

### DEBRIS FLOW BARRIERS

LOJING, GUA MUSANG, KELANTAN, MALAYSIA

#### MACCAFERRI ROCKFALL PROTECTION SYSTEM (MAC.RO.™)

#### Product: DEBRIS FLOW BARRIER 3000kJ

##### Problem

In 2008, an incident of debris flow with approximately 4,000m<sup>3</sup> of mud soil had flowed down hill to highway of Sections 62-4 to 62-8 along Simpang Pulai Road (Laluan FT185) in Lojing, Gua Musang, Kelantan. The height from toe to the debris source was about 260m, with slope gradient ranged from 20° to 35°.

It was anticipated that the risk of debris flow re-occurrence at the same location was high and estimated to be 5,000m<sup>3</sup> in volume. Hence, the Authority was looking for engineered barriers to be installed along the anticipated flow path to retain or retard the debris flow, in order to minimize the risk of debris reaching the highway.

##### Solution

Maccaferri had proposed flexible debris flow barriers with energy capacity of 3,000kJ to be constructed at 3 locations along the flow path. At the final point, a gabion embankment was constructed at the slope toe.

The barriers which consist of high strength yet flexible steel cables netting were connected with series of specially designed energy dissipaters to absorb the forces during big impact. In general, the flexible barriers will allow high velocity hydraulic flow (mud slurry) to pass through the netting, while catching the harmful larger-mass objects. Nonetheless, it will also act as check dams to reduce velocity of the fast flowing mud slurry. The final volume of the mud slurry that go through the flexible barriers will be constructed by the gabion embankment at the slope toe and channeled to the drain.

The length of the flexible barrier at each location was about 30m across the flow path, with maximum height of 5.5m post. It took about 3 months to construct the flexible barriers at the 3 locations.



Before construction



During construction



After construction

##### Client:

JABATAN KERJA RAYA GUA MUSANG

##### Main contractor:

SERASI VENTURE SDN BHD

##### Products used:

MACCAFERRI DEBRIS FLOW BARRIER 3000kJ

##### Date of construction:

OCTOBER - DECEMBER 2011



3 Monts After Completion



3 Months After Completion