

Sewerage Pipeline Raised & Re-levelled

INDUSTRY

Infrastructure

STRUCTURE

Pipeline

PROBLEM

Earthquake remediation

LOCATION

Christchurch, New Zealand

DURATION / YEAR

8 days / 2011

TECHNOLOGY

Uretek Deep Injection

BUSINESS UNIT

Mainmark New Zealand



Summary

This new sewerage pipeline was under construction and was damaged by the earthquakes prior to commissioning. The pipeline was raised back to design levels over 8 days.

Objectives

A 40m long sewerage pipe was under 6m of pre-compacted fill. The pipeline was laid 6m below the road surface level and Uretek Deep Injection method was used to inject engineered structural resin to depths of 7.3m below the pipeline.

Solution

We re-confirmed, supported, provided void fill, raised the pipeline sections back towards design levels and improved the bearing capacity of the supporting, saturated, silty soils to minimise the potential for further settlement.

The ground remediation methodology was used to establish an on-grade laser level as a base line to monitor levels. Injection penetrations were drilled and structural resins were injected to fill voids and confirm uniform support.

Design gradient targets were achieved with correction of up to 68mm of settlement. The ground beneath the pipeline was improved to minimise the potential of further settlement. Because the team could work within the pipeline, there was no traffic disruption and no excavation.

Laser equipment was used to precisely monitor movement, confirm the ground support from Uretek material and to control re-leveling results. Finally, the team stitched the joints around the circumference of the pipes to void fill, support and minimise any ingress of surrounding soils.

Above: 6m below road level a laser leveller guided technicians working in the 900mm Ø pipeline to seal and re-level it after an earthquake.