

# ROCKFALL MITIGATION MEASURES AT PATALGANGA VALLEY, UTTARAKHAND GARHWAL, UTTARAKHAND, INDIA

## Dynamic Barriers

### Problem

Patalganga valley is located in Northwestern Himalayan region of Garhwal, Uttarakhand. After the disastrous flash floods which took place in Uttarakhand in June 2013, the national highway, NH 58 has faced significant devastation. The Ministry of Road Transport and Highways (MoRTH) has decided to rehabilitate and upgrade the entire NH 58 and suitably treat the landslides which affect the functioning of NH 58. This project has been later taken up by NHIDCL. The fragile landscape and geological hazards, especially landslides are very common in this location during every monsoon. Tectonic movements have resulted in intense shearing, faulting, thrusting and fracturing of the rocks observed. Due to presence of highly fractured rock mass, these make the area very sensitive to rockfall and slope failure that is facilitated by particularly high rainfall incidences during monsoon season. Various anthropogenic activities for infrastructure development further enhance the susceptibility of the area to slope failure.

### Solution

As per the site observations and previous history of rockfall incidents in this area, 4 critical locations are identified as the critical locations based on the trajectory analyses and proximity to the structures for maintenance. Rockfall barriers of nominal capacity 3000kJ (RMC 300/A Plus) and 5 m height have been proposed for 50 m stretch length each at the height of 30 to 60 m (varies) above bottom road to mitigate the risk of rock detachments from upslope locations from affecting the structures at the toe.

**Client:** NHIDCL

**Designer / Consultant:** -

**Contractor:** BHARAT CONSTRUCTION

**Products used (Qty.)**

- Dynamic barrier RMC 300/A	200m (5 no.sx50m each)
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**Date of construction:** 11/2019 - 02/2020



Figure-1. Location of Patalganga landslide in google earth



Figure-2. Patalganga landslide





Figure-3. Installation of Rockfall barrier



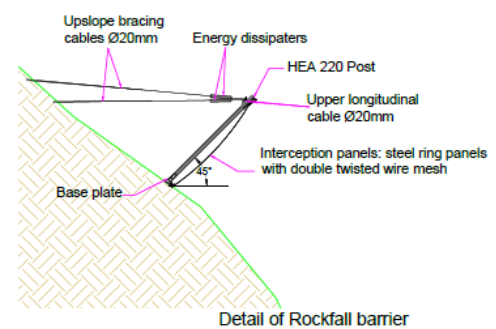
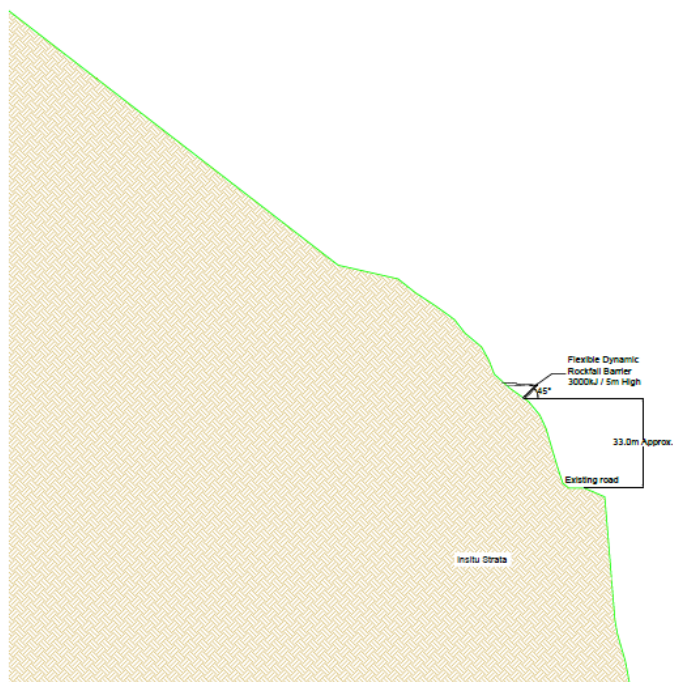
Figure-4. Erection of Rockfall barrier



Figure-5. View of installed Rockfall barrier



Figure-6. View of installed Rockfall barrier



## Cross-section

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