

ROCKFALL MITIGATION MEASURES ALONG KONKAN RAILWAY ROUTE,INDIA
KONKAN AREA, MAHARASHTRA, INDIA

Simple Drapery

Problem

Konkan Railway Project can be considered as one of the most prestigious projects in the construction Industry of India. The project was launched in 1989 and the track became operational in the year 1998. The 760 km line passes through complex terrains. In many of the stretches, the available space was restricted, and the side slopes were very steep. This formidable terrain and the short construction period necessitated the use of several technological innovations. The construction and widening of the track called for large quantities of cutting in rocks of lateritic and basaltic origin. The exposed lateritic terrains were subjected to heavy rainfall and in the presence of water, the laterite loses all its cohesiveness, strength and become very vulnerable to cause heavy slides and slips. This problem necessitated the provision of several landslide mitigation techniques like construction of proper retaining walls and rockfall mitigation measures.

Solution

Based upon the problem, different solutions were proposed in this project.

To mitigate rockfall from the hill side slopes, mechanically woven hexagonal double twisted PVC Coated Maccaferri rockfall netting of mesh type 10x12 was installed on the slope. Netting was then anchored into the anchor trench at crest using suitable anchoring arrangement. Commonly used as 'simple drapery', DT mesh provides a protective curtain on the slope; any rocks and debris detaching from the slope are contained behind the mesh. Unlike Single Twist (chain-link) style mesh, the construction of Double Twist ('DT') mesh inhibits the propagation of tears in the mesh. Research shows that damage to a DT mesh remains local and the mesh does not unravel, due to the DT 'locked yet flexible' connection between adjacent wires. High tensile strength, punching resistance and low installation cost of DT mesh, helped in the adoption of this system. Other retention and slope protection measures are additionally taken up.

Client: KONKAN RAILWAY CORPORATION LIMITED(KRCL)

Designer / Consultant: ENGINEERING DIVISION OF KRCL and IIT, MUMBAI

Contractor: MULTIPLE CONTRACTORS

Products used (Qty.)

