

# Gladstone Steel Drain Refurbishment

## INDUSTRY

Civil

## STRUCTURE

230m x 1.8m Steel Pipe

## PROBLEM

Steel Pipe Corrosion

## LOCATION

Queensland, Australia

## DURATION / YEAR

10 months / 2013-2014

## TECHNOLOGY

ENCAP6™

## BUSINESS UNIT

Mainmark Australia

Right: 1. Test spraying.  
2, 3, 4: Coating on bottom of the pipe completed.



## Summary

A 2mm thick galvanised steel drainage pipe under three factories was heavily corroded, had rusted through at the base and was no longer symmetrical. Council regulations required the structure to have a minimum Class II concrete loading capability – equivalent to 100mm of concrete.

The three factories had been erected above the drain after it was originally built, and as the drain started collapsing due to the weight of surface traffic, it was distorting and giving rise to a raft of regulatory issues.

Gladstone City Council had few alternatives as the surface disruption, excavation cost, cost of renewal and/or diversion of the drainage were prohibitive.

## Objectives

To rehabilitate the pipe - without having to excavate.

## Solution

With the help of Mainmark's advanced ground engineering systems and ENCAP6™ coating materials, it was possible to cost effectively rehabilitate the entire structure. The overall solution presented to the Gladstone City Council involved:

- A feasibility study: Newcastle University handled the finite element analysis to calculate the loads and overall strength of the ENCAP6™ reinforced pipe.
- Injecting structural expanding resin behind the pipe structure into holes drilled through the pipe every 50cm (all around the pipe) to realign the entire length, remediate the soil and structurally support the pipe.
- Re-filling the washed out areas at the base of the pipe, which had been eroded, with fast setting cement.
- Coating the base of the pipe with a 12mm layer of glass reinforced ENCAP6-950 fabric laminate.
- Spraying a 16mm layer of ENCAP6-950 onto the sides and roof of the pipe.

This solution presented a compelling value proposition.

Russell Groth, Mainmark Business Development Manager said, "The City Council had very few alternatives. The cost of replacing the pipe or diverting the drainage would have been prohibitive and would have involved considerable surface disruption. We were able to rehabilitate the pipe for a fraction of the cost. This coating material is extraordinary."

William Lindsay, Mainmark Civil & Mining General Manager said: "This is a fantastic result for Gladstone. The Council is impressed by what has been achieved on this project."