

Stacker Crane Rail Re-levelled

INDUSTRY

Mining

STRUCTURE

Stacker-Reclaimer Rail

PROBLEM

Sinking Rail

LOCATION

Queensland, Australia

DURATION / YEAR

8 days / 2015

TECHNOLOGY

Uretek Slab Lifting & Uretek Deep Injection

BUSINESS UNIT

Mainmark Australia

Far right: Pneumatic DCP testing to determine injection depths.



Summary

The giant stacker gantry crane rail was one kilometre in length. Crane access to the coal stocks was limited by subsidence of one of the rail footing beams running down either side of the coal stack.

Mainmark treated the areas of subsidence, by injecting Uretek expanding structural resin under the rail beam.

The beam was re-supported and lifted back to level, so that the client regained access to the entire coal stock.

Objectives

The objective was to re-level the crane rail by re-supporting and re-levelling the concrete beam supporting it.

Solution

The reinforced concrete beams were one metre thick and three metres wide and had been built on general fill material, approx. eight metres deep.

Prior to the construction of the rail beam, areas of the nonhomogeneous fill material had been identified, removed and replaced. In the 21 months since construction of the beam, more settlement issues had arisen. Excessive deflection of the rail beam had

developed under load. The joint between two slab sections had undergone settlement of 81 millimetres.

Geotechnical investigation via DCP and seismic testing indicated soft spots in the ground from two metres to six metres deep.

Commissioned by the site engineers, Mainmark treated a section approximately 15 metres either side of the slab joint. Expanding structural resin was injected under the rail beam at depths of 2.5, 3.5 and 4.5 metres, as had been determined by pneumatic DCP tests. Injections were made through the centre of the rail beam, at either edge of the three metre wide beam and at one metre centres along the beam.

The beam was lifted back to level; and with several passes of the stacker crane, full support was shown to have been re-established.

Testing also indicated another area of soft ground at the start of the rail line. The slab beam there was 1.5 metres thick and was showing some signs of minor deflection. Very soft ground was found between 2.5 and 4.5 metres down, so structural resin was injected to compact and strengthen that area as well.

On completion of the project by Mainmark, the client regained complete access to the significant stock of export coal.