

Reinforced Soil Wall using Panel Facia & Techstrap Reinforcement

Client:	Products used:
NATIONAL HIGHWAYS AUTHORITY OF INDIA (NHAI)	• TECHSTRAP POLYMERIC STRIP • NON-WOVEN GEOTEXTILE (PR-20) • TECHCORE CONNECTOR • TECHDRAIN DRAINAGE COMPOSITE
EPC Contractor:	
M/s. KMV PROJECTS LTD.	
Concessionaire:	
M/s. KMVPL KHAMMAM-DEVARAPALLE HIGHWAY PRIVATE LIMITED.	
Manufacturer & Supplier:	Year of construction:
M/s. TECHFAB (INDIA) INDUSTRIES LTD.	2025

Project Description:

M/s. KMV Projects Ltd. awarded the work of the reinforced soil wall to M/s. TechFab India Industries Ltd. TechFab India scope encompassed end-to-end Reinforced soil wall (RSW) solutions, including engineering design, approvals, submission of detailed construction drawings, and supply of high-performance materials such as Techstrap Polymeric Strips, non-woven geotextiles, and associated RSW accessories. The project involved the successful implementation of reinforced soil wall structures with heights ranging from 2.0 m to 10.0 m, ensuring structural stability, durability, and optimized performance in line with project requirements.

Project Challenges:

The project site encountered poor soil strata at the foundation level, resulting in a safe bearing capacity lower than the required bearing pressure for the proposed wall height. This condition necessitated the adoption of an effective ground improvement solution to enhance the soil's bearing capacity and ensure the stability and performance of the reinforced soil wall system.

Solution:

A detailed geotechnical investigation was conducted at the site by the contractor, and the borehole data were analysed to assess the subsurface conditions. Based on this evaluation, a ground improvement scheme was developed involving soil replacement for various height classes below the bottom of the levelling pad (BOL) or the existing ground level (EGL), whichever is lower, using good-quality granular fill.

Additionally, layers of non-woven geotextiles (PR-20) were incorporated to act as a separation barrier between the existing soil and the replaced fill. This prevents intermixing of materials, maintains the integrity of the fill, improves drainage, and enhances load distribution. As a result, it contributes significantly to the overall stability, durability, and long-term performance of the reinforced soil wall system.



Photo 1: Elevation view of RS Wall



Photo 2: Erection of RCC Facia Panel



Photo 3: Installation of TechStrap Polymeric Strip

Salient Features of the Reinforced Soil Walls:

- ❖ Wall Facing Area: 33,509.05 Sqm.
- ❖ No. of Structures: 5
- ❖ Wall Height: 2.0 m to 10.0 m
- ❖ Soil Reinforcement: Techstrap Polymeric Strips
- ❖ Facing: T-shape panel fascia
- ❖ Design Methodology: BS 8006-1: 2010 (Static Condition)
FHWA-NHI-00-043 (Seismic Condition)
- ❖ TFIL's scope of work: Detailed Engineering designs & drawings, supply of materials, supply of Moulds for Panel, & Supervision of construction

Table-1 Shows the properties of the reinforced fill and retained fill considered in the design.

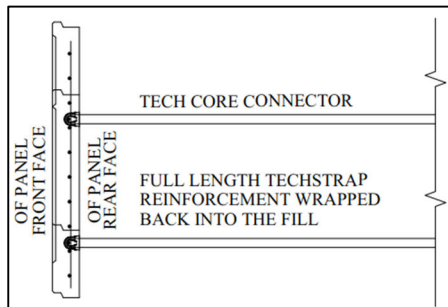


Photo 4: Cross-Section of Panel Showing Connection Details

Table-1

Property/Fill	Cohesion (C) – KN/m ²	Angle of Internal Friction (ϕ) – °	Unit Weight (γ) – KN/m ³
Reinforced Infill Soil	0	33	22.50
Retained Soil	0	33	22.50

