



# TRENCHLESS REHABILITATION OF WATER MAIN ASSET

## NUFLOW OTAGO

Borlasses Rd Water Main | Dunedin City Council

### PROJECT OVERVIEW

The rising main located on Borlasses Road, Port Chalmers, had shown signs of advanced corrosion and reduced structural integrity due to age-related deterioration. The DN150 cast iron/AC pipe, originally installed below ground level with shallow cover depths (0.6–1.2m), was experiencing leak risks under pressure (design operating: 1000kPa, max: 1600kPa).

Given the pipe's location on a hillside with 30-40m of elevation change and near sensitive marine and road corridor environments, traditional open-trench replacement methods posed challenges with traffic management, excavation depth, reinstatement costs, and environmental risk. A trenchless rehabilitation method was required.



## THE CHALLENGE

**Environmental Challenges** - Zero-excavation corridor beneath rail and highway.

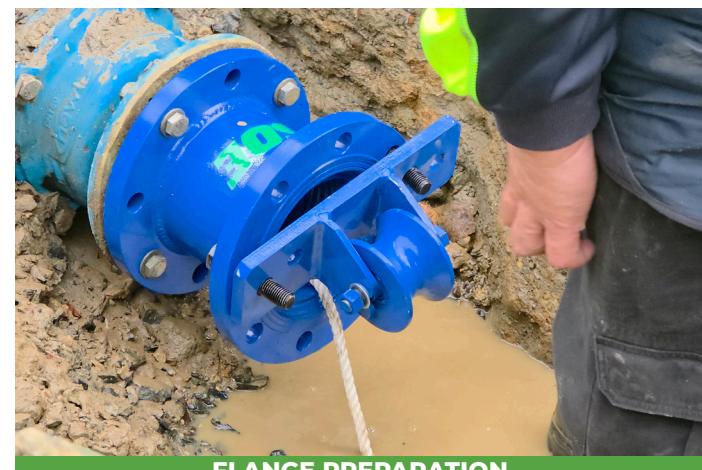
**Pressure** - High test pressure acceptance of 1.6 MPa

**Diameter Changes** - Variable host pipe material (cast iron / AC mix) of uncertain remaining thickness.

**Limited cover depth** - Restricting conventional pulling forces.



LINER PREPARATION



FLANGE PREPARATION

## THE SOLUTION

The ASOE Fabric-Reinforced Flexible Plastic Pipe (FRFPP) is folded into a U-shape, winched through the main, and expanded with air to form a close-fit, leak-resistant inner hose. It acts independently of the host pipe yet gains ring stiffness from the casing—ideal where the pipe is mostly sound but excavation is impossible. This installation was the first ASOE liner deployed in New Zealand, demonstrating its suitability for local pressure.

## THE PROCESS

### Day 1 – Site Establishment

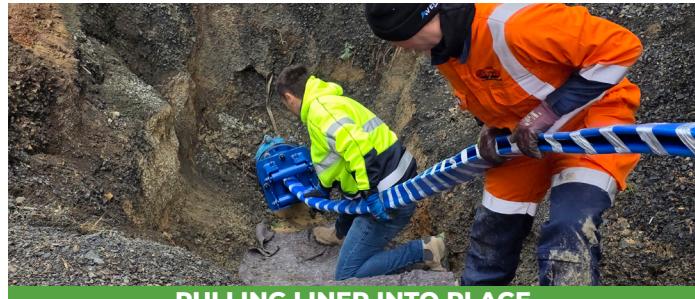
Access pits were excavated at both ends of the pipeline, exposing the existing cast iron/AC main. The pipe was cleaned and prepared for relining, and custom ASOE termination flanges were installed and securely anchored to provide a sealed interface for the liner.

### Day 2 – Liner Installation

The 'W' Series ASOE liner was winched through the pipeline using a cable drum trailer. Care was taken to keep the liner straight and untwisted during installation. Once in place, it was inflated with air to press firmly against the host pipe, creating a tight, leak-resistant seal.

### Day 3 – Testing and Reinstatement

A successful hydrostatic pressure test confirmed the liner's integrity under both normal and peak conditions. With testing complete, the access pits were reinstated, traffic management removed, and the site returned to normal with minimal disruption.



PULLING LINER INTO PLACE



LINER CLAMP AND INFLATION



SECONDARY FLANGE INSTALLATION





LINER/ FLANGE SEALING

## THE RESULTS

**Restored Pressure Integrity:** Verified to 1.6 MPa, exceeding normal operating demand.

**Minimal Surface Disruption:** Rail, highway and local traffic remained fully operational; zero spoil removal.

**Cost & Time Savings:** Avoided deep excavation, utility diversions and extensive reinstatement works.

**Environmental Protection:** Prevented potential leakage near the harbour by renewing the pipe wall internally.

**Industry First:** Sets a benchmark for pressure main rehabilitation in New Zealand using a tight-fit semi-structural hose lining.



SECURING FINISHED FLANGE

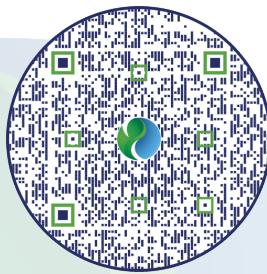
## CONCLUSION

By combining Nuflow Otago's trenchless expertise with PipeTech's (Nuflow Taranaki) ASOE technology, Dunedin City Council achieved a rapid, non-disruptive renewal of a critical hillside rising main.

The project highlights the tangible benefits of semi-structural lining, minimal intrusion, high pressure capability, and extended service life, making it an attractive option for similar pressure pipelines across Aotearoa.

## NUFLOW'S AGING INFRASTRUCTURE MAINTENANCE AND REHABILITATION

For information on how Nuflow can support the maintenance and rehabilitation of your potable water assets, including pressure main relining, concrete pipeline repairs, and trenchless rehabilitation of critical supply infrastructure. Please contact our team of specialists. We're equipped to deliver safe, compliant solutions for even the most complex potable water pipe repair projects.



SCAN FOR MORE INFO



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