

## MUGGA LANE LANDFILL SYMONSTON, ACT, AUSTRALIA

### ENVIRONMENTAL/HYDRAULIC ENGINEERING/MATRESS CHANNEL LINING

#### Product: Maccaferri Galmac+PVC Coated Gabion and Reno Mattresses

##### Problem

The previous batter drain lined with loose rock was completed in about January 2007. This drain was damaged extensively during a storm event on 18<sup>th</sup> December 2007. The batter drain which is quite steep, has a 20% fall, is 5 meters wide and was originally lined with 250mm  $\varnothing$  large rocks underlain with a non-woven geotextile. Due to the high velocities generated by the flow, the loose rocks were transported down the drain and deposited at the steepest section which caused a blockage of the drain itself. The condition for initial movement for loose rock (rip rap) is a limit condition. A small force beyond this seems to have caused the complete destruction of the lining progressively.

##### Solution

Maunsell approached Maccaferri to conduct the preliminary hydraulic analysis of the batter drain utilising Gabions and Reno Mattresses. The design suggestion was carried out using the Maccaferri MACRA 1 software. Gabion Mattresses (6x2x0.5) were specified at the base of the channel section where the velocities and shear stresses (tractive forces) were expected to be the highest. Castoro Reno Mattresses (6x2x0.30) with a double internal diaphragm at 1m centres were specified on the sides of the channel. Geomac 330 non-woven geotextile was used as the separation layer beneath the Mattress protection.

Due to the ability of the Gabions and Reno Mattresses to accommodate differential settlements and the fact that the lacing system ensures the lining is monolithic, this option was considered to be the most applicable. In the case of the Reno mattress and Gabions, after the initial rock fill movement the woven mesh continues to offer total confinement of the rock. The mesh may deform slightly, but it will allow for more severe conditions without compromising the resistance; unlike loose rock.

Galmac (95% Zinc 5% Aluminium Mischmetal Alloy) + PVC Coated units will ensure that the structure would fulfil its design life requirement.

Client name:

THIESS SERVICES

Contractor name: Gabion Sub-Contractor

WODEN CONTRACTORS EARTHTEC

Consultant:

MAUNSELL

Product used:

GALMAC+PVC COATED GABIONS AND RENO UNITS

Construction date:

APRIL 2008



The Storm Damage To The Loose Rock

Date: Jan 2008



Loose Rock Washed Down The Channel

Date: Jan 2008



Close Up Of The Damaged Loose Rock

Date: Jan 2008

