Case Study

Slope Stabilisation

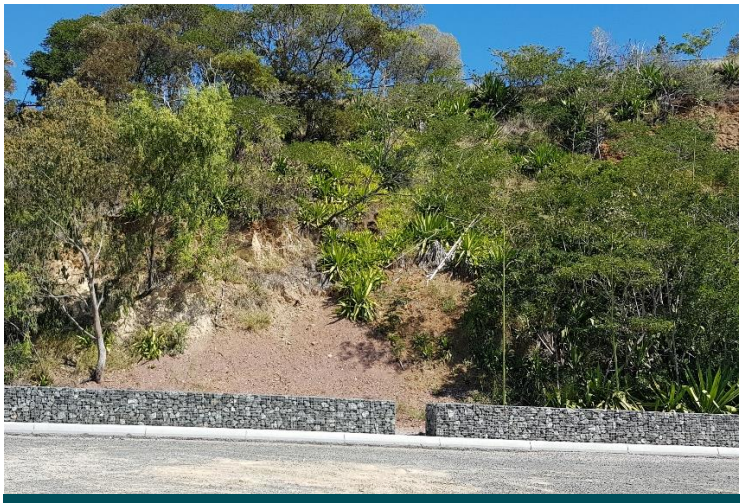
Project:	Auckland Hill, Area 3 Slope Remediation
Date:	May 2020
Designer:	Coffey
Installer:	Ground Stabilisation Systems (GSS)
Location:	Gladstone, Queensland

GEOFABRICS AUSTRALASIA PTY LTD

Slope Stabilisation – Macmat R

Coffey Services Australia Pty Ltd (Coffey) was engaged by Gladstone Regional Council to undertake a general slope stability assessment and a detailed design of remedial measures for one of the slopes (namely Ärea 3") at Auckland Hill in Gladstone, Queensland. Situated at the entrance of the harbour, Auckland Hill is a Council reserve predominantly utilised as parkland.

In early 2008 significant rainfall in the Gladstone region preceded a landslip on the eastern side of Auckland Hill, north of the Gladstone Ports Corporation (GPC) owned workshop and directly adjacent to Bishops Drive. This slip is encompassed within Area 3. The area of instability is still mostly bare, or with sparse vegetation, suggesting that the instability is still active, potentially in the form of unravelling and slumping.



The Slope At Area 3 Prior To Remediation

The scarp associated with the existing instability is a steep cliff face (approximately 70°) that is ~45 m wide, has a maximum height of ~20 m in the northern section, tapering to ~2 m height in the southern section. The exposed rock is highly weathered mudstone/ arenite with moderately spaced sub-vertical defects. These are cross cut by low angle joints, forming blocks that have become loose and fallen from the slope. The joints are generally tight (rock-rock contact) to slightly open, rough, and weathered to form a distinct orange iron oxide or silt infill.

Some scrub vegetation has become established on the older debris material, and around the cliff exposure. The slope angle on the lower slope below the steep cliff face is approximately 25 - 40°.

The landslip has caused some tension cracking in the road pavement, which was also evident in a previous investigation carried out by Coffey following the 2008 slope instability event. Observations however indicate that these cracks have not lengthened or widened significantly since the 2008 event.

Due to the significant difficult access requirements a specialist installer (GSS) was engaged by GRC to carry out the works to the highest quality.

GSS Drilling Anchors On The Slope

Case Study

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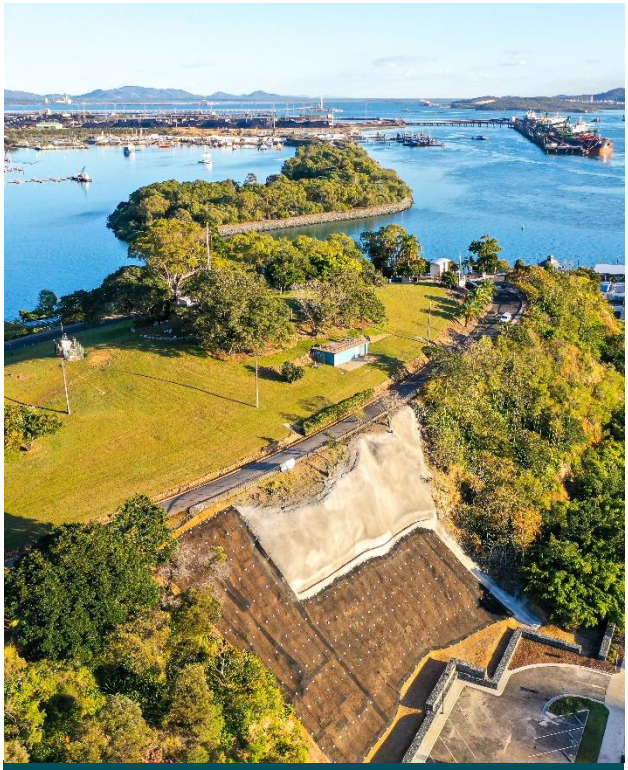
The Anchored Macmat R On The Lower Slope And Shotcrete On The Upper Slope



The Completed Project Prior To Hydroseeding

The remediation of Area 3 was carried out by Ground Stabilisation Systems with a combination of the following:

- The localised regrading of the slope and removal of loose rock blocks, cobbles, and boulders on the slope
- The installation of shotcrete at the upper part of the slope and Maccaferri Macmat R (a reinforced geomat made from a polymeric three-dimensional matrix extruded onto a double twisted steel wire woven mesh) at the lower part of the slope in order to retain unstable cobbles, boulders and rock wedges
- The installation of soil nails to improve global and local slope stability
- The construction of a spoon drain at the crest of the exposure to capture and divert surface water flow away from the exposure face
- The construction of sub-horizontal drains to capture and divert groundwater away from the exposure face
- Application of hydromulch to the Macmat R to promote vegetation establishment in accordance with the CMDG Lanscaping C273 Specification (Table C273.06.1)

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