

CASE HISTORY

Rev:01, Date : 16.06.2020

**IMPROVEMENT OF ROAD FROM SH TO KANDALGAON ROAD ODR - 90KM
0/000 TO 4/300, TAL - KARVEER, DIST - KOLHAPUR, MAHARASHTRA
KOLHAPUR, MAHARASHTRA, INDIA**



Pavement Stabilization & Retention Works

Client:	Products used & Quantity supplied:
PMGSY, MAHARASHTRA RURAL ROAD DEVELOPMENT ASSOCIATION (MRRDA) KOLHAPUR	TFI 5300 TYPE - I TECHBOX METAL GABION (ZN + PVC COATED) TECHGEO NONWOVEN GEOTEXTILE PR 20
Main contractor:	
TRIVENI CONSTRUCTIONS, KOLHAPUR	
Manufacturer & Supplier:	Year of construction:
TECHFAB (INDIA) INDUSTRIES LTD.	DECEMBER 2013

Problem:

Road from SH to Kandalgaon Road ODR- 90Km 0/000 to 4/300, Tal-Karveer passes through rich black cotton soil having a very low CBR value and erosion occurred due to cross-drain & pond. The road was subjected to heavy vehicular traffic intensity because of State Highway and was also surrounded by the irrigable land on both sides. With the onset of monsoon the road got heavily water logged and due to the existence of the black cotton soil and high traffic intensity certain stretches of road got heavily distressed with significant settlement, unevenness & fatigue cracks. 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.

Maharashtra Rural Road Development Association (MRRDA), thereby awarded the Improvement of Road from SH to Kandalgaon Road ODR- 90Km 0/000 to 4/300, Tal-Karveer, and Dist.Kolhapur respectively.



Original Site condition - In monsoon



Earthwork after Scarifying Distressed



Checking of Subgrade – Exe. Engineer

Solution:

TechFab (India) Industries Ltd suggested the use of TFI – 5300 Type-I for the sub grade stabilization of the existing road stretches comprising of black cotton soil, high traffic intensity & water logging.

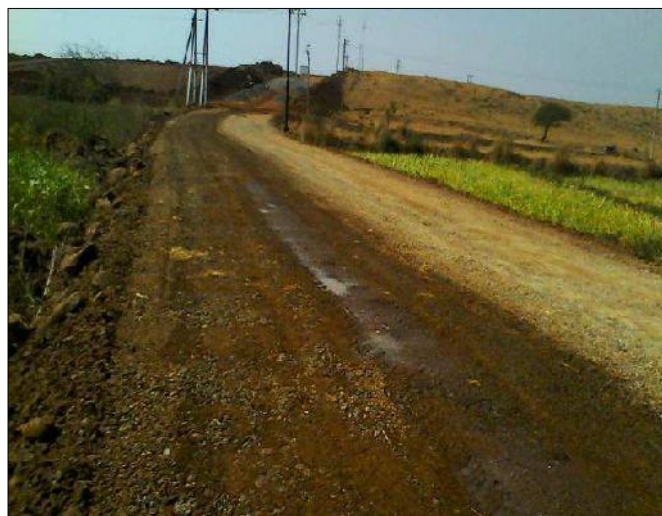
TFI – 5300 Type-I are polypropylene woven geotextiles with slit-film (tape) yarns in the warp and fibrillated tape yarns in the weft direction. These engineered geotextiles are stabilized to resist degradation due to ultraviolet exposure and are resistant to commonly encountered soil chemicals, mildew & insects, & are non-biodegradable. Road has been left for traffic after completion of WBM. There is no settlement seen from last one month.



Laying of TFI-5300 Type-I



Visit of Geotextile Expert Team



Preparation of GSB



MPM in Process



Carpet in Process



Laying of Seal-Coat



After Completion (Dec 2013)

Techfab also suggested the use of TechBox Metal Gabion as retaining structures for the protection against the water body. Gabions can take settlement which may occur in such regions. TechGeo Nonwoven Geotextile PR 20 was placed at the rear end of gabion wall which acts as filter.



