# ROCKFALL MITIGATION WORKS- CS DAM TOP-TEESTA STAGE-III HEP, SIKKIM

## CHUGTHANG VILLAGE, SIKKIM, INDIA

Dynamic Barriers

**Problem**

The Teesta Stage-III HEP(1200 MW) is located along Teesta river in the Mangan District of the state of Sikkim with a 60m high concrete faced rockfill dam at the Chungthang village and the power house site at Singhik village. The project utilizes the fall of the head in the river course, of about 800 meters between these two villages.
Rockfall is a major problem at the dam site, especially in the vicinity of spillway tunnels and chute spillways. The surface morphology shows that the moderately fractured weathered rock with vegetation over the slope. The exposed slope is formed with weathered rock strata that were subjected to rainfall during the monsoon seasons. The rainfall infiltrations when accompanied by the erosion factors and the steepness, trigger the rock detachment. During past rockfall events, the dam infrastructures were damaged by the shooting stones. Hence, suitable rockfall protection measures shall be proposed to address the problem.

**Solution**

As per the site observations and previous history of rockfall events, the critical location above the Chute Spillway(CS) Dam top has been identified based on the trajectory analyses and proximity to the structures for maintenance. Rocfall software (of RocScience) is used for the simulation of probable trajectories and in the analysis and design of dynamic rockfall barrier of nominal capacity 5000kJ height 7m of 100m stretch length above the CS dam top, has been proposed to mitigate the risk of rock detachments from upslope locations from affecting the tunnel and associated amenities.
The dynamic rockfall barriers installed are EAD certified and comprise of a primary interception mesh of MacRing (Ring Net) and a secondary interception mesh of DT Mesh. These rockfall barriers have a braking system, which maintains performance throughout the entire design life of the structure and are easy to visually inspect by maintenance engineers as it progressively deforms once the barriers are impacted.

**Client:** TEESTA URJA LIMITED
**Designer / Consultant:** Maccaferri Environmental Solutions Pvt. Ltd.
**Contractor:** Maccaferri Environmental Solutions Pvt. Ltd.
**Products used (Qty.)**
- Dynamic Barriers RMC 500/A 100 RM

**Date of construction:** 10/2021 - 12/2021

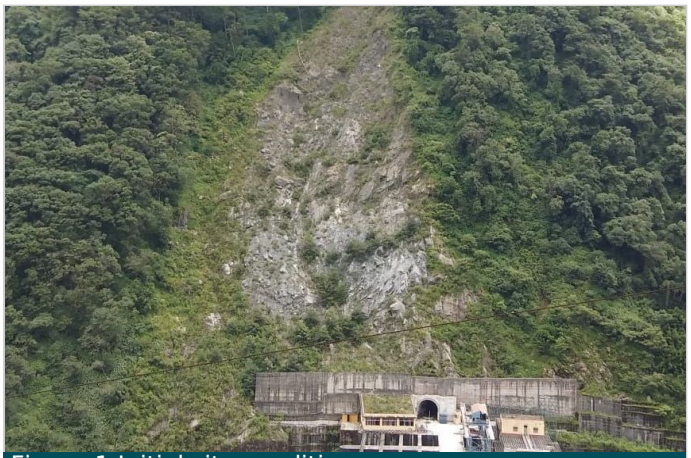


Figure-1 Initial site condition

Figure-2 Shifting activities

Figure-3 Installation of posts of rockfall barrier

Figure-4 Installation of interception meshes

Figure-5 Installed Rockfall barrier

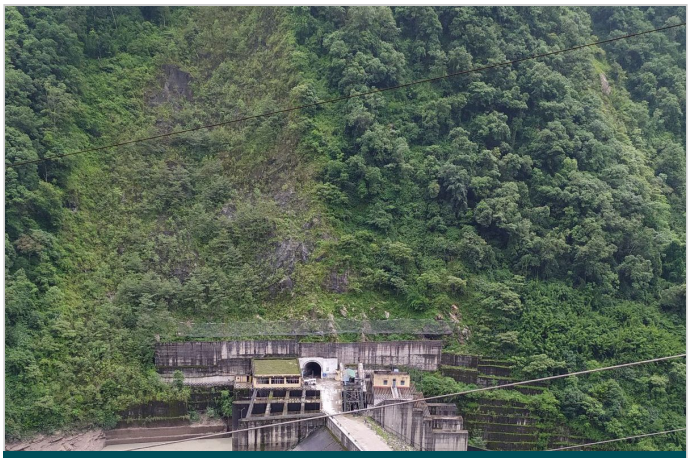
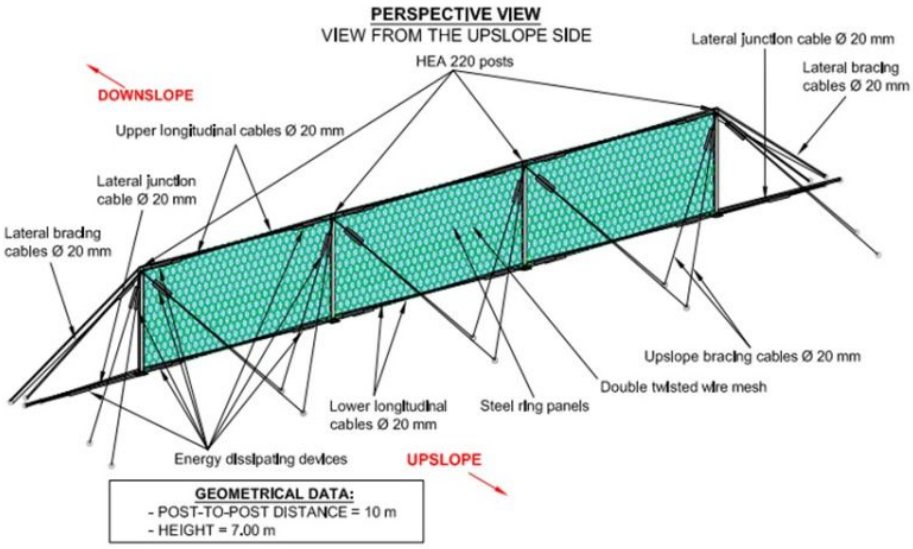
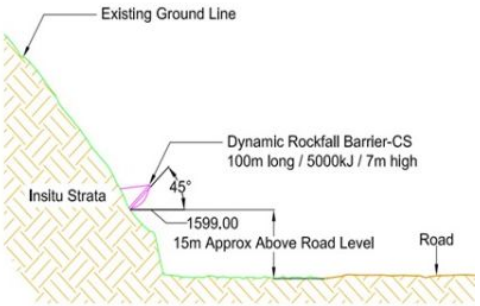


Figure-6 Overall site view after the installation of Rockfall barrier




## Scheme

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