and/or 2-layer construction installed in the pipes sustain operating pressures in the pipe of up to 20 and/or 40 bar.

## Project Description:

Pipes DN 400 in the bridge sector were blocked off and separated from the fresh water network. In preparation of the pipe restoration the pipes and fittings in the chambers of the abutments Lützel and city pool as well as in both pillars at the river Mosel were dismantled. A core bore was placed in the chamber wall of the abutment Lützel in order to insert the winch rope.
Deposits / incrustations intruding into the pipe diameter were detected during the subsequent TV inspection of the pipes DN 400. These were removed with metal scrapers and rubber discs during the cleaning of the pipe. The hoses Primus Line DN 400 PN 20 and DN 400 PN 40 were pre-folded at the factory in Cham, wound onto drums, transported to the construction site and inserted into the existing pipes DN 400. Due to the employed folding technique and the associated reduction of the pulling forces for Primus Line®, hoses DN 400 could be respectively installed in the restoration sections with l = 52 m with a maximum traction of 5 kN. In sections l= 195 m a maximum traction of only 17 kN was required. The permissible pulling forces for the high pressure hose Primus Line DN 400 are 100 kN. Following the installation of the connector Primus Line, the restored pipe section was subjected to a leak test according to DVGW W 400-2.

The restoration of both pipes was successfully concluded with the disinfection, rinsing and the subsequent connection of Primus Line® to the existing pipe network.
The chosen form of restoration allowed for the supply security with fresh water in an extremely short construction time and without interfering with the surface of the bridge or the impairment of the traffic on the Balduin bridge



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