

CASE HISTORY

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GROUND IMPROVEMENT FOR A WAREHOUSE FLOOR SUBGRADE USING TECHCELL GEOCELL AT BHIWANDI, MAHARASHTRA

BHIWANDI, MAHARASHTRA, INDIA



Ground Improvement

Client:	Products used:
-NA-	• TECHCELL GEOCELL - 445X150 - 15,000 SQM • TECHGEO PR 20 - 15,000 SQM
Consultant:	
Shubham Engineers	
Manufacturer & Supplier:	Year of Construction:
TECHFAB (INDIA) INDUSTRIES LTD.	2025

Project brief :

Client (Unnamed) is a major player in warehouse construction and management. At one of the mega warehouse site in Bhiwandi, the client experienced general failure in the floor slab due to the settlement of the subgrade soil. This settlement is assumed due to the higher depth of soil fill, which was not compacted properly and settled due to excess concentrated loading which was not accounted in floor slab design. To avoid this problem in their upcoming warehouse, the client approached TechFab India for a solution to stabilize the subgrade.

Conventionally in order to distribute heavy loads, contractors usually recommend slab with higher thickness, however, this will not help if the subgrade is weak or not compacted properly.

Solution Proposed :

In order to enhance the soil subgrade conditions and to provide a firm support to the top pavement layer which could sustain heavy loading and reduce bearing pressure on the low bearing strata, it was decided to reinforce the subgrade soil with TechCell Geocell (445x150 Type). The section was designed considering the loading conditions and soil infill properties (Fig.1).

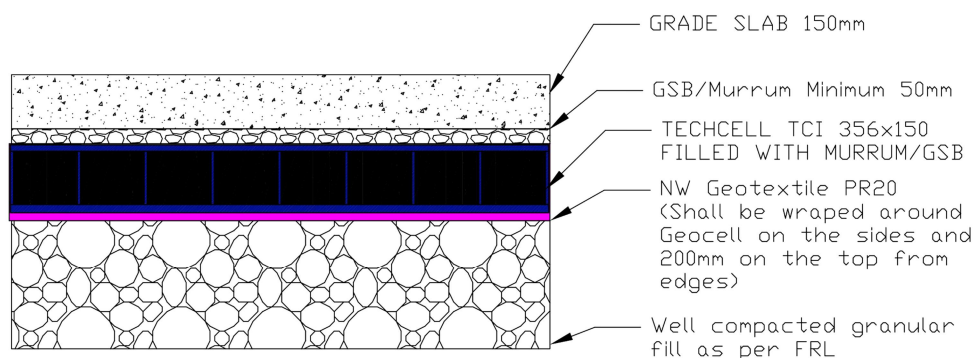


Figure 1 : Proposed section with TechCell Geocell and TechGeo NW Geotextile for Ground Improvement.

TechCell Geocell filled with GSB or non-cohesive coarse granular earthen material helps in reducing the pressure on the subgrade thereby minimizing differential settlement due to the induced pressure and providing basal support to the slab. The interconnected cells improve the modulus of marginal fill material and transfer the load pressure to wider area and hence reduces the strains to permissible limits preventing the soil from losing its structural integrity. Its honey comb like structure helps in retaining and confining soil within, thereby preventing any kind of lateral deformation or liquefaction under induced loading.

In addition to TechCell Geocell, TechGeo Nonwoven Geotextile PR20 was also used below the Geocell layers to act as a separation and filtration layer. With enhanced modulus of the subgrade due to TechCell, the client could reduce the thickness of grade slab from previously heavy design and save costs.

Below Photographs (Photo 1 - 4) depicts the installation scheme at the site as per the proposed design.



Photo 1 : Proper compaction of subgrade fill at OMC & MDD.



Photo 2 : Lying of Non woven Geotextile PR20 above the subgrade.



Photo 3 : Laying and fixing of Geocell over the non woven geotextile.



Photo 4 : Filling of Geocells with granular fill and compaction.

The advantages of Techcell Geocell for pavement stabilization works are as follows:

- Lower capital costs - lower aggregate costs, reduced pavement structure, Enables use of lower quality / local granular infill in base layer
- Lower maintenance costs – decreases pavement degradation, repairs, rehabilitation cycles
- Easy and fast all-weather installation by work crews (trained onsite)
- Reduce infill requirements decrease quarrying, hauling, fuel and carbon pollution

Why Techcell Geocell is recommended?

Techcell is the cellular confinement system created, indigenously manufactured and distributed by TECHFAB INDIA made from High Density Polyethylene stabilized with carbon black which has higher tensile strength and stiffness.

Techcell is expanded on-site to form a honeycomb like structure, which is in filled with granular infill which creates unique cellular confinement system. Techcell will increase the shear strength of the confined soil, and increase load carrying capacity. With granular infill material and holes in Techcell wall, it enhances drainage and release pore water pressure.

Techcell is used for soil confinement, stabilization and reinforcement in wide variety of load support applications.

Designed for challenging roads, Geocells are a new standard in road base reinforcement and ground improvement. Geocells provide a stiffer layer which distributes the loads over a wider area and reduce the stress on the subgrade layer. The increased soil modulus allows you to save greatly reduce the overall pavement thickness.

Known as the “beam effect”, the result is a strengthened base layer, which prevents rut development and degradation of the sub-base layers. Thanks to the stiffness and strength of Techcell Geocell, the soil confinement is retained for entire road design life.

Aggregate resources are becoming scarce and costly. With Techcell Geocells you can use locally available infill materials. Thanks to our innovative technology, the same increased modulus effect can be achieved with marginal fill materials.

Why Techgeo Non woven geotextile is recommended?

Techgeo with its small aperture size, acts as a separator between two types of soil layers, preventing intermixing of soil and promoting the drainage of water through the soil layers.



TechCell Geocell



Techgeo Nonwoven Geotextile



Photo 5 : Compaction and finishing of the cover layer.

Conclusion:

The project was completed successfully and is performing to the intended purpose, to the satisfaction of both the client and contractor. TechCell Geocell provided effective subgrade stabilization, preventing future settlement and ensuring long-term durability of the warehouse floor.

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