

NAIA EXPRESSWAY, PARANAQUE CITY, PHILIPPINES

Road base reinforcement with MIRAFI and MIRAGRID



Industry: Transportation
Application: Roadways
Location: Philippines
Product: **MIRAGRID®**, **MIRAGRID® GX 60/60**,
MIRAFI® Polyfelt® PGM-G 50/50

Overview

The NAIA Expressway is a 1.6 km (1 mile) elevated expressway in Metro Manila, Philippines. It connects the Metro Manila Skyway to Ninoy Aquino International Airport and Entertainment City, serving as the first airport expressway in the country.

The design of the extension expressway faced challenges due to localized failure of the road embankment and variable settling caused by a soft soil foundation. Failure to address these issues in the design may lead to uneven roads and surface cracking.

Challenge

Solmax's engineered high strength geotextiles were selected as the most cost-effective solution for the project.

MIRAFI PET reinforcement geotextiles were utilized to address the localized failure of the road embankment. These geotextiles act as a separation and reinforcement layer for the soft soil foundation, enabling the transfer of vertical loads as tensile stresses. This prevents the sub-base aggregate from sinking into the subgrade and being lost.

To stabilize the subgrade, **MIRAGRID** geogrids were employed. These high strength geogrids interlock the granular

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CASE STUDY

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fill, maintaining the structural integrity and stability of the granular fill layer.

MIRAFI Polyfelt PGM-G 50/50 paving fabrics were utilized as a waterproofing and stress absorbing membrane interlayer within the pavement structure.

Solution

Installation of the **MIRAFI** PET geotextiles involved laying them in the traverse direction of the embankment. Geotextiles with a tensile strength of 100 kN/m (569.81 lb/ft) were used for reinforcement. Subsequently, material fill for the subbase course was placed over the **MIRAFI** PET reinforcement geotextile.

MIRAGRID GX geogrids with a tensile strength of 60 kN/m (341.89 lb/ft) were positioned between the subbase and base course material, interlocking the granular fill material. A minimum overlap of 300 mm (11.81 in) from the sides and ends of the geogrids was applied. The interlocking mechanism of the geogrids ensures even distribution of applied or stress loads, eliminating isolated weak areas.



For the installation of **MIRAFI** Polyfelt PGM-G 50/50, CRS 2 bitumen was sprayed at a rate of 1.8 l/m² (0.37 gal/yd²) along the pavement. This impregnated and sealed the geotextile paving fabric while bonding it to both the existing pavement and the new overlay. The geotextile paving fabric was then unrolled using a paving rig to ensure uniform and smooth laying. Once saturated, a 50 mm (1.97 inches) SMA asphalt was placed over the installed **MIRAFI** Polyfelt PGM paving fabric.



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