CASE HISTORY

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GROUND IMPROVEMENT USING GEOCELL AND BIAXIAL GEOGRID FOR RAISING OF THE EXISTING ASH POND BUND AT SRI DAMODARAM SANJEEVAIAH THERMAL POWER PLANT (SDSTPS) AT NELATUR, KRISHNAPATNAM, ANDHRA PRADESH

NELLORE, ANDHRA PRADESH, INDIA

TECHFAB INDIA

Ground Improvement application

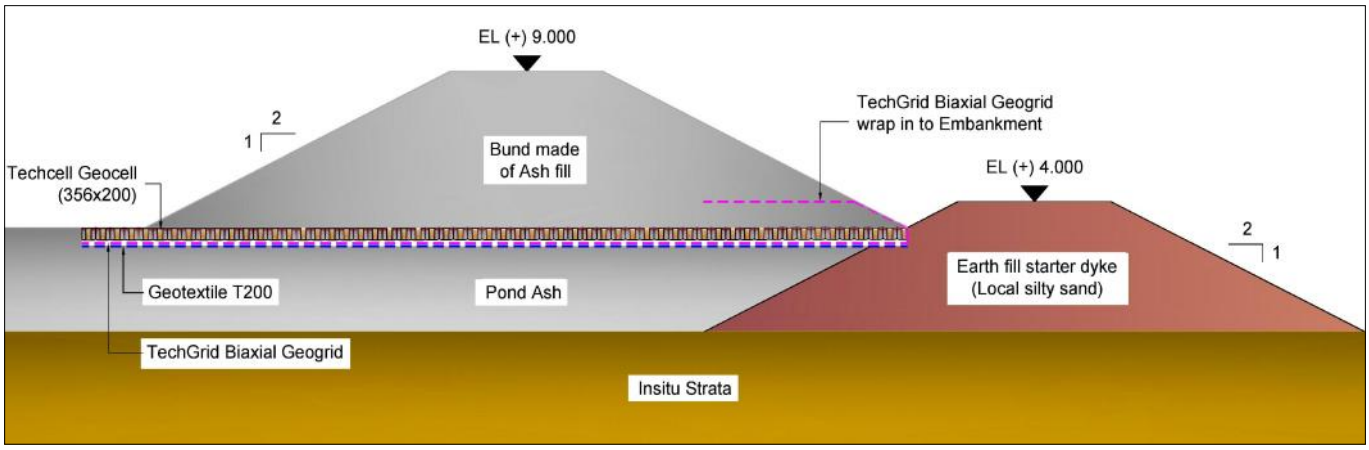
Client:	Products used:
ANDHRA PRADESH POWER DEVELOPMENT COMPANY LIMITED (APPDCL)	• TECHCELL GEOCELL (356X200) • TECHGRID BIAXIAL GEOGRID • NONWOVEN GEOTEXTILE T200
Main contractor:	
RKN PROJECTS PVT LIMITED	
Manufacturer & Supplier:	Year of construction:
TECHFAB (INDIA) INDUSTRIES LTD.	MARCH 2020

Project description and Challenges:

Sri Damodaram Sanjeevaiah Thermal Power Station is located in Nelatur Village, near Krishnapatnam in Andhra Pradesh. The power plant is one of the coal-based power plants of Andhra Pradesh Power Development Company Limited (APPDCL).

APPDCL proposed to establish one unit of 800 MW super critical coal based Thermal Power Plant (Stage-II) as expansion plant to the 2x800 MW Sri Damodaram Sanjeevaiah Thermal Power Station (SDSTPS Stage-I). As a part of this expansion, Ash pond bund created up to 5m height at Stage-I necessitated to raise its height for another 5m.

The proposed ash pond bund has been filled with fly ash. The pond ash is a non-plastic material and possess very low dry density as compared to natural soil. Since the entire segment of the new construction was supported on fly ash, it was very important to adopt any suitable ground improvement technique which can be successively used to improve the bearing capacity of fly ash at the base of the bund and also minimize and control the settlements of the proposed bund. This was the major challenge of this project.



Cross sectional view of the proposed solution

Solution:

Considering all the above aspects, TechFab India proposed ground improvement method using the Techcell Geocell (356x200), TechGrid Biaxial geogrid and Nonwoven Geotextile T200 as the best suitable solution.

