



Case Study

application	Subgrade Stabilization
location	Vanderhoof, BC
product	Mirafi® RS580i

job owner	L and M Lumber
engineer	TenCate Geosynthetics
date of installation	July 2015

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

Founded in 1962, Sinclair Enterprises began as a lumber wholesaler for local mills in Prince George. Over the years Sinclair Group Forest products as they are now known, acquired a number of mills in the Prince George Area. One of these mills was L&M Lumber Co. (Vanderhoof, 1972).

L&M Lumber produces high-quality 2x3, 2x4 and 2x6 studs for domestic and export markets, as well as 1x2, 1x3 and 1x4 board stock. These products are shipped within Canada and are also exported to the United States, Japan, South Korea, the United Kingdom and the Netherlands.

With the need for added capacity to support growing markets, L&M lumber needed to expand their yard to store timber. The new area to be developed approximately 16,000m² consisted of a very soft silty clay material with a high water table. These yards are always associated with very heavy wheel loads in this case a Letourneau 2794 carrying a max highway logging truck load of 39 tonnes.

The owners contacted the local TenCate representative looking for a solution that would minimize the amount of aggregate required and provide accessibility year round for their equipment.

THE DESIGN

Due to the existing soil conditions a TenCate Mirafi® RS580i high strength geosynthetic was proposed. The owner had previous experience with biaxial geogrids but was intrigued by the new generation Mirafi® RS-Series high strength geosynthetics shown to him. The back up docu-

mentation and research on the product convinced them to use the RS products. In addition, it was shown through preliminary analysis that the Mirafi® RS580i would save the owner on aggregate as compared to the alternate triangular geogrids. Mirafi® RS-Series products have excellent soil reinforcement separation and filtration characteristics, all key properties required to ensure a long-term solution.

Based on previous geotechnical work that had been performed on the yard, a CBR of 1 was used for the subgrade strength.

Wheel passes were determined to be 10,000 passes over the life of the yard and the wheel loads were calculated to be 222kN. It was determined that a rut depth of 50mm was acceptable. These parameters were required to do an unpaved analysis using the Giroud-Han design methodology which is the industry standard for unpaved road design.

Based on these parameters it was determined that with Mirafi® RS580i, the aggregate base thickness could be reduced from an unreinforced thickness of 1500mm to 525mm. This would save a significant amount of money in earthworks.



Soft, silty clay material prior to placement of geosynthetic.



Placement of the geosynthetic.

THE CONSTRUCTION

Installation started July of 2013. The site was first graded to ensure proper drainage and then proof rolled with a smooth drum roller. The next rolls of Mirafi® RS580i were rolled out with a 500mm overlap. A sandy gravel material was used as the base. Base material was end dumped on existing base material and then bladed out with a bulldozer followed up by compaction. Compaction was 95% SPD.

THE PERFORMANCE

The yard has gone through it's first winter and performed extremely well through the spring thaw. The Letourneau loaders are operating with no rutting and plant operation has not been interrupted. By incorporating Mirafi® RS580i into their project, L&M Lumber was able to save over \$150,000 on the project compared to the conventional un reinforced design.



Base material being end dumped on the existing base material.



then proof rolled with a smooth drum roller



Figure 4

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