

CUT-SLOPE STABILISATION USING SOIL NAILING AT VILLUKURI VILLUKURI, TAMIL NADU, INDIA

Soil Nailing

Problem

National Highway-66 is a busy corridor that runs roughly North-South along the western coast of India, parallel to the Western Ghats. It connects Panvel to Kanyakumari, passing through the states of Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu. National Highways Authority of India (NHAI) decided to have a new 4-Lane Connectivity between Trivandrum in Kerala and Kanyakumari in Tamil Nadu. M/s. Larsen & Toubro Construction Limited had undertaken the above work which includes three major packages. The Tamil Nadu - Kerala border to Villukuri Road Project (TVRP) package comprises of several cut and fills in order to achieve a uniform gradient. The highway alignment is planned in such a way that it passes through cut sections for the height ranging between 2 m and 18 m. Since the stretch is having limited ROW, large depth cut sections need to be provided with steep cutting angles. Hence suitable solution need to be adopted to address the stability and surface protection of the cut sections.

Solution

As per geotechnical investigations carried out between KM 43/000 to KM 70/250, rocky strata is overlain by lateritic soil, clayey soil, river and coastal alluvium as well as black and red sandy soils. The global stability of the critical cross sections were analyzed and it was observed that stabilization measures need to be adopted. The probable failure surfaces were observed to be surficial as well as deep seated. As the strata is majorly comprising of lateritic soil which is highly challenging, erosion control measures were also to be adopted apart from stabilization measures. Considering the above challenges, the soil nailing with mesh flexible facia system in combination with erosion control measures was proposed.

The soil nails are installed in stages following top-down sequence. The nails address the global stability of the cut slope and the facia comprising of MacMat HS along with Hydraulically applied erosion control measures (HECPs) induces surficial strengthening, reduces erosion and promotes the growth of vegetation on the exposed cut portions for long term protection.

The implementation was carried out phase wise at different locations as per requirement.

Client: NATIONAL HIGHWAY AUTHORITY OF INDIA

Designer / Consultant: MACCAFERRI ENVIRONMENTAL SOLUTIONS PVT. LTD.

Contractor: LARSEN & TOUBRO CONSTRUCTION

Products used (Qty.)

- MacMat HS 22000 sq.m

Date of construction: 10/2017 - 12/2020



Initial site condition



Excavated cut slope



Installed Nails on slope surface



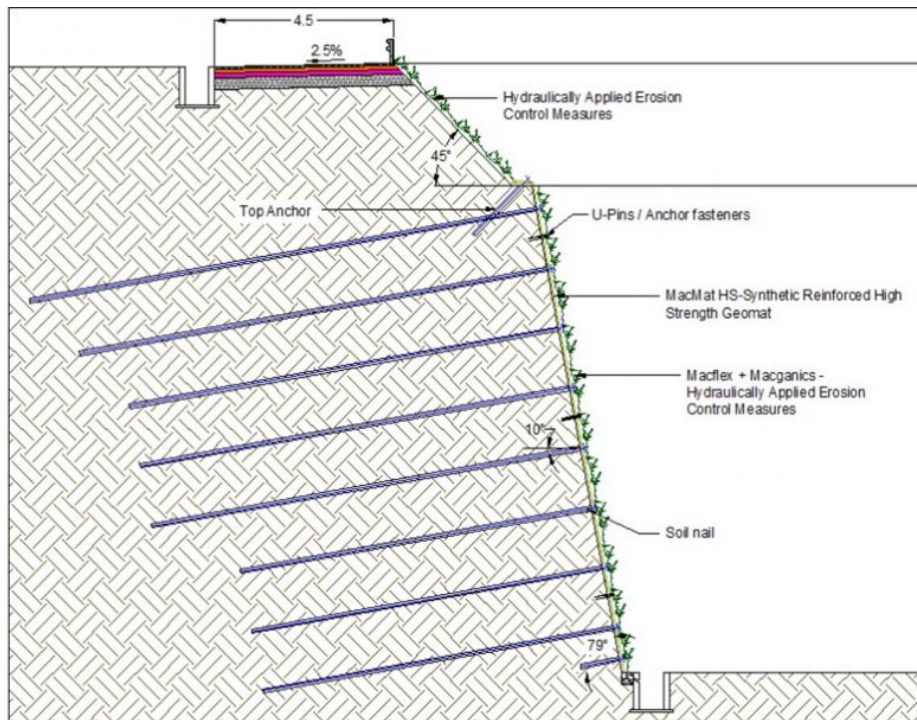
Hydroseeding application



vegetated cut-slope face



Ongoing Execution



Cross-section