

# Teretek® Resin Injection Reinforces Twin Culvert in Reclaimed Peat Lands

PROJECT PROFILE

Z19D017

mainmark



## INDUSTRY

Infrastructure

## STRUCTURE

Culverts

## PROBLEM

Sinking and sagging

## LOCATION

Northern Canal area of Hauraki Plains, North Island, NZ

## DURATION / YEAR

3 days / 2019

## TECHNOLOGY

Teretek®

## BUSINESS UNIT

Mainmark  
New Zealand

Above: (Left) Evidence of voids around the culvert's retaining wall. (Right) Accessing the culverts safely for injection was of the utmost importance.

## Summary

Waikato Regional Council (WRC) was seeking a solution to repair twin bore culverts that had sunk and sagged due to poor soil conditions beneath a roadway in the Northern Canal area of the Hauraki Plains, in order to avoid the expense and disruption of digging out and replacing the structures.

The Hauraki Plains consists of alluvial soil built up by sediment from the Piako and Waihou Rivers. Stop-banks (also known as levees) were constructed from locally sourced material to reduce flooding and tidal overflow in the area, with a network of 40m long culverts, running beneath and through the stop-banks to assist drainage. These culverts range from 600mm to 1200mm in diameter.

Due to these conditions, culvert flex or sink was an ongoing issue for the council. WRC had previously remediated, and when necessary, excavated and replaced failed culverts, which was extremely costly to council and disruptive for the local road users.

The Northern Canal culverts pass under a road that is frequented by heavy milk tankers from the local dairy industry, adding further pressure to the structures which lay in clay, gravel and marine mud. The culverts in this area, which had been remediated 15 years prior, had again sunk and sagged.

Following a public tender process, the cost of excavating and replacing the failed culverts was estimated to be up to five times more than the council's allocated budget. WRC sought a more cost effective, efficient and minimally invasive remediation solution to treat the Northern Canal culverts, as well as other compromised culverts in the area.

Council project manager Adrian Morphet contacted Mainmark New Zealand, having previously witnessed the success of culvert remediation by the UK branch of Mainmark using its proprietary resin injection technology.

## Teretek® Resin Injection Reinforces Twin Culvert in Reclaimed Peat Lands continued

### Objectives

Mainmark was asked to identify a solution that would improve the underlying soils and fill any underground voids in order to re-support and re-level one 900mm round culvert, and two 1200mm square culverts in the Northern Canal area.

The site had not been inspected in some years, making it important for Mainmark to quickly and accurately assess ground conditions, and determine the best approach for successful remediation. The proposed solution then needed to be delivered within council budgetary constraints, and undertaken without causing traffic disruptions or road closures that would impact day to day operation of the local dairy industry.

Extreme care was necessary to avoid any impact on local marine life. It was also important that the project followed strict workplace health and safety procedures to ensure the safety of technicians who needed to access confined spaces in order to reach the target treatment zone beneath the roadway.

### Solution

Mainmark's proprietary [Teretek® resin injection](#) solution was ideally suited to site conditions and was substantially more cost effective when compared with the disruptive, expensive and labour intensive process of excavating and replacing the culverts.

Teretek is quick to apply and requires no curing time, avoiding any need for road closures. The engineered resin is environmentally inert, making it safe to use in natural environments with minimal risk to local marine life. It is suitable for most soil types, and can be applied with pinpoint accuracy through small injection tubes inserted into the ground.

A total of 1600kgs of resin was injected into the weak soil surrounding the culverts, through a series of injection points along each metre of the 40m long culverts. When the resin is injected, it rapidly expands, penetrating planes of weakness within the soil profile, filling voids and re-establishing ground support to

re-level structures while preventing water from flowing into unwanted areas.

The culverts were successfully reinforced and the entire project was completed within 3 days, without any disruption to the road or impact on the local dairy business.

The project demonstrated Mainmark's ability to provide an efficient, low impact solution that was significantly less expensive than other treatment options identified during council's initial tendering process and previous remediation works. Teretek is backed with a 50-year product warranty, making it a viable option for delivering a long-term solution for infrastructure maintenance.

Waikato Regional Council were satisfied with the outcome, and project manager Adrian Morphett stated:

*"The product was able to re-align displaced pipe joints in very difficult ground conditions, preventing backflow around the structure. The Mainmark team were very helpful, punctual and carried out the works as planned in a tidy, safe and professional manner."*



The culverts ran beneath a road frequented by heavy milk tankers, further exerting pressure on the sinking structures.