Rockfall mitigation and slope protection measures at Amba ghat, Maharashtra

Maharashtra, India



Dynamic Rockfall Barrier and Secured Drapery system

TYPE OF PROJECT	YEAR OF CONSTRUCTION	CLIENT	CONTRACTOR	DESIGNER
Slope Protection	**2025**	**National Highways Authority Of India**	**M. D. Infra India Pvt. Ltd.**	**Innovision Consultech Enterprises LLP**

PROD. RELATED

MacArmour & SteelGrid (MacArmour 30x30 - 18,200 Sqm), MacMat HS (Macmat HS 30- 2,940 Sqm), Rockfall Barriers (1500kJ- 500Rm), Gabions (1,260 Cum.)

Challenge

Rockfall events are frequently observed from the slopes along Kolhapur- Ratnagiri section of NH 166 (Maharashtra) from chainage km. 67+000 to 72+000. In addition to it, erosion and the surficial instability of the soil boulder mix slope during the monsoon season is the main problem identified. In such stretches slope failures have been observed because of soil erosion by erosive agents such as wind, water etc. Unchecked erosion has resulted in cuts, rills or gullies and slide problems. This has become a matter of serious concern which eventually leads to slides / rockfall that are dangerous to passengers, vehicles and associated infrastructure nearby. Hence, it is pertinent to address the impending rockfall / slides problem to minimize the risk.



Rockfall Mitigation using MacArmour (After installation)



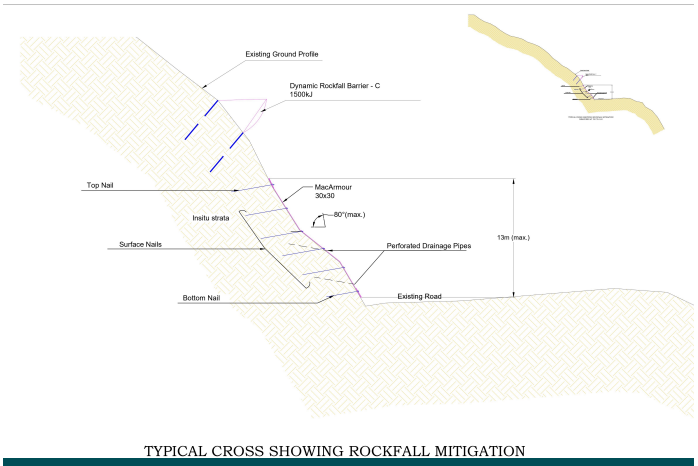
Dynamic Rockfall barrier (After Installation)

Solution

As per the site observations and previous history of rockfall events in this area, various rockfall mitigation/slope protection measures are proposed in the form of secured drapery/slope protection system, dynamic rockfall barriers, gabion toe wall and in identified locations. The secured drapery/slope protection system was proposed to hold the unstable mass which was on the threshold of falling from the surfaces wherever surficial instability is encountered. The loose scaling has been done followed by installation of secured drapery system with high resistance geocomposite steel wire mesh (MacArmour 30x30) and nails (continuously threaded anchors (CTA) and self-drilling anchors (SDA)). The nails contribute to provide surficial stability and the mesh contains the debris or rock blocks that might move between the nails in secured drapery system. The drapery systems are considered passive, because both mesh and anchors start to develop their resistance when the rock blocks start to move. The barriers. To intercept the rock detachments from the hilltop, dynamic rockfall barrier of 1500KJ capacity are installed. The dynamic rockfall barriers installed are EAD certified and comprise of primary interception mesh of ring net panel and secondary interception mesh of DT Mesh. The meshes and nails used in the secured drapery system, gabion units and Dynamic rockfall barrier are conforming to existing Indian and international codal guidelines. The system is successfully installed and is functioning as intended.



Installation of Erosion control mesh - MacMat HS 30



Typical section showing rockfall mitigation measures using



Rockfall Mitigation measures using MacArmour and nails

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