- DT Mesh 10000 Sq.m

Date of construction: 02/2000 - 03/2005

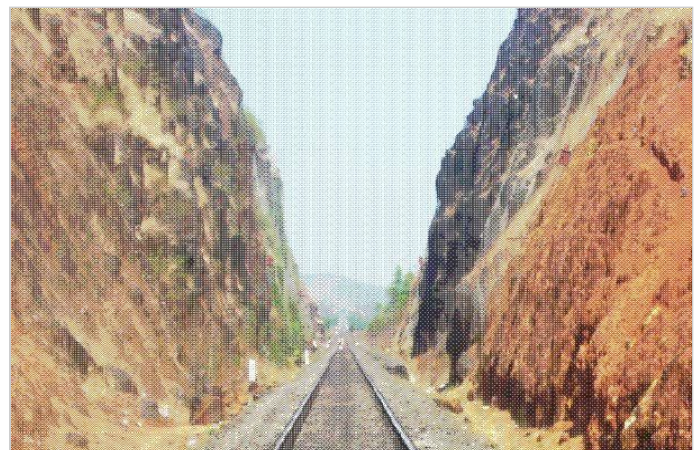


Figure-1 A typical KRCL stretch with narrow tracks & steep side slopes

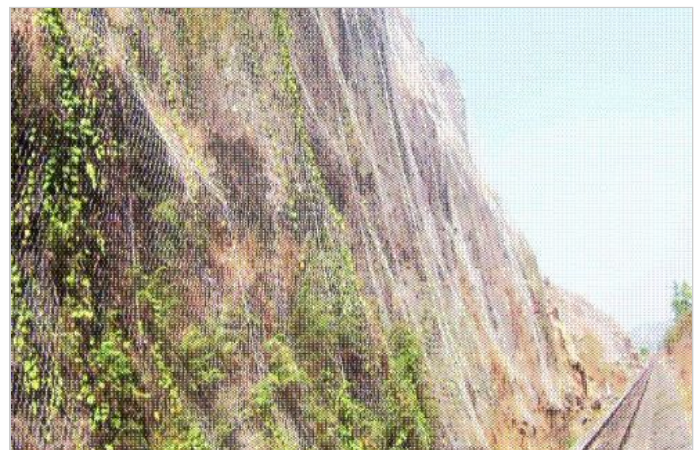


Figure-2 Simple drapery system using Maccaferri's DT mesh

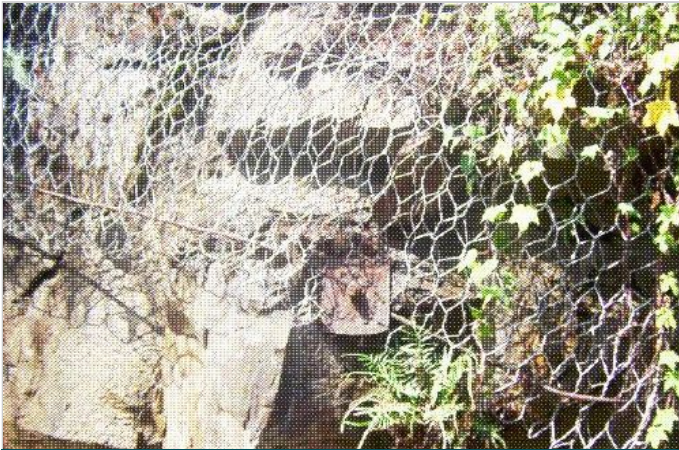
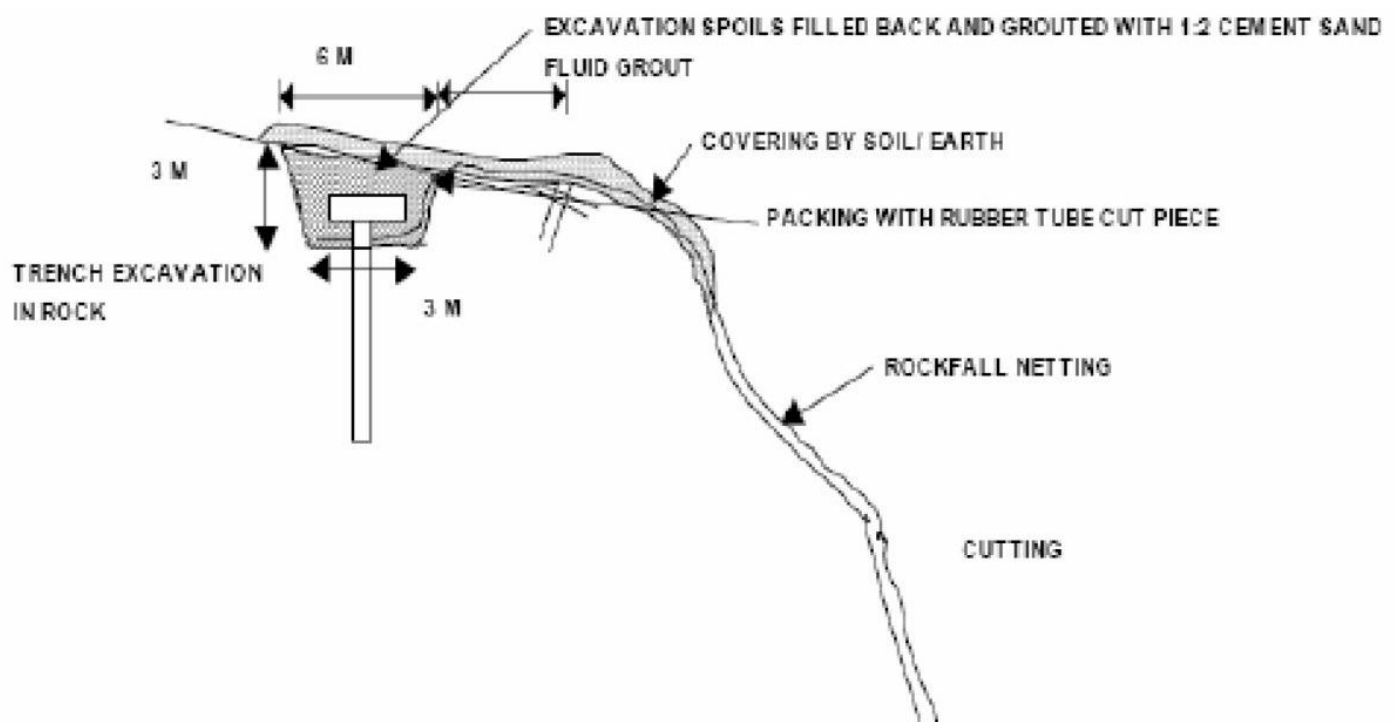


Figure-3 Bottom anchoring of DT mesh



Slope condition after few months (vegetation grown through mesh are visible)



Typical cross-section showing simple drapery DT Mesh over rocky slope