

## Clifton Hill and Moa Bone Point

### Geotechnical - Rockfall Protection

Location: Clifton Hill Christchurch  
Date: April to September 2016  
Client: Fulton Hogan  
Principal: Christchurch City Council  
Consultant: Golder Associates, Christchurch

During the Christchurch Earthquakes in 2011, the cliffs at Clifton Hill & Moa Bone Point experienced significant ground shaking and as a result a large amount of material was lost due to cliff collapse & mass movement. As these sites are directly above the Sumner to Lyttelton Corridor, mitigating the rockfall risk to traffic along Main Road was essential.



Abseil Access were contracted by Fulton Hogan to carry out the cliff stabilisation works:

- Removing vegetation to gain access to the site & cliff face
- Light, moderate & heavy rock scaling with airbags & crow bars
- Removal of 24m<sup>3</sup> rock columns
- Supply & install 3400m<sup>2</sup> of draped Geofabrics PVC coated double twist rockfall netting
- Install face anchors at locations determined by the Engineer
- Installation of rock bolts to support potentially unstable blocks.

Working above a live road with traffic volumes of 20,000 vehicles per day the strict traffic management plan allowed for short duration 5-minute road closures. A helicopter was used to lift the 45 rolls of rockfall netting to the top edge of the cliff, which allowed the abseilers to position the netting directly on to the top cable - reducing the need for manual handling of the 170kg rolls. The netting was secured with a 19mm diameter galvanised wire cable.

The work was completed within the allocated timeframe and allowed the removal of the shipping containers after 5 years providing protection to traffic along Main Road.

