MACCAFERRI

CASE HISTORY

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BLANKET THICKNESS REDUCTION USING GEOSYNTHETIC SOLUTION FOR ADANI

PATLI, GURGAON, HARYANA, INDIA

Sub-grade Improvement

Problem

This project site is located at Patli, approximately 35 km away from Gurgaon, Haryana. It is Railway siding project of Adani Logistics which comes under the Northern Railway zone. Since mining is restricted in India due to environmental concerns, the blanket material for railway formation was not available in nearby area of project site and had to be procured from far places which would in turn increase the project cost.

With this constraint in view, the engineers were looking for a solution minimizing blanket (subballast) material with same performance and economical.

Solution

Geosynthetic solutions play a vital role as alternative to conventional approach in track bed stabilization projects. The design was based on modified method authored by P. Rimoldi which is extension of Leng and Gabr method. As per RDSO guideline, Extruded Polypropylene Bi-axial MacGrid EG geogrid with 30 kN/m tensile strength and 38mm X 38mm aperture size was adopted. Non woven (MacTex N 60.1) needle punched geotextile was used as separator & filter layer. Geotextile is placed at interface of blanket & subgrade layer. MacGrid EG was used for reducing the blanket layer thickness from 0.6m to 0.3m for heavy axle load railway line (i.e. 32.5 ton). MacGrid EG was placed at middle of blanket layer.

MacGrid EG stabilizes the blanket layer by ensuring lateral confinement of granular material, tension membrane effect and improved bearing capacity. MacTex N is permeable layer which allows water to pass through it and it avoids the intermixing of blanket layer & prepared subgrade. Thesolution turned out to be the viable option in saving material, labor and time along with reduction in carbon footprint.

Client: ADANI GROUP

Designer / Consultant: HOWE Engineering Projects (India) Pvt. Ltd

Contractor: Adani Group

Products used (Qty.)

- MacGrid EG 26,584 Sqm
- MacTex N 27,762 Sqm

Date of construction: 10/2018 - 02/2019

Photo-1: Site during construction

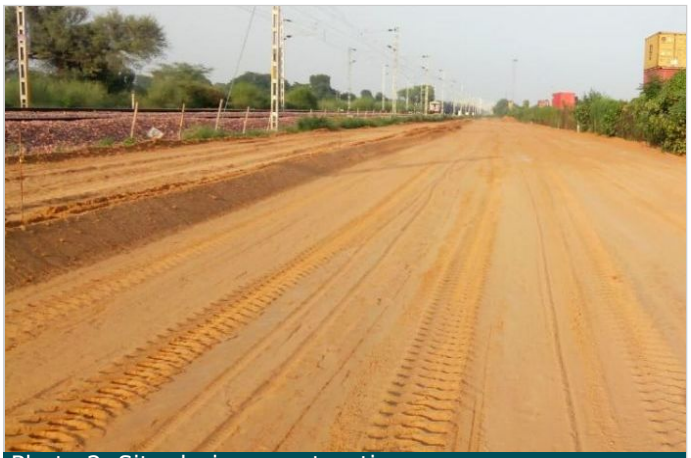

Photo 2: Site during construction

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Photo 3: Laying of MacTex Geotextile and Blanket layer

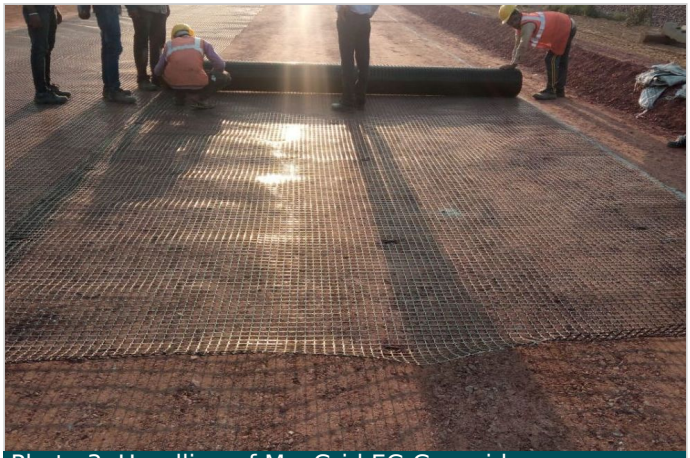
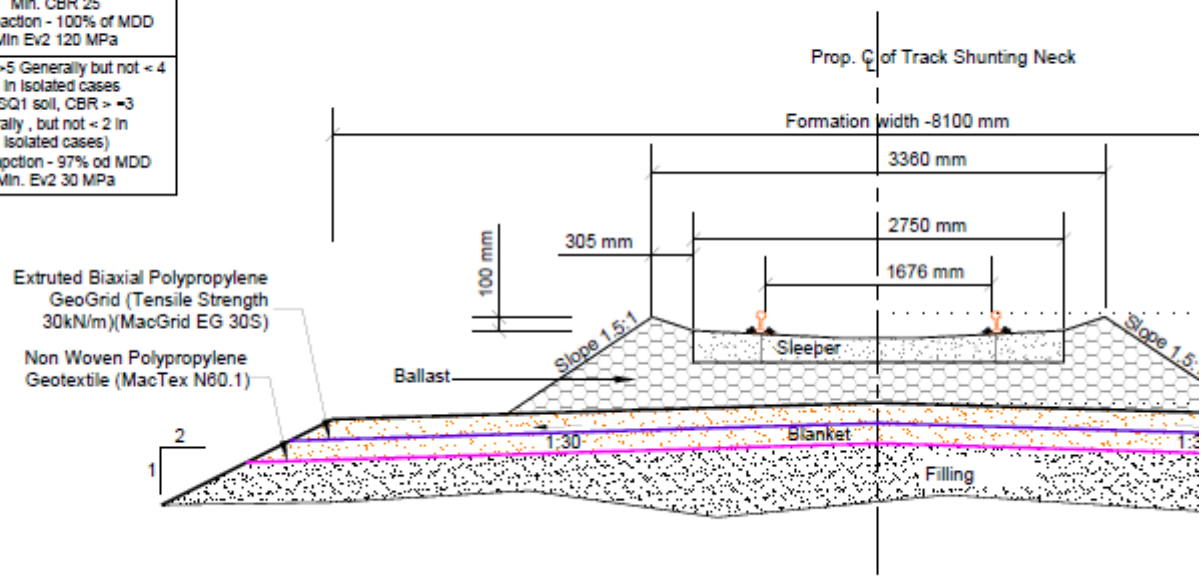


Photo 3: Unrolling of MacGrid EG Geogrid

Photo 4: Installation of MacGrid EG Geogrid

Photo 6. Laying of Blanket layer over MacGrid EG

Layer	Values
Blanket (Specification as per RDSO Guidlines.	Min. CBR 25 Compaction - 100% of MDD Min Ev2 120 MPa
Ground / Sub-soil Strata	CBR>5 Generally but not < 4 In isolated cases (For SQ1 soil, CBR > =3 generally , but not < 2 In Isolated cases) Comapction - 97% od MDD Min. Ev2 30 MPa



Typical cross section

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