Geotextile was laid below the TechGrid Biaxial geogrid and Techcell Geocell. It will act as separator and best filter media at the base of ash bund. This will also help to effective load distribution. And the purpose of providing TechGrid Biaxial geogrid was to ensure proper distribution of the load from the bund and reduce differential settlements. Techcell will also transfer the load pressure to wider area and hence reduces the pressure intensity on the fly ash to permissible limits.

Techcell is the 3D-Honeycomb like cellular confinement system created, manufactured and distributed by TECHFAB INDIA Industries Ltd made from High Density Polyethylene stabilized with carbon black which has higher tensile strength and stiffness. Techcell is more durable over time and is available in different size depending upon weld spacing of cell available in various depths.

Advantages:

- It is easy to install in any weather.
- It does not require skilled labor for installation.
- It is an effective ground improvement solution for weak soils.
- It allows reduction in granular sub base layer.

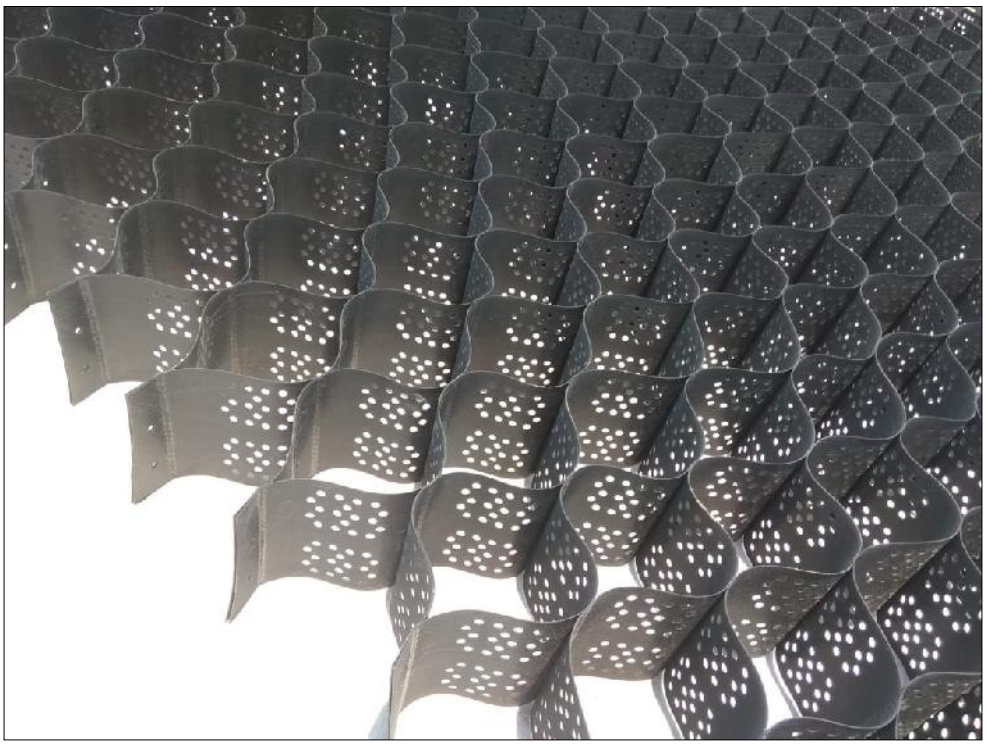


Photo 1 - Techcell Geocell

Why Techcell Geocell is recommended ?

- Techcell is the cellular confinement system created, 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.
- This system can be use full for large parking areas, Storage areas; coastal areas, over poor sub grade for pavement constructions where ground improvement is require and needs to control the settlement.

