

PERTH QUARRY REDEVELOPMENT PERTH, AUSTRALIA

ROCKFALL PROTECTION

Product: Steelgrid MO

Problem

A disused quarry in Perth was proposed to be redeveloped. The existing open-cut quarry had side walls generally sloping between 50° and 75° with heights of up to 45m. The approximately planar quarry base fell away towards the quarry entrance. The existing side walls are blocky in nature with numerous small ledges, often supporting boulders and cobbles. The grey brown granite gneiss with significant dark grey dolerite intrusions are generally striking northward and dipped steeply (55°-65°) leading to their instability. Localised recent rockfalls from the north-west quarry wall were assessed to require remedial works to stabilise them to reduce further risk to the future development of the quarry.

Solution

Remedial actions consisted of the scaling of loose rock debris and the installation of rockfall drapery netting on key unstable areas of the upper quarry face. The purpose of the drapery is to act like a curtain, hanging over the face of the rock slope. Any rock debris that detaches from the face of the rock slope will be captured by the mesh, and it will fall harmlessly and in a controlled manner to the foot of the slope behind the mesh.

When large quantities of debris are expected over long slope lengths, the tensile strength of the mesh becomes important.

The Project Managers, worked with Geofabrics / Maccaferri Australasia, to develop a suitable solution for the drapery system. Based on the quarry slope length, angle and irregular strata conditions, **Steelgrid MO** was selected as the most appropriate drapery system.

Maccaferri's MacRO Design Software enables designers to optimise the strength and type of mesh required, specifically for the problems they face. This offers clients an efficient and cost effective installation rather than a 'one-size-fits-all' approach.

Steelgrid MO is a geocomposite comprising of double twisted woven mesh with high-tensile steel cables incorporated into the mesh twists during the manufacturing process. The cables provide effective strength transfer to the upper anchors during a rockfall event, or when retaining rock debris.

Main contractor:

THE RIX GROUP

Designer:

GEOFABRICS / MACCAFERRI AUSTRALASIA

Products used:

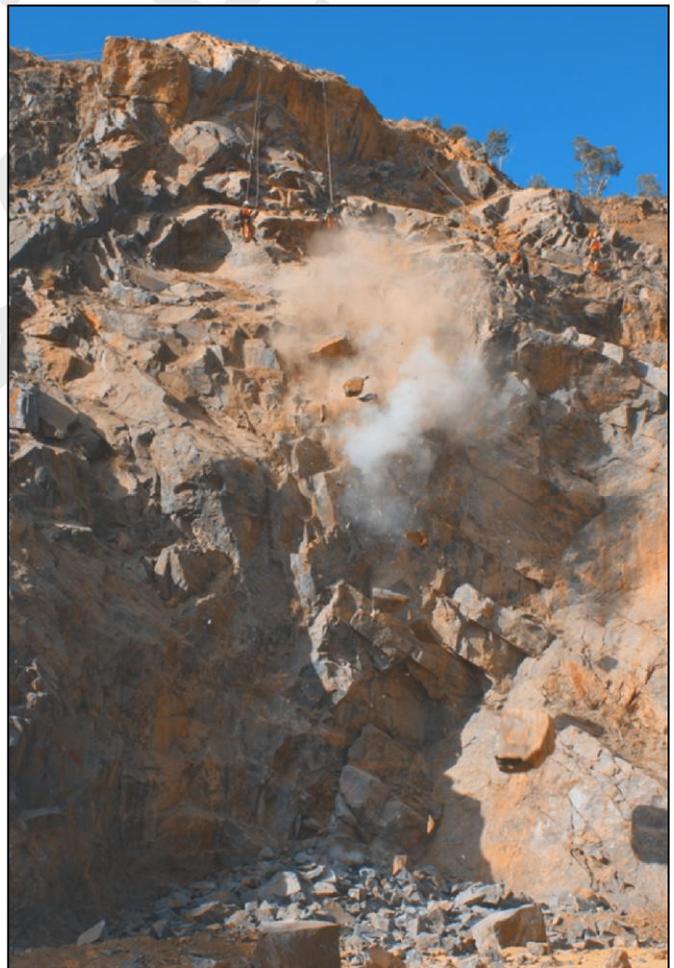
STEELGRID MO

Date of construction

May 2010



Existing quarry, showing face instabilities



Removing debris prior to drapery installation



Flexibility of Steelgrid MO allows good adherence to cut face

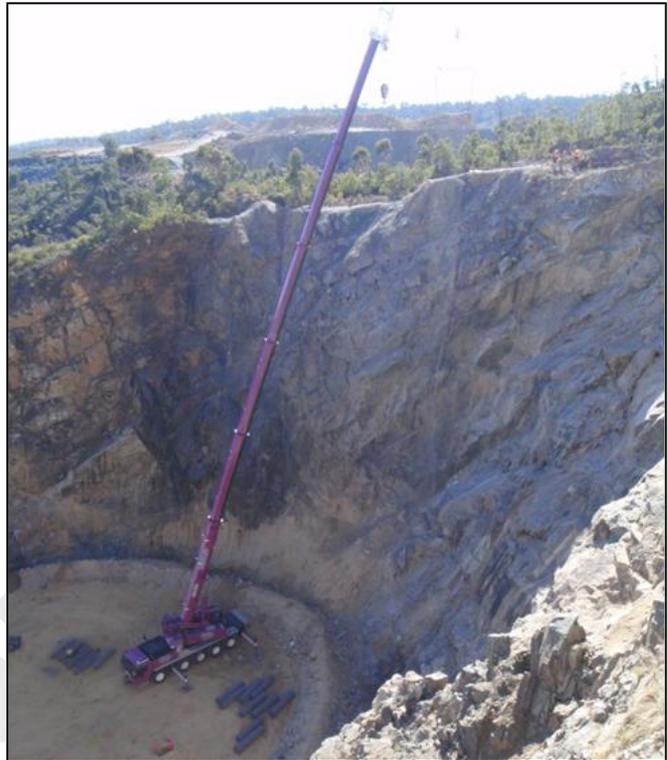
Compared to high tensile strength single twist “chain link” style meshes, Steelgrid provides high strength at low strain. It conforms to the rock slope more easily and if wires within the mesh are broken due to rock impact or damage, the Steelgrid double twist mesh does not unravel like a single twist “chain link” style mesh. Thus, in the unlikely event that the Steelgrid mesh is damaged, it continues to offer rockfall mitigation.

Geofabrics / Maccaferri Australasia can provide ‘turnkey’ solutions for these projects with specialised recommended installers. Subsequently, **The RIX Group**, specialising in the full range of geotechnical applications from tunnels, rail works, specialised drilling, rockbolting, rockfall netting, rock catch fences, soil nails and shaft linings were awarded the installation contract.

20mm dia. galvanised anchors of varying lengths were used at the crest, bottom and sides of the drapery area. Top and bottom cables support the mesh and the debris contained in the mesh on the slope face. The 4,400m² of Steelgrid MO installation, including drilling and installing anchors, was completed in just over 3 weeks, proving that this high strength, low strain drapery mesh installs almost as easily as the eponymous traditional Maccaferri rockfall netting!

The project management team commended Geofabrics/ Maccaferri Australasia and The RIX Group on the outcome of the rockfall protection component of the project.

Geofabrics / Maccaferri Australasia rockfall drapery systems are manufactured to the highest international standards and have been successfully used throughout Australia for more than 40 years from remote Western Australian mines to east coast parklands.



Installation using long-reach crane



Steelgrid MO draped over face and adjacent panels connected



Steelgrid MO panel-panel connection detail

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