

SH73 BELOW STARVATION POINT BETWEEN OTIRA GORGE & ARTHUR'S PASS, WEST COAST, NEW ZEALAND

Debris Flow Barriers

Problem

State Highway 73 (SH73) is a major motorway connecting the regions of Canterbury and West Coast. It provides access to many recreational sites such as ski fields during the winter season.

SH73 is recognized as vital to the economic well being of the West Coast region due to increased traffic movements since opening of the highway.

The site "Below Starvation Point" is located in the Otira Gorge on SH73, approximately 8 km north from Arthur's Pass township. The site is essentially a debris channel estimated to experience large volume debris flows (50 - 100m³) during periods of high rainfall intensity. The debris flow contains rock sizes between 0.4 - 1.0m diameter.

The site scores as high risk under the current NZTA Rockfall Hazard Rating system and requires immediate rockfall protection solution to be in place to keep road users safe.

Solution

The client had accepted a proposal to install a debris flow fence (without posts) with the capacity of capturing 300m³ debris volume accumulated from consecutive debris flow events.

The debris flow fence considered both dynamic and static components of the imposed pressure by the debris flow; these component loads are then distributed to the ring net panel which in turn transmits the load to the longitudinal cables. The cables will activate the energy dissipators and finally transmits the load to the lateral anchors. Double spiral rope anchors type ICAF 44/22 were installed up to 10.0m lengths into the ground.

The debris flow barrier components used were tailored to offer maximum strength and durability whilst remaining easy to handle and practical to install. The primary interception mesh adopted (high strength ring nets); and the energy dissipators adopted for this project are the same components used for the 5,000kJ dynamic barriers.

There were subsequent debris flow incidents reported after completion of barrier installation. The barrier successfully prevented any debris from intruding into the motorway. The barrier components was inspected after the impact and no part replacement is required.

Client: NZ Transport Agency (NZTA)

Designer / Consultant: Opus International Consultants Ltd

Contractor: Geotech Ltd

Products used (Qty.)

- Debris Flow Barriers 33m²

Date of construction: 02/2016 - 04/2016



Before installation of debris flow barrier



Longitudinal cable installation



Debris flow fence nearing completion