Photo 2 & 3 - Laying of Geotextile is in progress

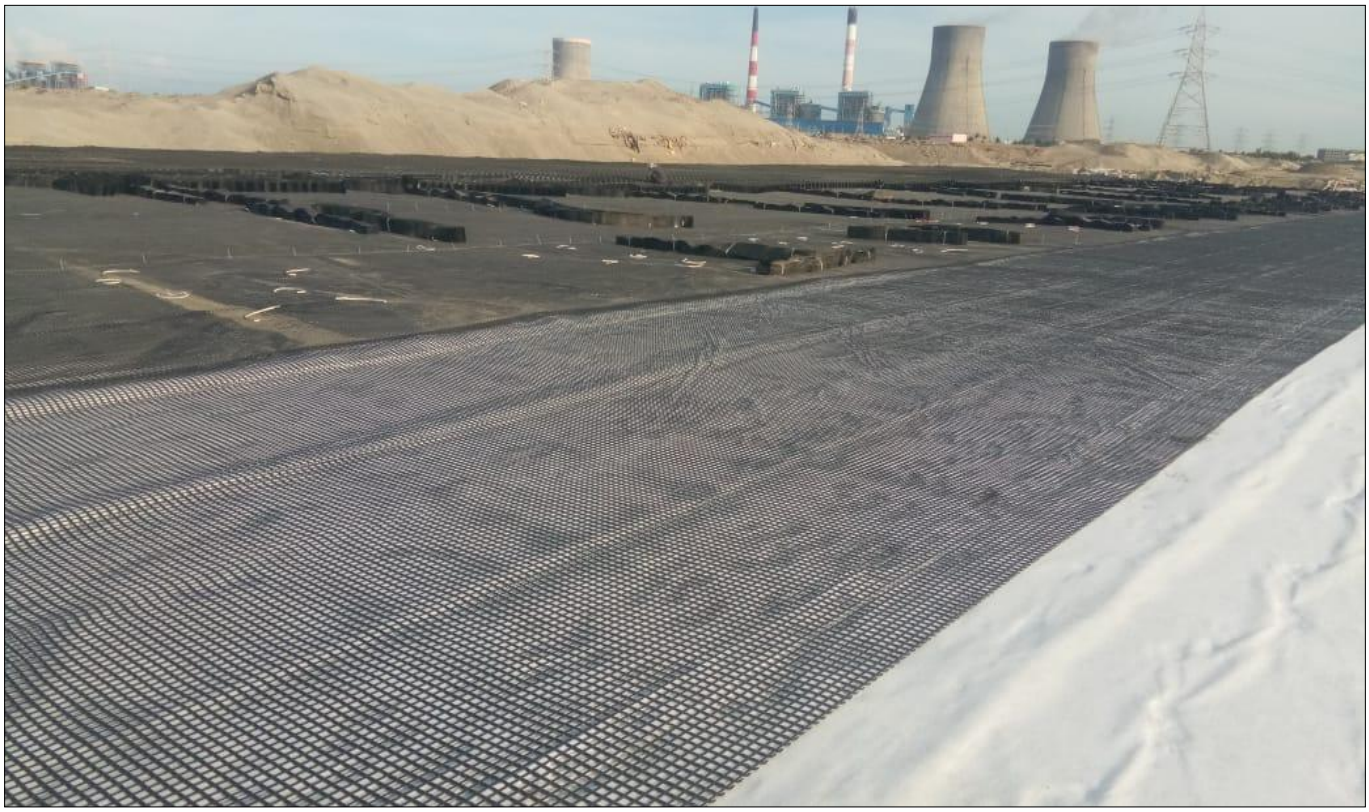


Photo 4 - Laying of TechGrid Biaxial Geogrid over geotextile

Photo 5 - Laying of Techcell Geocell

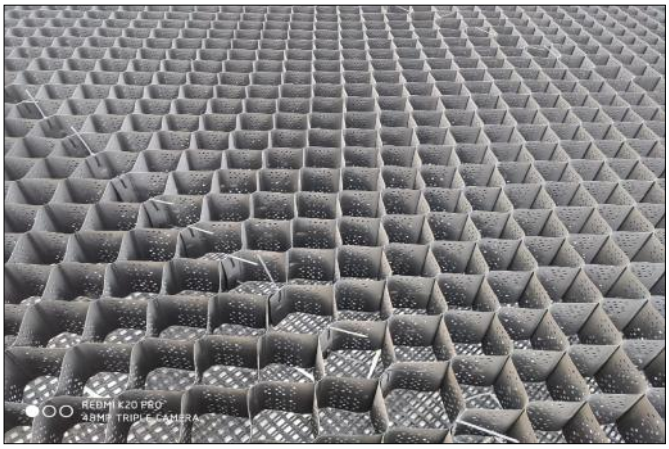


Photo 6 - Laying of Techcell Geocell over TechGrid Geogrid

The 3D confinement of Techcell geocell prevents movement and shearing of soil infill under cyclic loading, while reducing aggregate attrition. The confinement system also maintains soil compaction, thereby providing long term soil reinforcement and structural strength as well as improves moduli of infill materials, while increasing the bearing capacity of the structural pavement layers of load support.

