

ROCKFALL MITIGATION ALONG RAILWAY LINE CUT SLOPES- DUDHNOI DUDHNOI, ASSAM, INDIA

Surface Strengthening and Support

Problem

The NFR, is one of the 17 railway zones in India. It is responsible for rail operations in the entire northeast of the country and parts of West Bengal and Bihar. The area of the NFR operations is characterized by exceptional beauty and at the same time by some of the most arduous terrain which makes any expansion of the network complex and expensive, and the only state in the area with an extensive rail network is Assam.

With a view to improve the passenger amenities, NFR decided to construct a new railway line from Dudhnoi to Mendipathar to connect the Garo Hills in Meghalaya with Assam and the rest of the country. This new line passes through very complex terrain and the new railway track is laid in cutting at a number of locations. The side slopes of the cuttings were almost vertical to minimize excavation and there was a residual risk of rockfalls onto the track.

A rockfall protection solution was required to minimize the risk of rockfalls disrupting the train operations. Compounding the solution was the limited availability of space between the wall of the cutting and the train envelope.

Solution

Traditional rockfall mitigation solution is using drapery meshes function by controlling the falling rocks behind a containment curtain of drapery mesh. Periodically, the collected rock debris are emptied during maintenance. However, in this instance there was insufficient space between the cutting and the railway to collect rock debris. Therefore a much stiffer mesh system was required. The mesh needed not only high tensile strength, but most importantly stiffness, i.e. It would exhibit minimal deflection under load.

Accordingly, Maccaferri proposed High Energy Absorption Panels (HEA Panels) and Steelgrid MO meshes depending on the geology encountered. These were secured to the rock slope with top, bottom and intermediate anchors on the face. The surface anchors were of self drilling anchors(SDA)-32mm dia and 3m long.

Client: Northeast Frontier Railway (NFR)

Designer / Consultant: -

Contractor: Maccaferri Environmental Solutions Pvt Ltd.

Products used (Qty.)

- HEA Panels	10,288 sqm
- Steelgrid	MO - 10,245 sqm
- Anchor Bar	(SDA)-32mm dia-4,506 RM

Date of construction: 02/2015 - 10/2015

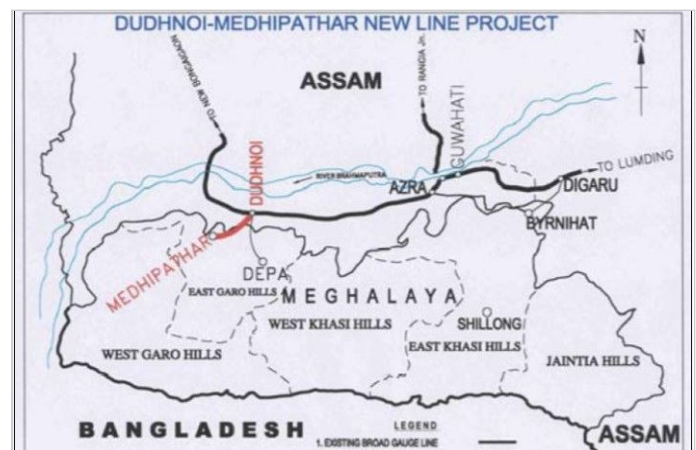


Photo 1: Location map



Photo 2: Site condition before construction



Photo 3: Execution in progress



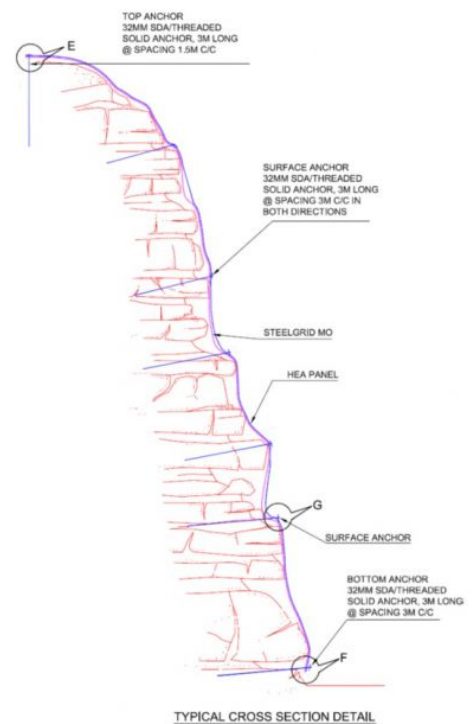
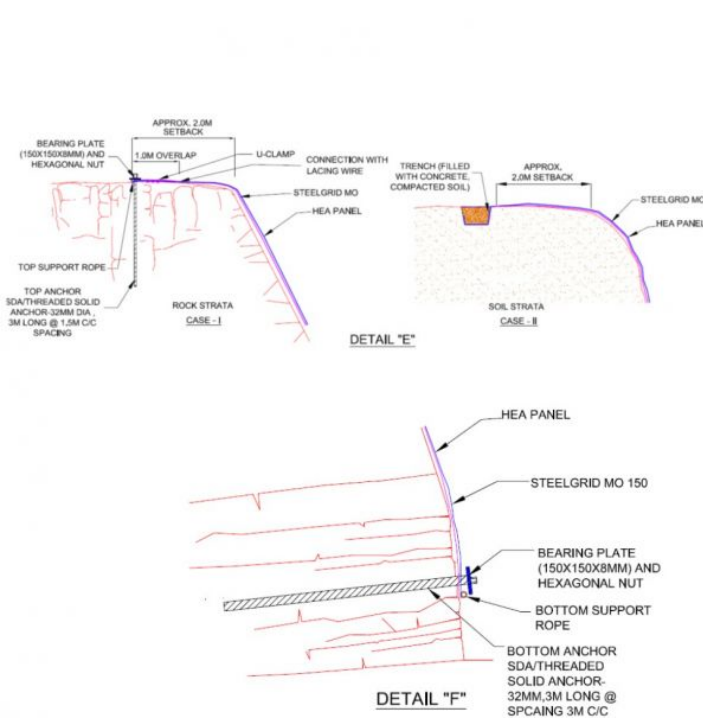
Photo 4: Mesh installation



Photo 5: Completed protection work



Photo 6: Completed rockfall protection work



Cross sectional drawing

MACCAFERRI ENVIRONMENTAL SOLUTIONS PVT. LTD
D40, MIDC Ranjangaon, Tal-Shirur, Dist. Pune - 412 220
Tel: +91 2138 393000 , Email: info.in@maccaferri.com