

# Road Base Reinforcement works at NAIA Expressway Paranaque City, Philippines

## Project Data

<b>Project</b>	: Ninoy Aquino International Airport Expressway Project
<b>Client</b>	: Vertex Tollways (San Miguel Group)
<b>Contractor</b>	: D.M. Consunji Construction
<b>Completion Year</b>	: 2015
<b>Material</b>	: TenCate Mirafi® PET High Strength Reinforcement Geotextile, Miragrid® GX 60/60, Polyfelt® PGM-G 50/50

## Overview

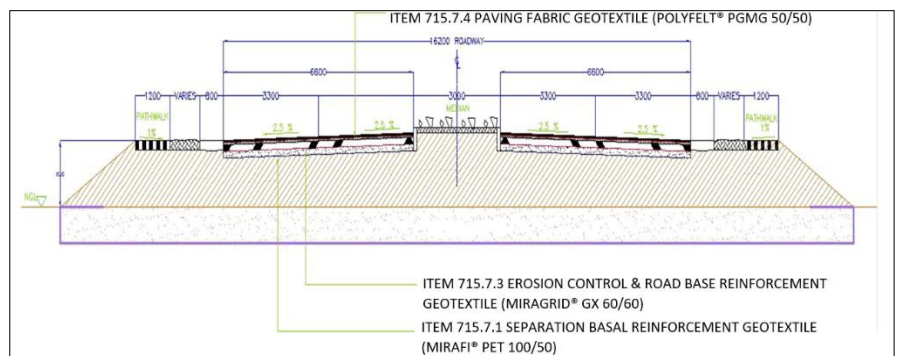
The NAIA Expressway is a 1.6 km elevated expressway system in Metro Manila, Philippines, which links the Metro Manila Skyway to Ninoy Aquino International Airport and Entertainment City. The roadway is the first airport expressway in the Philippines.

Localized failure of the road embankment and variable settling of the road due to soft soil foundation was a challenge in the design along the extension expressway entering the reclaimed land of Entertainment City. Uneven roads and surface cracking may occur if these problems will not be considered in the design.

## Solution

TenCate's engineered high strength geotextiles was chosen to be the most cost-effective solution for the project.

Mirafi® PET reinforcement geotextiles were used to address the localized failure of the road embankment.



Cross-section for the road base reinforcement

The high strength geotextiles act as a separation and reinforcement to the soft soil foundation which allows vertical loads to be transferred to the geotextiles as tensile stresses. This would prevent the sub-base aggregate from sinking into the subgrade and being lost.

TenCate Miragrid® Geogrids were used for subgrade stabilization. The high strength geogrid interlocks the granular fill into place thereby, maintaining the structural integrity and stableness of the granular fill layer.

Lastly, Polyfelt® PGM-G paving fabrics were used as a waterproofing and stress absorbing membrane interlayer within the pavement structure.



Mirafi® PET 100/50 geotextile laid into soft soil foundation



Embankment over Mirafi® PET 100/50 geotextile

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## Construction

Installation of the Mirafi® PET geotextiles was carried out by laying the reinforcement geotextiles in the traverse direction of the embankment. Geotextile tensile strength of 100 kN/m were used to reinforced the embankment. Thereafter, material fill for the subbase course was then carried out over the Mirafi® PET reinforcement geotextile.



Miragrid® GX geogrids laid after the subbase course



Paving rig used for the lay down of the paving fabric

A tensile strength of 60 kN/m Miragrid® GX geogrids were then placed between the interface subbase and base course material, as it interlocks the granular fill material. A 300 mm minimum overlap from side and ends of the geogrids were applied. The geogrid's interlocking mechanism acts as a homogenous material wherein applied or stress load is spread all over the basal reinforcement grids thus eliminating the isolated or applied load in one weak area.



Base course material filled over Miragrid® GX geogrids



Installed Polyfelt® PGM-G for asphalt reinforcement

To install the Polyfelt® PGM-G 50/50, CRS 2 bitumen was sprayed at the rate of 1.8 l/m<sup>2</sup> along the pavement to impregnate and seal the geotextile paving fabric as well as bond it to both existing pavement and the new overlay. The geotextile paving fabric was then unrolled using a paving rig for uniform and smooth laying. Once it was saturated, a 50 mm SMA Asphalt was placed over the installed Polyfelt® PGM-G paving fabric.



Completed expressway with road base reinforcement

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