

## CASE HISTORY

Rev:00, Date : 21.06.2021

### UPGRADATION OF RURAL ROADS AT SHIRPUR USING TECHGRID GEOGRID & WOVEN GEOTEXTILE, DHULE, MAHARASHTRA

(CHAINAGE - 0/000 to 2600 & 6600 to 14500)

DHULE, MAHARASHTRA, INDIA



#### Subgrade Stabilization

Client:	Products used:
NODAL EXECUTIVE ENGINEER, PMGSY MMRDA, DHULE, MAHARASHTRA	<ul style="list-style-type: none"><li>• TFI 5300 TYPE -1 (WOVEN GEOTEXTILE)</li><li>• TECHGRID GEOGRID TGB 40</li></ul>
Main Contractor:	
M/S PADMAVATI CONSTRUCTIONS, SHIRPUR, DHULE	
Manufacturer & Supplier:	Year of construction:
TECHFAB (INDIA) INDUSTRIES LTD.	MARCH 2017

#### Problem:

Shirpur is a taluka in Dhule district of Nashik Division, 50 km from the city of Dhule. The road stretches which was to be upgraded was passing through agricultural fields of cotton and banana having very low subgrade CBR of 1.67%, which was causing continuous seepage of water through the crust of road. And the road was subjected to heavy sand traffic of Hyva Trucks which were coming from Tapi River.

Due to these reasons the existing road was damaged in the form of major settlement, cracks, unevenness resulting overall damage to WBM layer. The road laid on black cotton soil (BC Soil) bases develop undulations at the road surface due to loss of strength of the subgrade through softening.

Black cotton soil contains montmorillonite mineral, because of which the soil becomes very slushy when in contact with water and gets brittle on drying. These alternate cycles of wetting and drying makes the highly unsuitable for any type of construction. Flexible pavement designed over this type of soil requires very high crust thickness, which makes it uneconomical.

Considering the existing pavement condition and heavy traffic loading it was decided by the Client to go for pavement rehabilitation solution that is durable.

#### Solution:

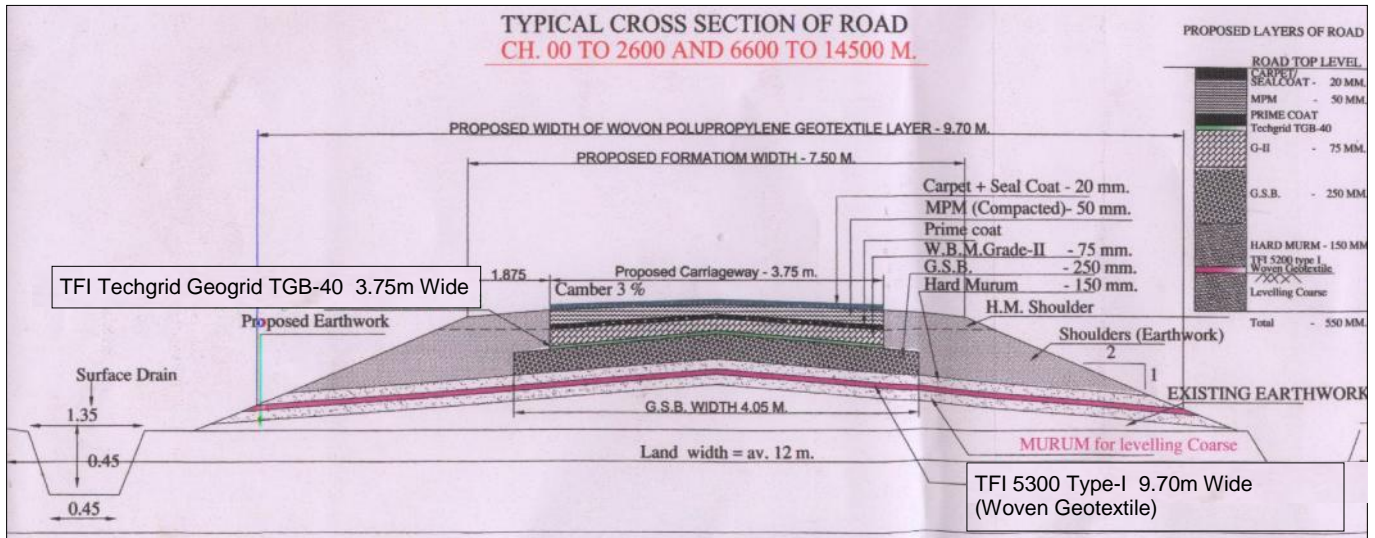
The Client referred the problem to TechFab India Industries Ltd. for the upgradation of the existing road. Ease and speed of construction was a key element in the design selection process. Considering the site condition and poor soil properties, we suggested the use of TFI - 5300 Type-I as per guidelines of IRC:SP:59-2002 for the subgrade stabilization and TechGrid Biaxial Geogrid TGB-40 (40mm x 40mm) for the reinforcement of granular materials of the existing road stretches comprising of black cotton soil, high traffic intensity & water logging.



