

ROCKFALL MITIGATION MEASURES FOR PEACOCK PROJECT, RABALE RABALE, MAHARASHTRA, INDIA

Surface Strengthening and Support

Problem

Rabale is located between the residential suburbs of Airoli and Ghansoli on the Thane-Belapur road in Navi Mumbai. A walkway has been constructed near Amazon building by cutting the slope of height varying from 13m to 25.7m with 75-80 deg slope angle and approx.110m stretch length. The slope surface is exposed and the profile reveals two distinctive lithologies namely silty sand upto 3.5 m depth from top slope and then excavated basaltic rock mass.

Problem of rockfall is observed from top portion of the cut slope which is dangerous and can pose harm to the people using the passage. On top right corner of the site, where weak weathered rock is observed, problem of surficial instability of approx. 0.8m thickness has been also observed.

Solution

After studying the geological and topographical details, suitable rockfall mitigation solutions were devised to contain rocks falling from the face. To protect the area from falling rock debris, simple drapery system is proposed along with top nails and bottom nails (HYSD bars 25 mm dia., 3-4m long spaced at 1.5m c/c) and anchor fasteners on rock slope to contain loose and falling debris. Secured drapery system with mesh, wire ropes in diagonal fashion and raster of surface nails (HYSD bars 25 mm dia., 4 m long at 2.5m c/c spacing in both directions) is considered where surficial instabilities are observed. A fence of 3.5m has been constructed at toe and hence the bottom anchoring was terminated above the fence top line. Because of the proximity of the walkway to cut slope, the meshes selected need to adhere to the slope surface and should have high strength at low strain. Maccaferri Steelgrid MO was selected as the mesh for the simple and secured drapery systems to satisfy this requirement. Steelgrid MO offers cost effectiveness, ease of installation and a proven track record as well. The MacRO1 and MacRO 2 were used to design the secured and simple drapery system respectively. Subsurface drainage system has been implemented by using 4m long perforated PVC pipe (lined with non-woven Geotextile) of 50 mm internal dia. spaced at 3m c/c spacing in longitudinal direction (in 3-5 rows).

Client: Rajshree Build Tech Pvt. Ltd. (End Client-Amazon)

Designer / Consultant: Maccaferri Environmental Solutions Pvt. Ltd.

Contractor: Rajshree Build Tech Pvt. Ltd.

Products used (Qty.)

- Steelgrid	MO - 2987 Sq.m
- Anchor Bar	HYSD Bars (Fe-500) - 823 Rm
- Drain Pipes	964 Rm
- Wire Rope	Diagonal - 509 Rm

Date of construction: 04/2021 - 05/2021



Figure 1 Site condition(Aug 2019)



Figure 2 Site condition (Oct 2020)



Figure 2 Execution of rockfall mitigation measures

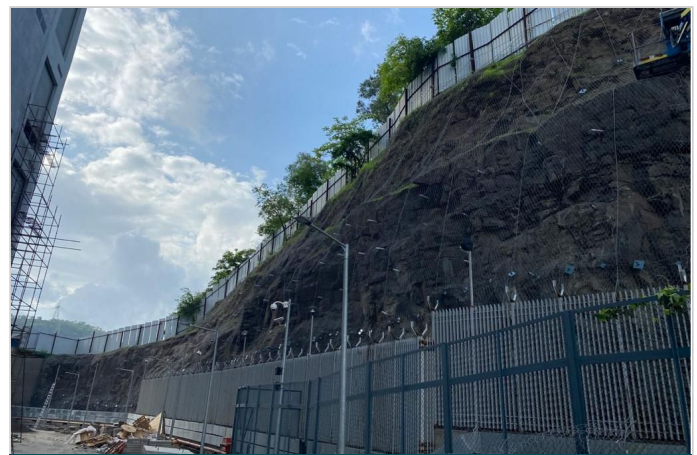


Figure 4 Execution of rockfall mitigation measures



Figure 5 Execution of rockfall mitigation measures

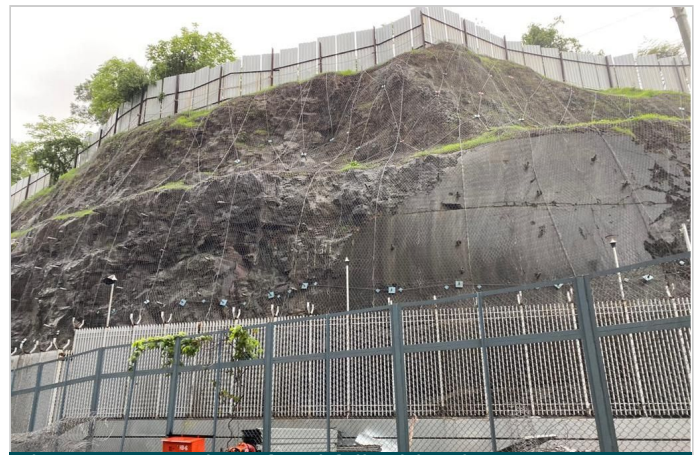
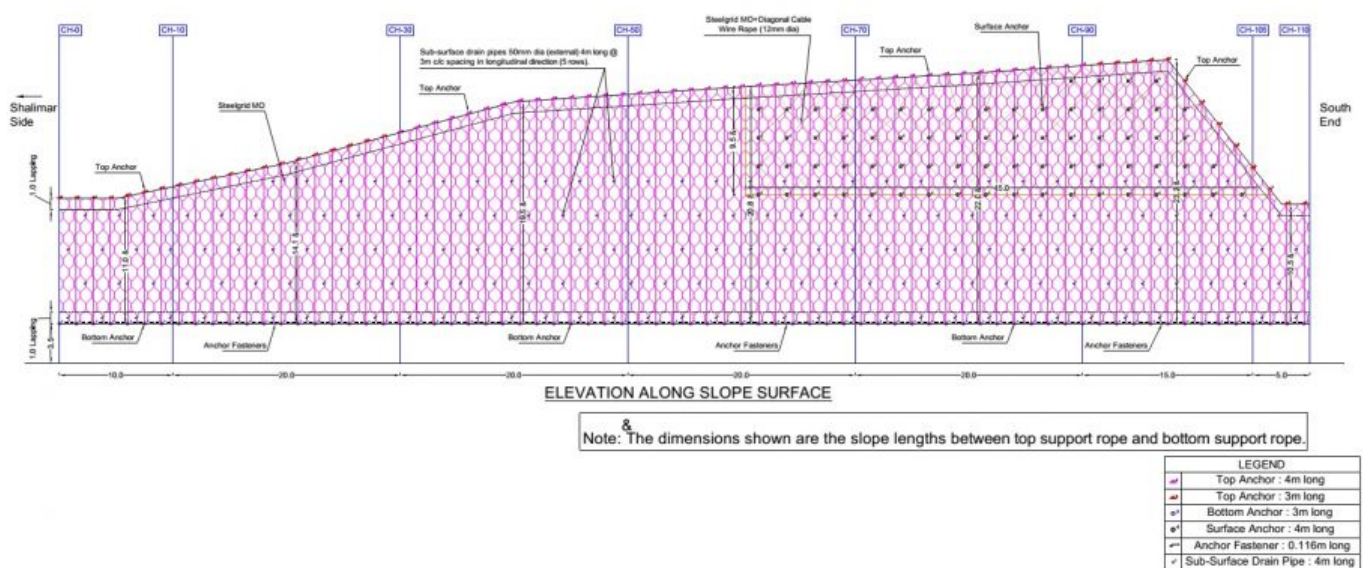


Figure 6 Execution of rockfall mitigation measures



Elevation

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