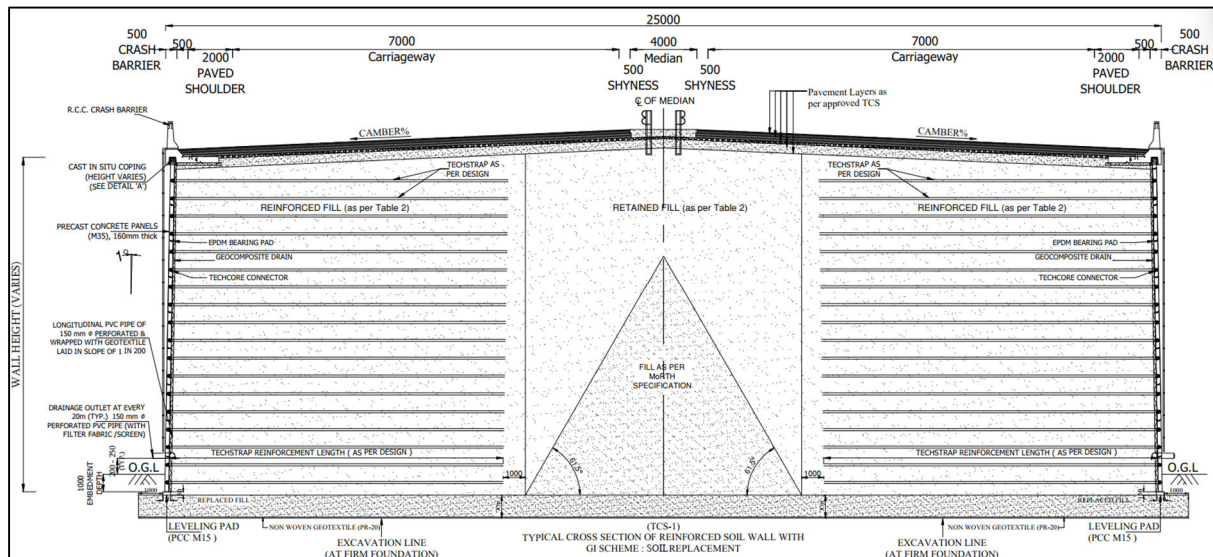


Photo 5: Typical cross-section of the reinforced soil wall, with soil replacement below BOL/EGL,

During the design of the reinforced soil wall, SBC and settlement analyses indicated that the RS wall was not achieving an adequate factor of safety (FOS) against SBC. To meet the required FOS, ground improvement schemes involving soil replacement for various wall height classes were recommended. Granular fill with zero cohesion and an angle of internal friction of 33° was considered for the analysis; accordingly, soil replacement depths were determined based on the respective wall heights.

The design of the walls was carried out using the BS 8006: 2010 for Static Condition & FHWA-NHI-00-043 for Seismic Condition, which comprised checks for external, internal and global stability under static and seismic conditions.

As an alternative to conventional gravel filter media, Techdrain drainage composite, an indigenously manufactured product, is adopted for sub-surface drainage behind the RS wall fascia panels.

Construction of the wall was carried out under the supervision of TechFab India Industries Ltd.



Photo 6: Completed Reinforced Soil Wall with Panel Facia and TechStrap

Conclusion:

The project was successfully completed in April 2025.

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

W: www.techfabindia.com



Ref: KMVPL-KDHPL/KDRP/P-III/RE/CC/002

Date: 14.04.2025

TO WHOM SO EVER IT MAY CONCERN

We hereby do certify that **M/s Techfab (India) Industries Limited** have been engaged by us as Source & RE Technology Provider for Construction of RE wall with Panel Fascia System, consisting of providing method statements, design & drawing, arranging approval, supply of Geogrid, Geotextiles, and RE Wall accessories, providing supervision throughout casting of Panels and erection of RS wall for our project, which details are given under:

Project Name:	Construction of 4 lane access Controlled New Greenfield Highway section of NH-365BG (Khammam- Devarapalle) of length 42.119 km from chintagudem village to Recherla village (Design Ch. Km 63+117 to km 105+236) under Inter corridor Route under Bharatmala Pariyojana on Hybrid Annuity mode in the states of Telangana and Andhra Pradesh (Package –III)	
Work Order No:	KMV/1529-KDRP/WO-REWALL/002	Date: 01.10.2022
Work Order Amount:	Rs.6,03,55,980/- (Incl. GST)	
Client:	National Highways Authority of India	
Project Implementation Unit (PIU):	PIU Khammam-I	
Consultant / I.E.	LEA Associates South Asia Pvt Ltd. In Association with Pioneer Infra Consultants Pvt. Ltd.	
Reinforced Soil System Approval Letter:	LASA-462, LASA-554, LASA-562, LASA-684	Dated: 21/10/23, 25/01/24, 31/01/24, 20/04/24
Main Contractor:	Concessionaire: KMVPL Khammam Devarapalle Highway Private Limited EPC Contractor: KMV Projects Limited	
Structures:	Reinforced Soil Wall with Panel Fascia for Approaches of the Vehicular Underpass, Flyover / Grade Separator having - Maximum Height : 10 m - Minimum Height : 2 m - Completed Facing Area : 33,509.05 Sqm	


KMVPL KHAMMAM-DEVARAPALLE HIGHWAY PRIVATE LIMITED.
CIN: U45204TG2021PTC151241
Registered Office: 12A, 12th Floor, D. No-2-91/5, Trendset Jayabheri Connect, Kondapur, Serlingampally, K.V.Rangareddy (Dist.), Telangana-500084.

Tel: +91 40 2375 7771 | **Fax:** +91 40 2373 5293 | Email: kmvpl.kdhl@kmvgroup.com



Structure wise Details of the RS Wall Facing		
Chainage	Type of Structure	Area (sqm)
65+095	SVUP	7,142.08
68+363	SVUP	5,007.84
69+419	LVUP	5,240.39
73+486	SVUP	9,701.22
75+428	SVUP	6,417.52
Total Area (Sqm):		33,509.05

M/s Techfab (India) Industries Limited have successfully completed their scope of works to our entire satisfaction.

We wish them all the best for their future.

For KMVPL Khammam Devarapalle Highway Private Limited



Authorised Signatory

KMVPL KHAMMAM-DEVARAPALLE HIGHWAY PRIVATE LIMITED.

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