



GEOFABRICS CASE STUDY



ROCKFALL PROTECTION AT ALPINE RESORT WITH STEELGRID HR & GRASSROOTS

PRODUCTS USED

MACCAFERRI® STEELGRID® HR ROCKFALL NETTING

- A high strength composite netting or drapery system that combines the versatility of double twist mesh with the stiffness and mechanical durability of high tensile steel wire ropes
- Can be used in both simple drapery or pinned drapery systems including slope stabilisation, rockfall protection and surface protection applications
- Available in a range of system tensile strengths ranging from 50kN/m up to 180kN/
- Different levels of coating protection for durability; wires and ropes are coated with Galmac® galvanising to Class A level and can be additionally coated with a thermally bonded layer of polymer coating
- Reduces the stress on the mesh by its ability to transmit loads directly to the top anchors
- Flexible and versatile to match existing slope and rock profiles

GRASSROOTS® SYNTHETIC EROSION CONTROL MAT

- Made from heavily UV stabilised synthetic fibres which are needle-punched together into an open weave three-dimensional structure
- Designed to offer a permanent engineered solution that assists the establishment of vegetation even in extreme environmental conditions
- Proven UV resistance due to stabilised fibres, ensuring no degradation from exposure to sunlight and no loss in tensile strength

PROJECT DESCRIPTION

Cardrona Alpine Resort is located between Wanaka and Queenstown in the Southern Alps of New Zealand. It is a renowned ski resort that operates year-round, attracting skiers and snowboarders with its dry powder snow and wide slopes during the winter months. In the summer, the resort offers a variety of activities, including mountain biking, gondola rides, hiking and mountain carting.

A popular mountain bike trail at the resort, called Lee's Leap is situated at the toe of a 250-metre-long rock slope that varies in height between 30 to 90 metres, with an average slope angle of 60 degrees. At the site, unstable fractured surface rocks ranging in size from a tennis ball to a rugby ball posed a risk to visitors. To minimise this threat, the specialist contractor, CliffCare lightly scaled the rocks.

In addition to the scaling operation, further rockfall protection works were identified to enhance the safety of mountain bikers using the trail. The most critical portion of the slope, approximately 70 metres long, required simple drapery meshing to cover the slope and control rockfalls.

OUR SOLUTION

Geofabrics New Zealand was contacted to provide a drapery mesh solution to mitigate the hazards. Utilising Maccaferri Macro software, a design incorporating Maccaferri Steelgrid HR rockfall netting with rope integration at 500mm intervals was identified for the project. To determine the most suitable mesh type, several factors were considered, including estimated rock sizes, height of slope, assumed debris volume, snow thickness and anchor spacing. The Macro software also identified the crest anchorage load and top rope diameter requirements.

To prepare the site for the rockfall protection works, vegetation at the crest of the slope was cleared to create a level surface. This was followed by the installation of crest anchors at the designated spacing. The crest rope was then connected to the anchors, and the Steelgrid HR50 mesh was installed.

The top connection between the mesh and the crest rope was completed using the D20 shackles.

Alongside the Steelgrid HR50 mesh, the client requested a mat product solution that was UV-resistant and durable enough to withstand windblown dust. Grassroots synthetic erosion control mats were suggested for its durability, having undergone real-time UV exposure testing over a 10-year period. These Grassroots mats were later laced on top of the Steelgrid HR50 mesh.

In total, approximately 3,200 m² of Steelgrid HR50 mesh and Grassroots mat were installed to mitigate the rock fall hazards and control dust. This enabled the re-opening of the trail for mountain bikers during the summer months.

Total coverage of
3,200m²

Effective
rockfall mitigation



ERIC EWE
TECHNICAL BDM SLOPES & WALLS

☎ +64 21 397 456
✉ e.ewe@geofabrics.co.nz
📍 Auckland, NZ



Visit [geofabrics.co](https://www.geofabrics.co) or call 1300 60 60 20 (AU)
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