



CASE STUDY:

BOOLAROO BATTER STABILISATION WORKS

**DESIGNER: REGIONAL GEOTECHNICAL
SOLUTIONS PTY LTD**

**CONTRACTOR: GROUND STABILISATION
SYSTEMS**

MACMAT® R

MacMat R is a mesh reinforced three-dimensional geomat that can be applied as an erosion control mat for sloped embankments, channel linings and soil-veneer applications. It was developed to meet the need for permanent erosion control material which was both strong and environmentally acceptable.

MacMat R turf reinforcement matting is a unique composite material of MacMat and Maccaferri's double twist hexagonal woven mesh reinforcement.

The double twist mesh provides resistance to rupture of the geomat on steep slopes when soil filled as well as improving the efficiency of soil anchors.

In a residential subdivision in Boolaroo, a two-level cut slope reached maximum heights of approximately 8 m to 10 m. Due to the maximum height reached, the slope was excavated as two batters separated by a mid-level bench. The measured batter angles ranged from 31 to 34 degrees, or approximately 1V:1.5H. The batters exposed highly weathered sandstone, with beds of carbonaceous clay and weathered coal, with a gentle dip into the slope face (<5 degrees). The batter surfaces were vegetated by grass that had been established by spray-seeding the exposed face.

The erosion of seed and grass from the surface was evident, due to the batter angle and lack of holding medium on the surface. Minor rockfalls were evident in the lower batter, where small rock blocks had been undercut by erosion. The upper batter face revealed minor rill erosion and early-stage fretting, but no rockfalls were observed.

A three-dimensional turf reinforcement mat (TRM) made of continuous monofilaments fused at their intersections was specified for the upper batter and bench. Ninety-five (95%) per cent of the TRM is open and available for soil, mulch and root interaction, creating the most effective root reinforcement mat available. This is suitable for areas where there is a requirement for erosion protection, but not expected to be any slope stability issues.



The eroding slope before the installation.



The slope after installation of MacMat® R prior to hydroseeding.



Six weeks after the MacMat R was installed - extensive vegetation establishment after hydroseeding.

Maccaferri MacMat® R was specified for the lower batter where an increased tensile strength and punch resistance was required to support potentially loose soil and rock. Maccaferri MacMat® R is a three-dimensional, permanent geomat that provides surface reinforcement, stops erosion and promotes revegetation. An integral woven steel mesh reinforces the geomat, significantly increasing its tensile strength (up to 54kN/m) and punch resistance (up to 67kN), enhancing its erosion protection ability and shear resistance capacity when compared to unreinforced erosion protection mats.

MacMat® R consists of a matrix of UV stabilised polymer fibres, extruded onto Galmac (Zn95%/Al5% alloy) coated steel mesh (with or without additional polymer coating) during the manufacturing process, to form a unique, one-piece geocomposite mat for ease of installation.

The reason the three-dimensional polymer fibre component of the MacMat® R is a turf reinforcement mat is to reinforce the root structure and not just provides raindrop impact protection or a surface lining function. Unlike other steel mesh composites, MacMat® R can be buried/covered as the additional Polimac® coating protects the steel mesh long term against chemicals typically found in soil.

MacMat® R can be also be supplied using green or brown polymer fibres.