PROJECT PROFILE
P14 U116

mainmark

ROM Bridge Embankment Rehabilitated

INDUSTRY
Mining

STRUCTURE
ROM Bridge

PROBLEM
Sinking bridge

LOCATION
Queensland, Australia

DURATION / YEAR
21 days / 2014

TECHNOLOGY
Tampur 117

BUSINESS UNIT
Mainmark Civil & Mining

Summary

Mainmark carried out a complete rehabilitation of the ROM bridge embankments at a coal mine-site. With the mine operations closed for 30 days, Mainmark cleared vegetation and injected an expanding resin in a grid pattern, into the voids, between the existing veneer of shot-crete embankment lining and the soil embankment below.

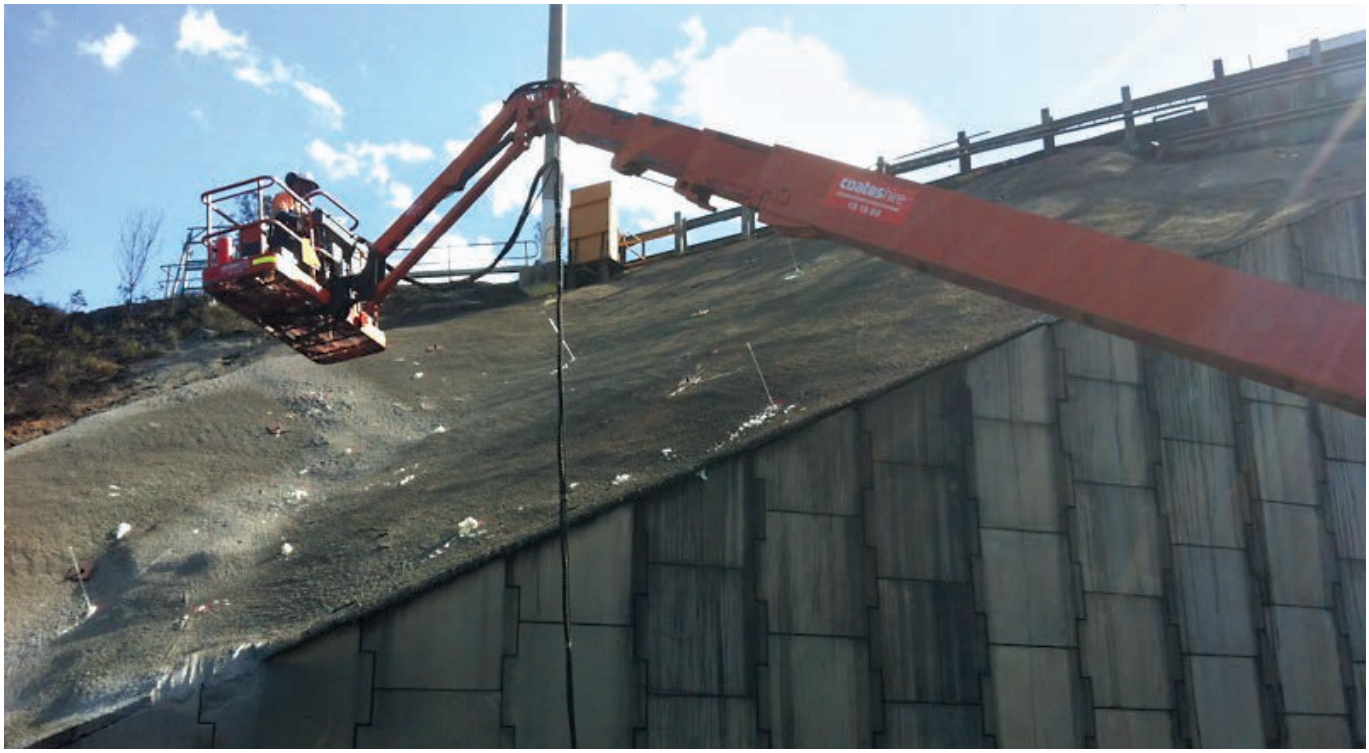
Mainmark installed a resin injected anchor system, installed re-enforcing mesh and then applied fibre strand impregnated shot-crete to damaged areas of the embankment faces.

Objectives

To re-instate the integrity of the ROM bridge embankment and to mitigate the effects of weather and the extremely heavy loads carried by the bridge.

Solution

1. Mainmark cleared all vegetation from the existing shotcrete area of the four ROM bridge slopes using specialised saws and elevated work platforms (EWP).
2. Structural grade expanding resin was injected through a grid pattern of drilled holes to fill voids between the existing veneer of shot-crete lining and the soil embankment below. This increased the connection between the slab and the lining and provided mitigation of hydraulic weathering and erosion of the sub-grade and improved the uniformity of support between the lining and soil.
3. An anchor system was installed in each of the four embankments. 5-metre-deep hollow drill rods were used and resin-grout filled which created the anchor points.



The 10 anchors in each embankment were secured with 300mm x 300mm steel face-plates.

4. Re-enforcing mesh was installed in the cracked and weathered areas of the existing shot-creted embankment linings and re-enforcement bars were driven in 1000mm deep. 600mm wide re-enforcing mesh was applied to the trailing edges of all four shot-crete linings and a connecting edge was installed from the top of the slope to the ROM abutment slab, to provide drainage away from the area.
5. Fibre strand impregnated shot-crete was installed to the damaged areas of the faces of the existing shot-crete linings, including the trailing and top edges, to improve water shedding.
6. A geofabric and rock-filled drain was installed across the roadways from each of the four embankments. 40 weep holes were installed in the embankment face, using 50mm to 75mm PVC inserts grouted into place.

Establishment and dis-establishment each took a day and the actual operations were completed over a 21-day period.

The integrity of the four embankment slopes was fully restored with measures taken to mitigate future erosion, degradation and eliminate the ‘failing object” risk that the site faced due to the slippage of the shot-crete.