Excavation for Gabion Retaining Wall



Construction of Gabion Wall



Gabion Retaining Wall

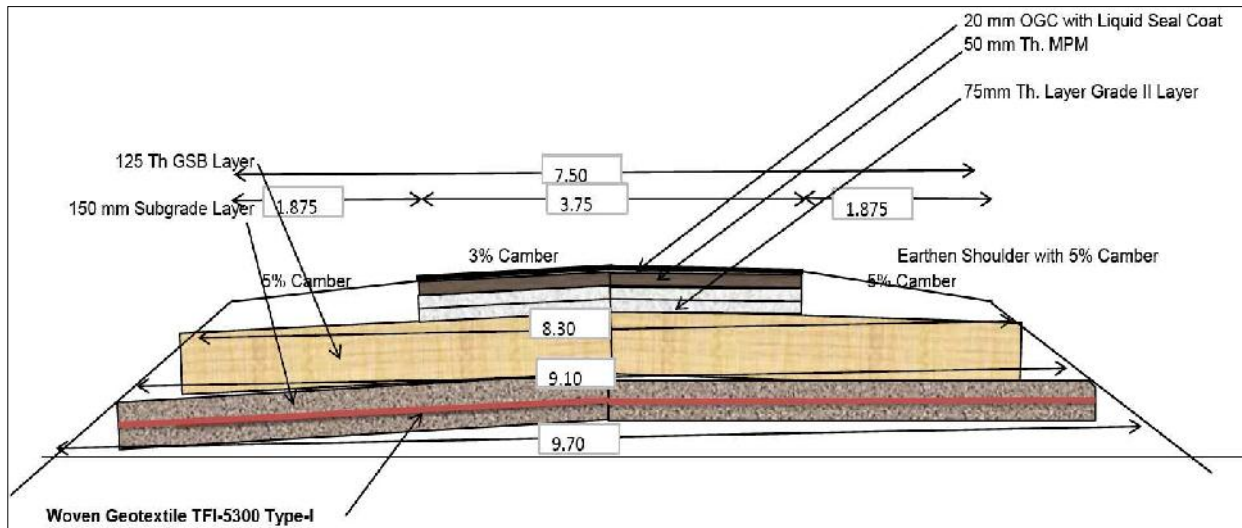


After Completion (Dec 2013)

Gabion construction is fast and can be done using unskilled labors. Boulders are available in the vicinity, reduced the overall project cost and make the project very cost effective. Excavation for minimum 1 meter depth was carried out in the virgin soil. Any unsuitable soil removed and replaced with good quality soil. Nonwoven Geotextile are used beneath and behind the Gabion wall for filtration purpose. Compacted filling was proposed and being carried out at site. Final batter as per the design was achieved after the completion of the work.

Execution:

The existing road at the said stretches was first dressed to get the required cross slope, over which 200mm of murrum layer was laid. Water Bound Macadam (WBM) consisting of 40/60 metal was laid in two layers for a total of 225mm thickness. TFI – 5300 Type-I was then laid over the prepared surface in a tight condition, so that it can develop the required tension. Burnt Bitumen Macadam (BBM) of 75mm thick and asphalt carpet 20mm thick was laid over the same.



Benefits:

- Improved lateral confinement of aggregates
- Distributes load over a larger area
- Increase in bearing capacity & shear strength of sub grade
- Reduction in sub base thickness
- Increase in life of pavement

Benefits of TechFab Metal Gabion over Conventional RCC Retaining Wall:

TechFab Metal Gabion was suggested for retaining and erosion control purposes in lieu of the conventional R.C.C Retaining Wall for achieving the following advantages:

1. Flexible structure which can accommodate differential settlement.
2. Free draining structure with no pore pressure development behind wall.
3. Easy in construction, as it does not require skilled laborers.
4. Does not require curing time as in case of R.C.C Retaining wall.
5. Eco-friendly, as the vegetation growth over it, is compatible with surrounding environment.
6. Does not corrode under areas which are in constant / partial submergence.
7. Cost incurred is very less compared to R.C.C Retaining Wall and depends only on the local availability of boulders.

Status after completion of one year:

The site has been visited jointly to check the performance of the road, as well as for Gabion retaining walls. The performance was satisfactory and photographs of the joint visits are included below:



After one year of completion



After one year of completion



Gabion Retaining Wall

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