



GEOFABRICS CASE STUDY



UMINA ROCKFALL MITIGATION WORKS PROTECTS RESIDENTS & PROPERTY

PRODUCTS USED

MACCAFERRI® DYNAMIC ROCKFALL BARRIERS (CATCH FENCES)

- Positioned to intercept and stop falling rocks and boulders on steep slopes
- Designed to deflect under load and absorb energy, with a range of certified fences available from 35kJ to 9000kJ
- Cost effective when installed within the transit or impact zones which can present technical, topographic or access issues for other mitigation systems
- Full scale crash tested and certified in accordance with the European Organisation for Technical Approvals (EOTA) assessment documents EAD 340089-00-0106 and EAD340059-00-0106
- Design support provided including access to an advanced suite of software free to our clients and on-going in-house training or via seminars



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PROJECT DESCRIPTION

The Central Coast Council Umina Rockfall protection project involved stabilisation works for a natural sandstone escarpment that posed a rockfall hazard to dwellings at the base of the slope. The area assessed by the designer was approximately 180m in length and comprised an east facing sandstone escarpment, approximately 30m in height. The site is bounded by residential blocks both above and below the escarpment.

OUR SOLUTION

The site contained a sandstone escarpment with two levels, a 12m high lower escarpment face and an 8m high upper escarpment face, separated by a 4 to 6m wide bench. Typically, escarpment faces are steeply inclined at 75° to 90°, while the colluvial slopes dip down at angles between 30° to 45°. The slope gradients decreased to the north of the site between 25° to 30° with the sandstone escarpment heavily jointed with subvertical to vertical joint sets, which is common in Hawkesbury Sandstone as a result from the uplift of the Sydney basin and hydrostatic relief.

Rockfall trajectory analyses were undertaken by GHD designers using 0.5m and 1m boulders with a mass of 300kg and 2400kg respectively. From the results of the analyses, a rockfall barrier with a minimum energy capacity of 500kJ was suggested as a mitigation option. Due to its ease of installation, cost-effectiveness, and performance in terms of residual height and deflection during impact, the Maccaferri RB750 (750KJ) was selected as the rockfall barrier of choice for the project. This barrier has been full-scale crash tested to meet the requirements of the European Assessment Document (EAD) 340059-00-0106.

Ground Stabilisation Systems (GSS) installed the 120m long rockfall barrier in September 2022 using drill rigs for anchor installation and handheld tools for the rockfall barrier assembly. Technical assistance was provided to the installer by Geofabrics to ensure the barrier met the design requirements and was installed as per the guidelines.

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Sustainable solutions

Rockfall barriers are widely used to mitigate rockfall risk by protecting valuable assets and critical infrastructure such as roads and railways, mining areas and construction sites. They are passive mitigation systems as they do not affect the source of rockfall event, but rather arrest the rock masses by dissipating their falling velocity and energy, preventing them from reaching vulnerable areas.

Barrier full-scale tested to meet **EAD** criteria



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Sustainable solutions

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