Photo 7 - Spreading of Techcell Geocell is in progress

Execution on Site:

- The work site shall be well prepared before the installation. The ground shall be compacted in accordance with the project specification. All surfaces to be deployed shall be free of all foreign and organic material or sharp objects.
- Soil Infill layer of approximate 50 mm thick is laid and compacted to form uniform surface then as per the design requirement PET Geogrid is laid. PET Geogrid is provided at bottom layer of Techcell Geocell.
- Stretch Techcell Geocell to maximum area and allow it to relax and install J-pins (permanent or temporary) to anchor the edge cells. Align and fasten the geocell by using hooks.
- Fill the system with the infill material suggested and level to approximately 50mm above the cells. Compact the infill material with Roller or compacter as suggested by Engineer in charge or as per the project specification.
- Proper side-to-side cell alignment is maintained to prevent loss of cell infill material. Compact every surface of the panels well as per the specification.

Photo 8 - Expanded Techcell Geocell

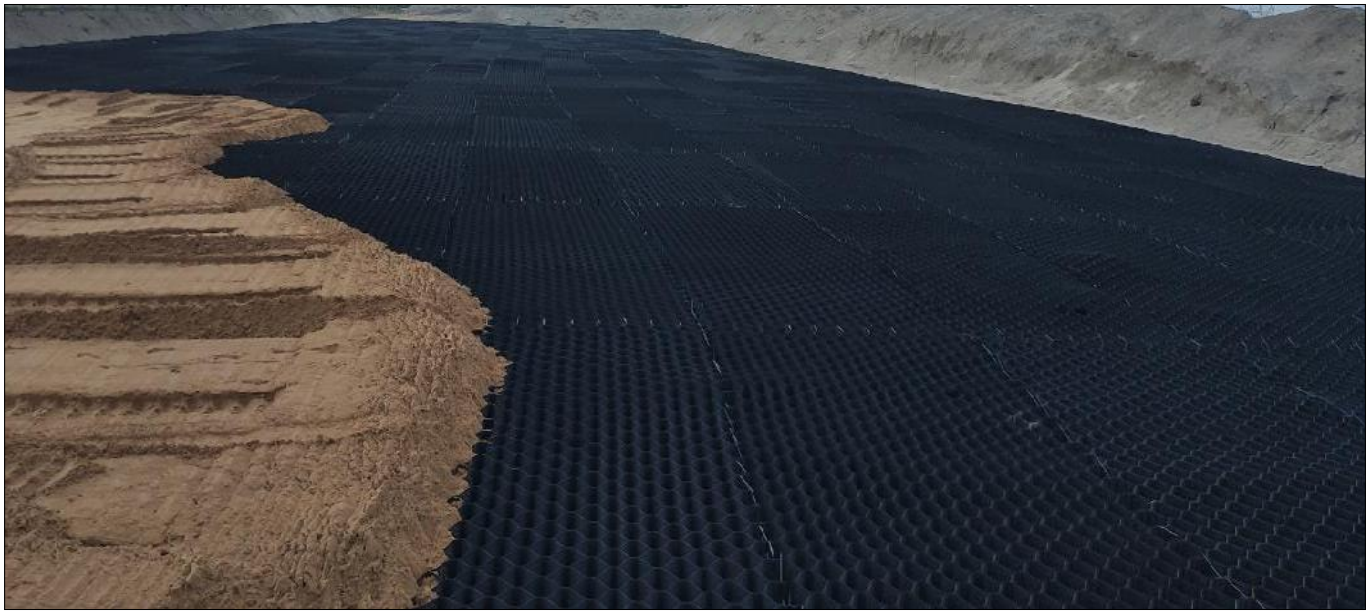


Photo 9 - Filling the Techcell Geocell with the infill material

Conclusion:

The project is completed successfully. The client was very happy and satisfied with product quality as well as quality of work by TechFab India industries Ltd. The Client had very strict quality control system and involved visit to factory and checking the manufacturing process and quality control systems prior to approval of a source. TechFab's systematic quality control ensured easy source approval prior to dispatch.

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