

CASE HISTORY

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PAVEMENT STABILIZATION USING TECHCELL GEOCELL FOR KAPADVANJ U. MAHADEV ROAD (Km 0/00 to Km 19/400), KHEDA, GUJARAT KHEDA, GUJARAT, INDIA



Pavement Stabilization

Client:	Products used:
R & B, KHEDA, GUJARAT	• TECHCELL GEOCELL (356 X 150MM TYPE)
Contractor:	
APEX PROTECH LLP	
Manufacturer & Supplier:	Year of Construction:
TECHFAB (INDIA) INDUSTRIES LTD.	2025

Project Brief:

The project "Kapadvanj U. Mahadev Road from KM 0/00 to KM 19/400" involves resurfacing and improvement works to enhance the structural strength, safety, and riding quality of the existing roadway. The scope includes resurfacing of the carriageway, installation of road furniture, construction of retaining walls, and footpath development. Footpath works are specifically proposed between KM 0/00 to 1/00 and KM 9/200 to 19/400 to improve pedestrian safety.

The existing road section is affected by surface distress such as cracks, potholes, uneven riding surface, and edge failures due to aging pavement, heavy traffic, and inadequate drainage. In several stretches, especially during the monsoon season. These issues necessitate resurfacing, structural support, and provision of pedestrian facilities to improve overall road safety, durability, and user comfort.



Photo 1 : Preparation of Surface

Solution:

Considering the challenges outlined above, TechFab India proposed a comprehensive pavement stabilization strategy to develop a high-stiffness, reinforced pavement system. The adopted solution focused on enhancing the load-carrying capacity and long-term performance of the existing pavement through effective subgrade preparation and advanced geosynthetic reinforcement techniques.

The existing pavement crust/subgrade was properly prepared by scarifying, reworking, and compacting to achieve a minimum of 95% of Modified Proctor Density, ensuring a uniform and stable foundation layer. Any weak or unsuitable pockets encountered during preparation were rectified to maintain consistent support across the pavement width. Proper surface leveling and moisture control were ensured prior to the placement of reinforcement layers.

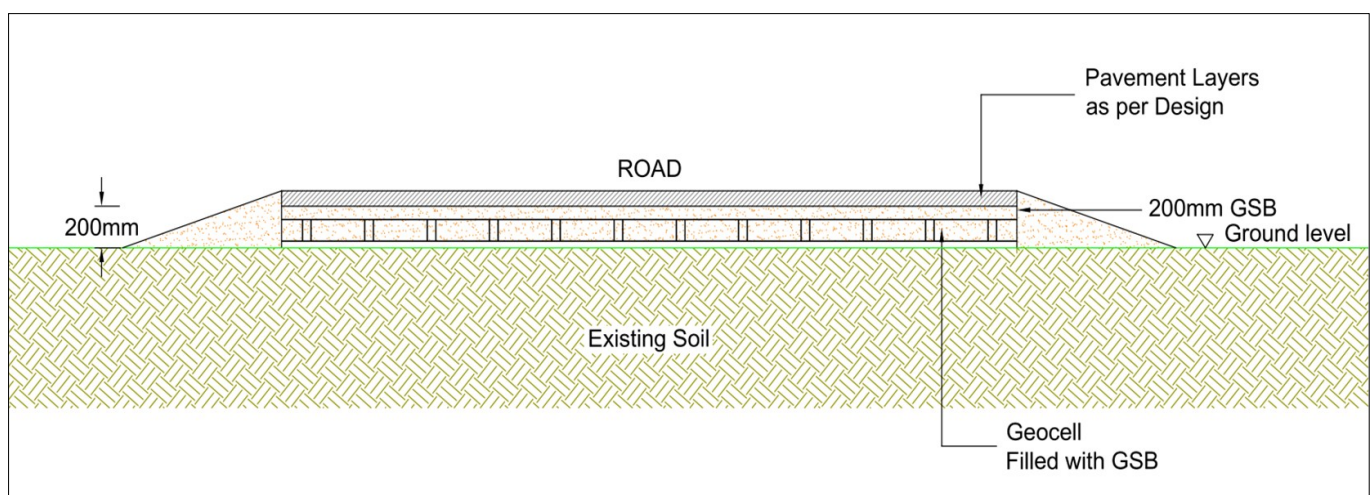
Over the prepared subgrade, TechCell Geocell reinforcement was installed as the primary stabilization system. Geocell panels with a cell spacing of 356 mm and a depth of 150 mm were expanded and securely anchored in position. The cells were infilled with well-graded Granular Sub-Base (GSB) material and compacted as per relevant specifications. The three-dimensional confinement provided by the geocell system enhanced aggregate interlocking, restricted lateral movement, and significantly improved bearing capacity and load distribution.

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.



Typical Cross Section Drawing



Photo 2 : Installation of TechCell Geocell



Photo 3 : Joining the Geocell panels with cable ties

Execution on Site: :

- **Site Preparation:** The work site was well prepared prior to installation. The ground was compacted in accordance with project specifications, and all surfaces were cleared of organic materials and sharp objects.
- **Geocell Stretching and Alignment:** The TechCell Geocell was stretched to cover the maximum required area. The edge cells were anchored using J-pins (permanent or temporary, as required). Hooks were used to properly align and securely fasten the geocell system.
- **Filling and Compaction:** The Geocell system was filled with the recommended infill material and leveled to approximately 30 mm above the cell tops. The infill material was compacted using a roller or compactor as per the engineer's instructions and project specifications.
- **Cell Alignment and Surface Compaction:** Proper side-to-side alignment of the cells was ensured to prevent the loss of infill material. All panel surfaces were thoroughly compacted in accordance with project specifications to maintain overall stability.
- **Pavement Preparation:** Once the Geocell system was installed and compacted, the road pavement was prepared for the laying of bituminous layers. The surface was ensured to be level and stable for the application of the final layer.
- **Inspection and Quality Control:** Thorough inspections were conducted during each phase of installation, from ground preparation to final compaction, ensuring compliance with all engineering specifications and project standards for optimal performance and durability of the Geocell system.



Photo 4 : Filling of GSB Material over TechCell Geocell



Photo 5 : Filling of GSB Material over TechCell Geocell

Conclusion:

The project was successfully completed with TechFab India's TechCell Geocell solution, delivering a stable, durable, and high-performance pavement. The client expressed satisfaction with both the product quality and professional services provided throughout project execution.

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