

CASE HISTORY

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REINFORCED SOIL WALL WITH WELDED WIRE MESH FACING FOR CONSTRUCTION OF APPROACHES FOR COAL HANDLING AREA AND HOPPER PIT AND TUNNEL FOR THE POWER PLANT AT WARDHA, MAHARASHTRA
WARDHA, MAHARASHTRA, INDIA



RS Wall with Welded wire mesh facia

Client:	Products used:
LLOYDS STEEL INDUSTRIES LTD.	TECHGRID KNITTED & PVC COATED POLYESTER GEOGRID WITH TENSILE STRENGTH OF 40 - 200KN/M
Main contractor:	
INDRAJEET INFRASTRUCTURE LTD.	
Manufacturer & Supplier:	Year of construction:
TECHFAB (INDIA) INDUSTRIES LTD.	APRIL 2008

Project description:

M/s. Lloyds Steel Industries Ltd is constructing a captive power plant for its existing steel plant at Wardha near Nagpur. The construction involves an approach ramp to be made to the coal handling area and hopper pit and tunnel.

M/s. Lloyds steel Industries Ltd wanted a solution from Techfab India Industries Ltd. to construct the approach ramp that is fast, economical, use of local slag material as a fill for the approaches (they had the problem of dumping the slag)and the structure should be long lasting with proven performance. M/s. Lloyds Steel Industries Ltd decided to use Reinforced soil technology for the construction of retaining walls in view of their proven performance and cost economy.

The design of the walls involved several technical difficulties and the construction had to be completed within a short time. After a rigorous evaluation of various aspects, M/s. Lloyds Steel Industries Ltd. accepted the geogrid reinforced soil wall with a welded wire mesh facing proposed by Techfab India Industries Ltd. as best suited to the project and site requirements and awarded the work to Techfab India Industries Ltd with the following scope of work:

- Detailed engineering of the reinforced soil walls including design, material specifications, construction drawings and construction methodology.
- Supply of Techgrid geogrids and nonwoven geotextile
- Supervision of construction



The Reinforced Soil Wall System

The Challenge:

The design of the walls involved several challenges:

- The maximum height of the ramp was about 10.0 m .
- The fill considered in the design is a composite of good quality murrum and locally available slag material
- The loading considered is the live load of moving truck for transportation of the coal is 100 MT .
- The facing batter of the walls had to be kept as low as possible



During Construction Photograph

Solution:

After a careful evaluation of the project requirements and site conditions a geogrid reinforced soil wall with a welded wire mesh supported wrapped face was finalized as the most optimum solution. Techgrid knitted and PVC coated polyester geogrids, manufactured by Techfab India at their state-of the art ISO 9001:2000 certified plant in Silvassa, were used as the soil reinforcement. Techgrid geogrids are manufactured from select grades of high tenacity, high molecular weight polyester yarns using an advanced weft insertion warp knitting process and coated with a specially formulated PVC plastisol. The high performance characteristics of these world-class geogrids, enabled the walls as high as 15 m, to be designed safely and economically.

The facing comprised a geogrid wrapped face supported by L shaped galvanized welded wire mesh panels with galvanized steel ties at 500 mm spacing. The packing with locally available slag was provided to enhance the rigidity of the facing and to protect the fill material. A nonwoven geotextile filter was used behind the rubble to contain the fill material, which was a composite of good quality murrum and locally available slag material. The overall inward batter of the facing was approximately 5°.

Ability to accommodate appreciable amounts of differential settlements was one of the major reasons for adopting this type of facing. The design of the walls was carried out using the FHWA-NHI-00-043 guidelines and comprised checks for external, internal and global stability under static and seismic conditions. Construction of the wall was carried out under the supervision of Techfab India's supervision.

Salient Features of the Reinforced Soil Walls :

- Wall Facing Area: 800 Sqm.
- Wall Height: 10m
- Soil Reinforcement: TechGrid knitted & PVC coated polyester Geogrids with Tensile Strength of 40 to 200 KN/m
- Facing: Geogrid wrapped face supported by galvanized welded wire mesh panels filled with locally available slag with batter of 5°
- Fill Material: Composite of Local Slag material with good quality murrum
- Design Methodology: FHWA-NHI-00-043 Seismic Zone II
- TFIL's scope of work: Detailed Engineering designs & drawings, supply of Geogrids, Welded wire mesh panels and Nonwoven Geotextile & Supervision of construction



During construction photograph



Completed Structure

Conclusion:

The project was successfully completed in April 2008.

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