TENCATE Miragrid®

PROJECT REFERENCE

Miragrid® GX reinforced soil wall for bridge approaches

Panipat Elevated Highway, India

Project Data

Project	:	Reinforced soil retaining wall for Panipat Elevated Highway Project
Location	:	Panipat, India
Products Used	:	Miragrid® GX40/40, GX60/30, GX80/30, & GX100/30 Polyfelt® WX300/50 & Polyfelt® TS30

Overview

As part of strengthening and widening of existing national highways, National Highway Authority of India has constructed two flyovers and a 10km long elevated express highway on National Highway-1 between Delhi and Amritsar with a view to ease acute congestion in the Panipat city. Construction of concrete retaining walls or reinforced soil retaining walls are the most common method of soil retention in embankment construction on highways passing through urban areas due to the restricted land utility space. Approaches of the express highway at the ramp portions has been planned to retain the earth by constructing the reinforced soil retaining walls using polyester geogrids and concrete fascia panels.

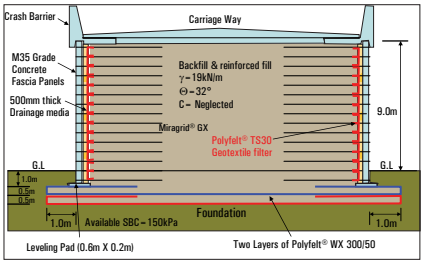
Application

Height of reinforced soil retaining walls for each bridge approach of the flyovers and elevated express highway varies from 0 to 9m over an each ramp length of about 250m. Construction of reinforced soil walls was carried out with concrete fascia panels with compressive strength of 35kPa and Miragrid GX polyester geogrids as soil reinforcement behind the concrete fascia panels. Height of the concrete fascia panels has been limited to 0.6m to facilitate the vertical spacing of the geogrid reinforcement layers to 0.6m. The shape and size of the concrete panels had been designed to have the interlocking arrangements with the adjacent panels and these inter locking concrete fascia panels had been casted at the casting yard and transported to the project site as and when required.

Tongue and groove system had been adopted to connect the geogrid layers to the concrete fascia panels and no joint was allowed in the principal direction of the geogrid reinforcement. A layer of 500mm thick drainage layer along with Polyfelt® TS30 geotextile filter was provided behind the concrete fascia panels as an effective drainage system to drain the infiltrated water in the embankment construction. Half perforated PVC pipe wrapped with geotextile had been laid along the length of the approach at a slightly higher level to the ground level. Compaction of back fill material was done using 10 ton compactor to achieve 95% proctor density and a small size compactor to compact at the edge of the concrete fascia panels.

The stability of the geogrid reinforced soil walls was checked against the bearing capacity of the foundation soil. Multilayer of high strength woven geotextiles was used as a reinforced soil bed to improve the bearing capacity for one of the flyovers where sufficient bearing capacity was not available.

The reinforced soil wall construction was completed successfully on time.



Geosynthetic reinforced soil bed using Polyfelt® WX300/50

Installation of Polyfelt® WX300/50 as basal reinforcement.

Polyfelt® TS filter behind the concrete fascia with Miragrid® GX reinforcement.

Completed reinforced soil wall for bridge approaches.

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