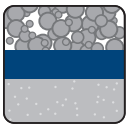
TENCATE Mirafi®


# Case Study

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| application | Embankment on Weak Subgrade | job owner | Ministry of Transportation Ontario |
| location | Timmins - Ontario, Canada | engineer | Thurber Engineering |
| product | Mirafi® PET 600/100 | contractor | AECON |

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

Provincial Highway 101 crosses the Frederickhouse River approximately 30 km (8.6 mi) east of Timmins. By 2003, the bridge crossing the river had come to the end of it's service life and required replacement. Site constraints dictated that the replacement bridge had to be constructed in the same location as the former bridge.

In order to meet the above constraint, a detour, including a three span temporary bridge, had to be constructed directly adjacent to the aging steel-truss structure.

## THE DESIGN

To accommodate the loads of the approach embankments, the geotechnical consultants specified a uni-axial geogrid with a Long Term Design Strength of 200kN/m.

However, no geosynthetic manufacturer makes a geogrid that strong. Therefore, the Long Term Design Strength could only be met by using multiple layers of geogrid. Some geogrids met the specification with two layers, while others required three or more layers with large overlaps to make the joints between adjacent geogrid panels.

## THE CONSTRUCTION

The job was originally bid with two layers of Miragrid® 22XT woven polyester uni-axial geogrid. At the time of the tender, an alternate using high strength woven geotextile was also proposed.

The alternate solution was a single layer of Mirafi® PET 600/100 woven polyester geotextile. This fabric has a published Long Term Design Strength (in sand, silt, and clay) of 284 kN/m. After the contract award, AECON requested a proposal for a high strength woven solution. A proposal was submitted, and accepted by the owner and consultants.

Individual panels, 5m (16.4ft) wide by approximately 30 m (98.4ft) long were factory sewn approximately 30 m (8.4ft) long were factory with a seam strength of 50kN/m. The panels formed were 25m x 30m (82ft x 98ft). These panels were concertina folded, then rolled onto steel cores at the factory. Individual roll weights averaged 1,000 kg (2,204.5 lb).

Using an excavator and a backhoe, the installer placed the panels directly onto the sub-grade with a 1000 mm (39 in) overlay at the joint between adjacent panels. The largest area covered (190m x 30m) was installed using nine sewn panels in less than a day.

## THE PERFORMANCE

Total material supplied exceeded 9000 square meters (10,764 $yd^2$), with a savings of approximately 35% over the cost of supplying and installing geogrids.

The design originally specified a geogrid with LTDS of 200N/m. Instead of multiple geogrid layers, one layer of Geolon® PET 600/100 was the ultimate solution.

The woven polyester geotextile was fabricated into 25m X 30m (82ft x 98ft) panels.

The largest area covered was 190m x 30m (623ft x 98ft) and was installed using nine sewn panels in less than a day.

Using an excuavator and a backhoe, the installer placed the panels directly onto the subgrade with a 1000mm (39 in) overlay at the joint between adjacent panels.



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