



## Job Report



# Rehabilitation of an asbestos cement trunk water main with a length of 10 kilometres

### Client:

Municipality of Reocín, Cantabria, Spain

### Year of Construction:

December 2016 – April 2017

### Type of Construction Measure:

Rehabilitation of an asbestos cement trunk water main

### Our Services:

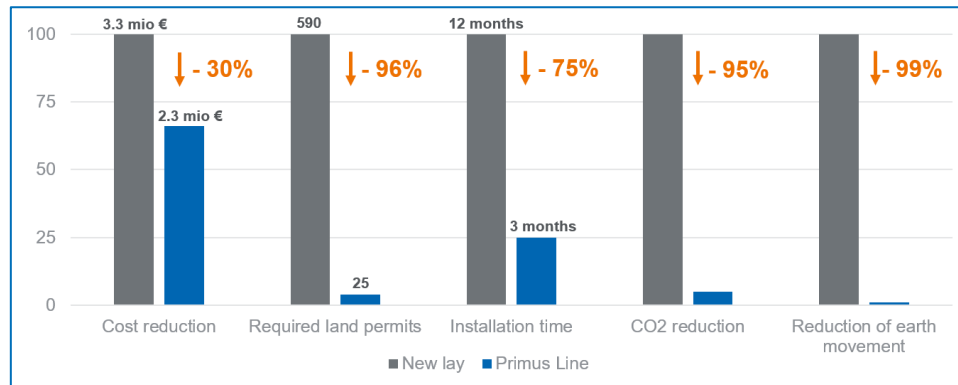
The work involved the rehabilitation of 9,850 metres of DN 250 asbestos cement water main with the DN 250 PN 15 Primus Line® system, and 495 metres of DN 250 PVC pipes with the DN 200 PN 18 Primus Line® system.

### Situation:

The municipality of Reocín in central Cantabria, Spain has a supply system consisting of a source from the River Saja, a treatment plant in Ruento and a DN 250 asbestos cement water main that extends for 10 kilometres to the municipal reservoirs. This system supplies water to a population of 15,000 inhabitants, and the demand rises sharply during the holiday season.

The water main was constructed in the 1950s and was in a critical condition with frequent breaks and service interruptions. The water loss rate on this pipe amounted to approximately 25%. The Government of Cantabria is responsible for the main water supply infrastructure in the region, and it decided to begin urgent work on its full restoration.

While the original plan was to replace the piping using a conventional open trench installation, the water main runs through areas near the environmentally sensitive Saja Nature Reserve and a large amount of land would have been occupied during the installation work. Hence, the Government of Cantabria's Water Board decided to look into trenchless rehabilitation solutions. A detailed study into the alternative Primus Line® system proved its feasibility, revealing cost savings of up to 30% in comparison to open trench replacement. In addition, the construction period could be reduced from 12 to 4 months. As a result, a change of technology was favoured. The contract was awarded to the successful bidder, Dragados S.A., which commissioned the trenchless specialist Sinzatec to carry out the rehabilitation work on the water main.



### Technical Details:

Material of Host Pipe:	Asbestos cement
Transported Fluid:	Drinking water
Diameter of Host Pipe:	DN 250
Operating Pressure:	7 bar
Primus Line® System:	DN 250 PN 15, DN 200 PN 18
Total Length:	10,345 m
Number of Sections:	20
Installation Time:	4 months

### Rehabilitation System:

The Primus Line® system consists of a flexible Kevlar®-reinforced composite liner with inner and outer PE coating and specifically developed end fittings. The liner accommodates the operating conditions of the water main independently from the host pipe due to the seamless woven aramid fabric reinforcement. The liner is installed into the host pipe with an annulus space, relieving the host pipe from the operating conditions. The product's characteristics allow for long installation lengths of 1,000 metres and more, the possibility to traverse around bends of up to 45 degrees, a small installation footprint with liner installation speeds of up to 600 metres per hour. A wall thickness of only 6 millimetres minimizes cross-sectional losses. The system complies with numerous international potable water certifications including KTW W 270, NSF/ANSI 61, AS/NZS 4020:2005 and many more.

### Project Description:

The work was scheduled at 20 different installation sites, arranged according to the layout of the network, reinstatement of fittings such as air and scour valves and the location of existing services. The length of these sections varied from 161 to 908 metres. The average section measured between 500 to 600 metres. A total of sixty DN 250 and four DN 200 low pressure Primus Line connectors were required.

Before cleaning the water main and inserting the Primus Liner, the water supply had to be cut off from the section to be restored. In this case, it was possible to isolate the section using an existing water supply from the "Autovía del Agua", an underground aqueduct at a point halfway along the water main. A provisional inlet was set up there, so that restoration work could begin along the first 7 kilometres without a bypass. A provisional pipeline had to be installed along the final 3 kilometres using DN 110 HDPE pipes, and the restoration work was carried out section-by-section.

On the restored sections sharp bends of up to 45 degrees, sweeping bends in the asbestos cement water main, and elevation changes had to be accommodated. The 10 kilometre water main crosses bridges, motorways, roads, railways, urban areas, uncultivated landscapes, woodlands and pastures.

Work began in December 2016 and came to an end only four months later in April 2017. This is the largest ever project executed with trenchless technology in Spain and highlights the benefits of using trenchless solutions such as Primus Line® for the full rehabilitation of a supply network.