

MUMBAI PUNE EXPRESSWAY - ROCKFALL MITIGATION WORKS AT GHAT SECTION MAHARASHTRA, MUMBAI - PUNE EXPRESSWAY, INDIA

Dynamic Barriers

Problem

Mumbai-Pune expressway is India's first six-lane concrete expressway in Maharashtra connecting the financial capital of India (Mumbai) with state cultural capital (Pune). Built along the Sahyadri mountain ranges, through passes and tunnels, it is recognised as one of the most dangerous expressways prone to a series of rockfall and landslides, especially near tunnel portals causing a heavy damage to infrastructure, traffic disruptions and casualties specially during monsoon season.

Challenges faced:

1. Has to be done as emergency protection work.
2. Fast execution was required because of the heavy traffic road.
3. Bigger threats of rockfall during installation.

Solution

After conducting detailed engineering investigation and taking geological and geotechnical observations of the experts into consideration, Maccaferri offered a customized combination of various rockfall mitigation measures, for the identified critical stretches of the expressway.

Loose scaling was done for the removal of unstable rock mass over the slope. Secured drapery system was proposed to hold the unstable mass which were on threshold of falling from the surfaces wherever the depth of instability was less than 2m. For instability more than 2m where deep seated rock failures are predicted, long nails were installed. Dynamic rockfall barriers were installed for trapping the falling rock blocks on to the expressway.

In order to retain the in-situ stratum of the hillock portion of the final slope, soil nailing with gabion facia was also suggested. Perforated PVC drainage pipes wrapped with non woven geotextile were installed in multiple rows to dissipate the pore pressure inside the rock mass.

Client: Mumbai State Road Development Corporation

Designer / Consultant: Maccaferri/ Stup Consultants Pvt Ltd

Contractor: Maccaferri Environmental Solutions Pvt Ltd

Products used (Qty.)

- HEA Panels	21,850 sqm
- Steelgrid	44,425 sqm with diagonal ropes
- Dynamic Barriers	Barrier (250kj)- 200 RM
- Dynamic barrier RB 1500	Barrier (1500kj)- 610 RM
- Anchor Bar	21,442.5 RM (32 & 25 mm dia)
- Gabion	1214.5 cum

Date of construction: 09/2015 - 11/2016



Photo 1: Aftermath of the rockfall near Adoshi tunnel



Photo 2: Rock slide near Khandala tunnel (Mumbai corridor)



Photo 3: Rockfall mitigation and slope stabilisation measures



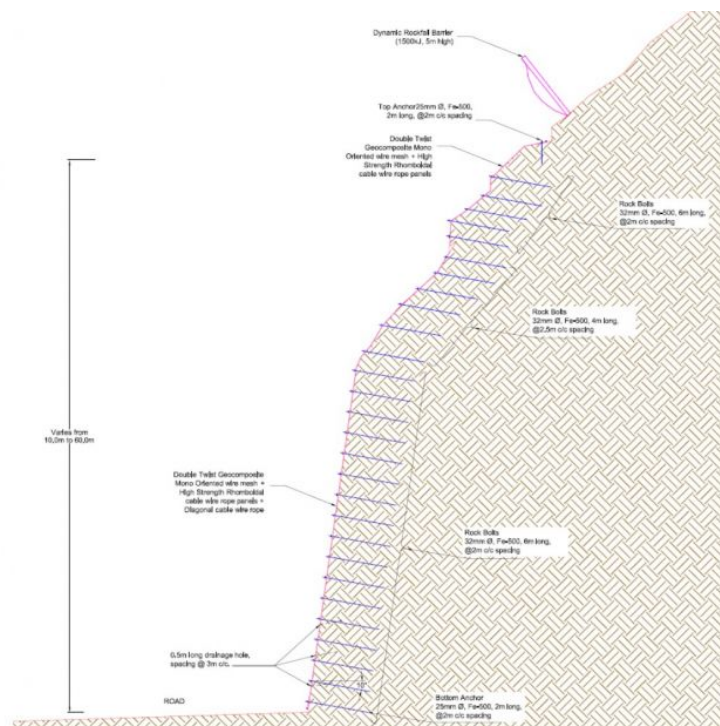
Photo 4: Rockfall mitigation measures near Adoshi tunnel



Photo 5: Rockfall mitigation measures at Adoshi tunnel- Dynamic Rockfall Barrier



Photo 6: Cleaning off the debris from upslope side of the rockfall barrier



Cross-sectional drawing for a particular stretch near Adoshi tunnel