



## Case Study

**application** Subgrade Improvement  
**location** San Juan, Puerto Rico  
**product** Mirafi® HP570

**job owner** INTERSHIP  
**engineer** INTERSHIP/TenCate™  
**contractor** ALCO Corporation

TenCate™ develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

### THE CHALLENGE

INTERSHIP needed to repair the container storage area on their Puerto Nuevo Port Zone terminal facility. The relatively flat area was covered by sand, coarse gravel and exhibited large potholes and heavy deterioration making the area almost unusable. The soil study reflected 5 to 6 feet of weak organic material composed of soft clays, mixed with wood fragments and even peat in some areas. The study also determined that the soft subgrade soils had a soaked CBR value of 1.0. Kalmar-type forklifts are used to move and store containers within this area. A maximum axle load of 184 kips was used for design with a tire pressure of 145 psi.

### THE DESIGN

INTERSHIP realized the site would require much more than over excavation of the unsuitable soils and back-filling to stabilize the site. They also wanted to limit the undercut required to stabilize the site due to ground water issues. The owner had a few different geosynthetic manufacturers submit their recommendations based on the site specific project needs.

Ultimately the recommendation of Mirafi® HP570 at the subgrade base interface to stabilize and separate the dissimilar materials along with another layer of Mirafi® HP570 in the base course to reinforce it allowing for a reduction in thickness was chosen for the site. The final pavement cross section held approximately 21 inches of graded base course aggregate with 4.5 inches of asphalt treated base and 4 inches of asphalt wearing surface.



Wide rolls allow for less material waste due to the required 3ft of overlap.



The use of two high strength geosynthetic layers allowed for the required pavement strength while minimizing the overall thickness.

#### THE CONSTRUCTION

TenCate's distributor in Puerto Rico, JM Caribbean Distributors, scheduled 45,000 square yards of the material to be shipped directly to their site starting in December of 2007 to get the project started while the total site needs were determined. The balance of the material, 182,000 sq yards, were delivered to the site in March of 2008. The installation of Mirafi® HP570 was completed during May of 2008. The asphalt base and wearing surface were placed as different areas were completed and were reopened to traffic immediately after construction.

#### THE PERFORMANCE

By using Mirafi® HP570, INTERSHIP was able to obtain the separation of the engineered cross section from the existing weak onsite soils and at the same time obtaining the design strength needed to support the extreme loadings. The pavement structure will be more reliable and with Mirafi® HP570, the owner was able to reduce costs in the excavation and replacement of the base course material, at the same time increasing its performance.



Reducing the undercut, by reducing the overall pavement thickness, allowed for lesser site disruption and faster construction.



The completed pavement allows for the easy access of the heavily loaded fork lifts in the container yard.

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