Photo 1 & 2 : Site Condition - Before Construction

TFI - 5300 Type-I are polypropylene woven geotextiles with slit-film (tape) yarns in the warp and fibrillated tape yarns in the weft direction. These engineered geotextiles are stabilized to resist degradation due to ultraviolet exposure and are resistant to commonly encountered soil chemicals, mildew & insects, & are non-biodegradable.

TechGrid Geogrid TGB Series are manufactured from superior grades of polyester filament yarn with high tenacity, high tensile modulus, low creep and low shrinkage. Yarns with high molecular weight (> 25,000) and low carboxyl end groups (< 30) are used to ensure durability of the Geogrids used in permanent structures.



Typical Cross Section drawing



Photo 3 : Pavement Subgrade Surface is Prepared





Photo 4 & 5 : Sand Layer laid on prepared surface

### Installation of TFI - 5300 Type-I woven geotextiles / TechGrid Geogrid TGB 40

1. Once the sub grade along a particular segment of the road alignment has been prepared the geotextile or geogrid shall be placed loosely with no wrinkles or folds at compacted sub grade level, and with no void spaces between the geotextile or geogrid and the ground surface.
2. Wrinkles and folds in the geotextile or geogrid should be removed by stretching. Successive sheets of geotextile or geogrid shall be overlapped a minimum of 300 mm on longitudinal & transverse directions.
3. In case of geotextile or geogrid gets damaged during installation, a geotextile or geogrid patch shall be placed over the damaged area with minimum overlap 300 mm.
4. Placement of design crust layer material should proceed immediately after placement of geotextile or geogrid.



Photo 6 : GSB Layer over Sand Layer





**Photo 7 : Laying of woven Geotextile TFI - 5300 Type-1**



**Photo 8 : Placing of Sand over Woven Geotextile TFI - 5300 Type-1**





**Photo 9 : Laying of TechGrid Geogrid TGB-40**

Use of Knitted and PVC Coated Polyester Biaxial Geogrid TGB-40 (40mm x 40mm) has found extensive application in this road, particularly in expansive soil area of heavy vehicular load.

The grid structure is formed from the yarns using an advanced weft insertion; warp knitting technology employing state-of-the-art warping and knitting machines. This advanced technology ensures a product with uniform structure and consistent properties.

The knitted grid is then given high quality polymeric coating using a specially formulated PVC compound. The coating completely saturates and envelopes the polyester yarn bundles forming a protective cover enhancing dimensional stability of the Geogrid, resistance to installation damage and protection from the environment.



**Photo 10 : Placing of MPM over TechGrid Geogrid TGB-40**





Photo 11 : Carpet in progress



Photo 12 : Laying of Seal coat





Photo 13 : Traffic on road after construction



Photo 14 : Road After 4 Years

### **Conclusion:**

The project was successfully completed in March 2017 within the stipulated time following all the quality norms and as of June 2021, the road stretch is performing well as desired.

### **For further details kindly contact :**

#### **TechFab India Industries Ltd.**

711/712, Embassy Centre, Nariman Point, Mumbai – 400021

Tel: + 91– 22 - 2287 6224 / 6225 Fax: + 91– 22 - 2287 6218

E: [info@techfabindia.com](mailto:info@techfabindia.com)

W: [www.techfabindia.com](http://www.techfabindia.com)