

Project: Coramba Road
Date: October 2015
Client: Ground Stabilisation Systems
Location: Northern NSW



Steelgrid HR in Northern NSW

Following heavy rainfalls in 2013 a large slip occurred above and below Coramba road in Northern NSW. Interim work consisted of soil nailing and a shotcrete façade below the road to allow the reopening of a single lane road. To reinstate the two lanes the road needed to be widened by five metre which meant re profiling the slope from the existing 30 to 45 degrees to a 65 degree slope.

The upslope area consisted of soil areas formed from residual silty clay and extremely weathered (XW) argillite and a rock area formed from variably weathered argillite.

The initial design consisted of pinned drapery system consisting of Glass Fibre Reinforced plastic (GFRP) soil nails, rock anchors, a turf reinforcement mat (TRM) and 3mm single twist high tensile steel collapsible mesh. A crest drain was also to be installed to intercept stormwater runoff.

Due to the high material costs of the single twist mesh the contractor contacted Geofabrics in regards to supplying suitable alternative products.

Geofabrics Australia proposed Maccaferri **Steelgrid HR 30** and **Enkamat 7018**. **Steelgrid HR30** has a longitudinal tensile strength of 177 kN/m and achieves this strength at much lower strains than the nominated single twist collapsible mesh. The **Steelgrid® HR** mesh is a composite of double twisted steel wire hexagonal mesh with high tensile strength steel cables, woven into the mesh during the manufacturing process. The **Steelgrid** mesh is coated with a minimum 245gsm 95% Zinc 5% Aluminium alloy. This equates to a Class A coating as per EN 10244-2.

The **Enkamat 7018** geosynthetic is superior to the specified TRM in terms of open void space and soil retention factor, and has the added advantage of being manufactured using polyamide, which is a self-extinguishing polymer.

The contractor also engaged its own consultant to assess the flexible facing alternative. The consultant utilised Maccaferri software MacRo1 with the same rock nail configuration as the initial design which showed the **Steelgrid HR 30** achieved the required factors of safety. The consultant also assessed the durability of the **Steelgrid HR 30**



In terms of the required design life according to AS4534-2006 and was deemed to achieve the required 50 year design life.

The soil nailing component of the works consisted of 25mm and 32mm GFRP with nail lengths ranging from 8.5m to 11m at 1.5m vertical and 1m horizontal spacings. While the rock anchors consisted of 32mm GFRP with 5.5m lengths in a 2.1m by 2.1m pattern.

The project consisted of 1200m² of slip repair with the experienced contractors finding the Steelgrid HR and Enkamat very easy to work with. Even with the additional consultancy fee the client and contractor were able to make savings on material costs for the project.



How Rockfall Protection Systems work.

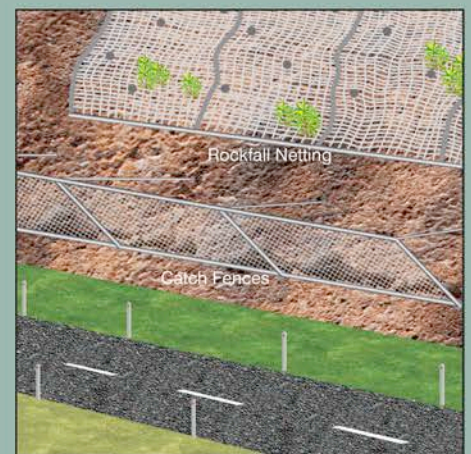
Rockfall protection systems are a crucial element in the design and maintenance of road and railway infrastructure networks and keep users safe from unstable rock slopes.

It's important to make a distinction between the different types of **Rockfall protection systems** and ensure the most suitable system is selected.

Secured drapery and surface stabilisation systems are designed to work in conjunction with anchorages, to increase the stability of the unstable surficial layer of the rock slope. The stiffer the mesh, the more effective it is in limiting propagation of the instability.

Passive systems (draperies, catch fences and rockfall embankments) do not affect the process of rock detachment. Instead they focus on containing and intercepting falling and sliding debris, and thereby averting any danger for road or rail users.

Geofabrics offers a range of **rockfall protection systems**, including hybrid, attenuator and debris flow barriers and supports our systems with design advice and installation support.



Rockfall Protection Systems