

EROSION CONTROL MEASURES FOR RAILWAY EMBANKMENT AT LUCKNOW

LUCKNOW, UTTAR PRADESH, INDIA

Slope Protection

Problem

A railway embankment with maximum slope inclination 1V:2H has been constructed near Telebagh junction, near to irrigation department colony, along the of Utraitia - Alamnagar byass railway line of Lucknow division under Northern Railways. Innovative and eco-friendly erosion protection measures are required for the protection of embankment side slopes. The embankment has been made up of backfill soil containing very little biotic ingredients required for vegetative growth and hence vegetation could not grow on this soil naturally to prevent erosion.

Solution

Maccaferri has suggested the erosion control system consisting of rolled erosion control product (RECP)- MacMat R (steel reinforced synthetic geomat) and hydraulically applied erosion control product (HECP) – MacFlex HP FGM, other agronomic amendments such as AquapHix, Jumpstart, Bioprime & NPK and top soil alternative as per requirement. The complete work site consisted of 3 locations. A slope area of 300 sqm was selected under location 1 and divided into multiple bays as part of the trial initially and after the performance is verified, same solution has been adopted for all 3 locations. The installation of MacMat R and HECPs along with different combination of seeds was applied on the slope. The agronomic tests have been conducted to determine the soil nutrients condition to measure soil's ability to supply essential elements to seeds, the amendments to improve the soil and to ensure appropriate plant species selection. The seed species have been selected based on the soil type present at site, pH, climate, type of planting, availability of local seeds and discussions with a horticulturist.

The quantities of HECPs, soil amendments have been finalized before mixing in a hydroseeder along with seeds and water. The measures adopted helps to slow runoff discharge and reinforce the roots of vegetation. The client and contractor have extended full support during the project tenure in implementing the methodology without affecting the progress of work.

The germination has been observed over the embankment slope within 1-2 days. The growth of vegetation was satisfactory in 7-12 days on the treated slope.

Client: Northern Railway Construction, Lucknow

Designer / Consultant: Maccaferri Environmental Solutions Pvt Ltd

Contractor: M/s Anuj Gupta

Products used (Qty.)

- Other Biomaterials	9,000 sqm (MacFlex)
- MacMat R - Steel	1,000 sqm

Date of construction: 01/2021 - 02/2021



Photo 1: Preparation of site



Photo 2: Application of MacFlex



Photo 3: Watering after mulch application



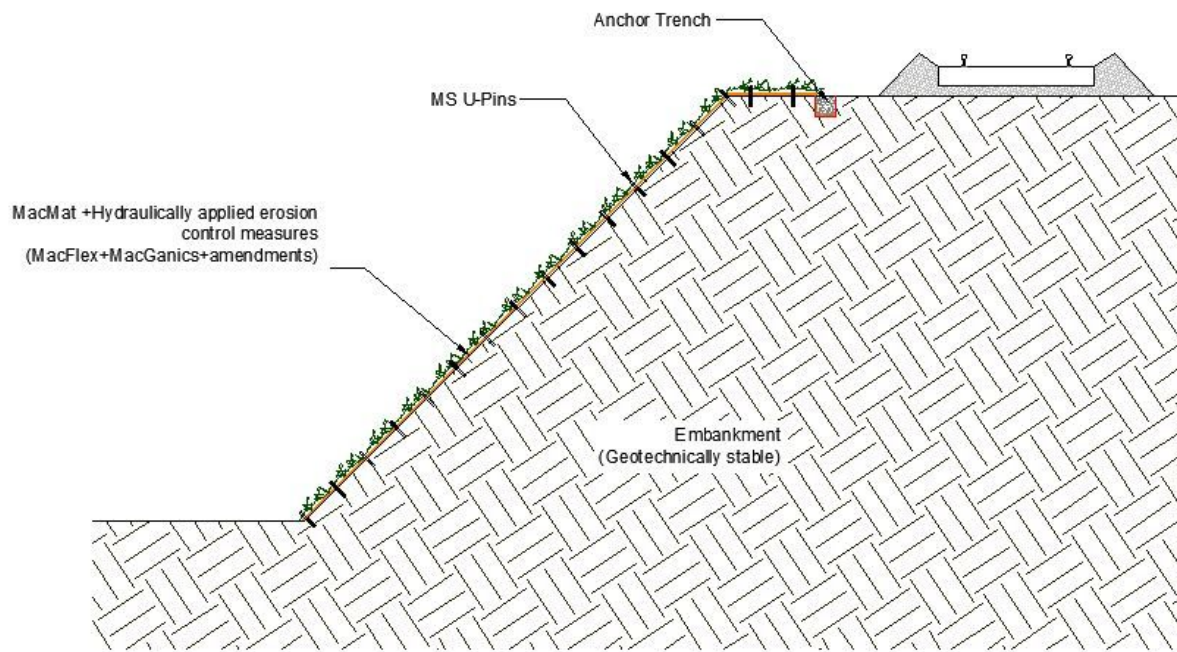
Photo 4: Laying of MacMat R



Photo 5: Vegetation growing through MacMat R



Photo 6: Vegetation observed over the soil slope



Typical 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