

EROSION CONTROL MEASURES - VALLEY SIDE - HELANG, UTTARAKHAND

ALONG NH-58, CHAMOLI DISTRICT, UTTARAKHAND, INDIA

Slope Protection

Problem

Helang site is located along NH 58 in Joshimath Tehsil in Chamoli District of Uttarakhand State, India. The surface morphology shows that the moderately fractured weathered rock with vegetation over the slope. The Main Central Thrust (MCT) also passes from this area hence forming the area vulnerable and unstable. The site falls under a highly active seismic zone i.e. zone V and heavy rainfall is usually expected during monsoons. The exposed slope is formed with weathered rock strata that were subjected to rainfall during the monsoon seasons. These rainfall when accompanied by the erosion factors and the steepness, trigger the rock detachment which affects the movement of traffic along this route. The site has been witnessing various slope instability, rockfall and erosion problems and there was a requirement of road widening as well.

Solution

Reinforced soil structure (Maccaferri's Paramesh system) has been constructed as the road side retention measures. In order to provide the toe side erosion control on the valley side slope below the reinforced soil structure base, combination of erosion control solutions have been adopted after judicious assessment of the slope angle and extent of erosion. To address erosion control, a combination of biodegradable erosion control (Jute mat -BioMac JU), Double Twist (DT) Mesh and hydraulically applied erosion control measures be applied. Hydraulically applied erosion control measures (with MacFlex HP FGM), MacGanics BSM (top soil alternative), agronomic amendments, water and seeds) are applied over erosion control mat and DT mesh. This system uses a high performance flexible growth medium to enhance vegetation that offers a better protection on slopes. The usage of biotic soil medium, selection of grass seeds and have been done based on agronomic tests carried out on soil. Additional measures such as rockfall mitigation, road side retention, bank side slope protection works etc are adopted separately.

Client: National Highways & Infrastructure Development Corporation Ltd. (NHIDCL)

Designer / Consultant: MAGOT ENGINEERING CONSULTANTS PVT. LTD.

Contractor: RG BUILDWELL ENGINEERING LTD.

Products used (Qty.)

- Biomac natural	BioMac JU-2400 Sq.m
- DT Mesh	2400 Sq.m
- Other Biomaterials	MacGanics, MacFlex- 2400 Sq.m

Date of construction: 11/2016 - 01/2020



Figure-1 Initial site condition



Figure-2 Installation of erosion control mat



Figure-3 Application of HECP (MacFlex)



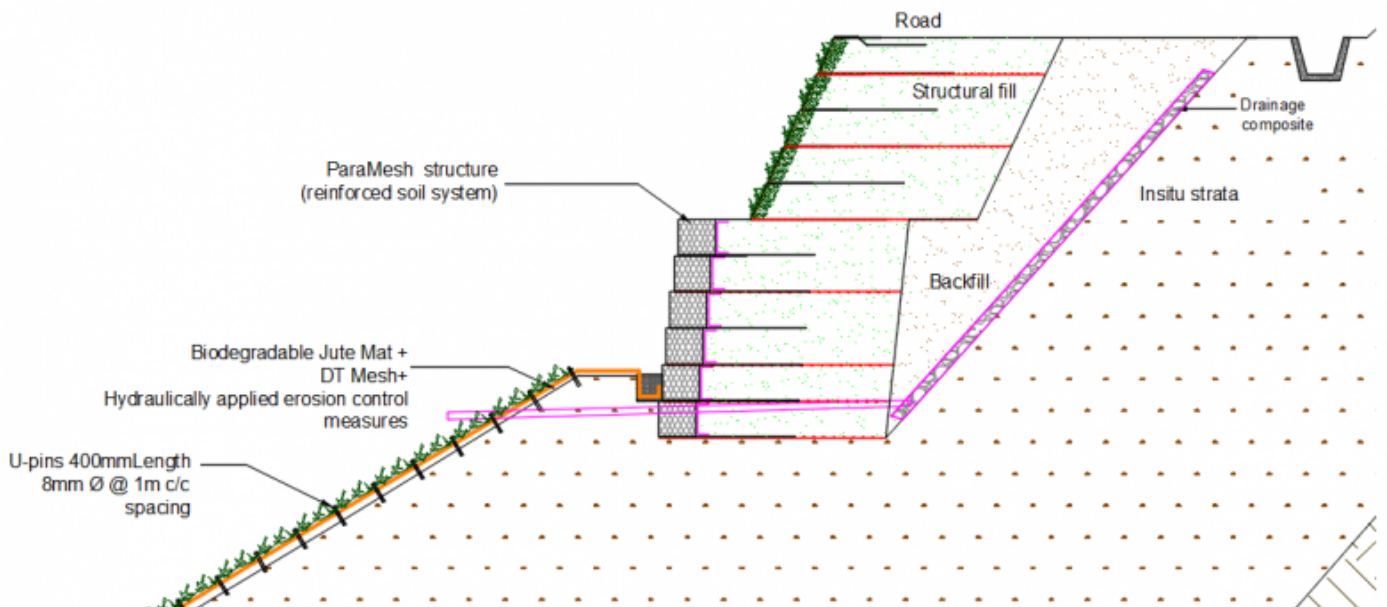
Figure-4 Start of germination



Figure-5 Vegetation establishment within some time



Figure-6 Vegetation establishment (Sept 2021)



Solution Scheme

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