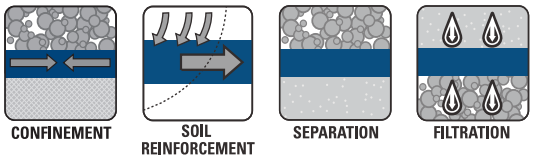
TENCATE Mirafi®



Case Study

application	Subgrade Reinforcement
location	St. Maries, ID
product	Mirafi® RS580*i* & 160N
job owner	Potlatch Corp.
engineer	TenCate Geosynthetics
contractor	Potlatch Corp.
date of installation	April - May, 2011

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

Most large logging yards have to deal with large quantities of unsuitable, saturated soils, generally a result from the constant watering and storage of logs. The Potlatch Corporation in St. Maries, ID tried adding rock to the soil to create a stable runway for the large LeTourneaus (forklift's) to operate on. However, with up to 80-ton machines running on the gravel, the rock was pushed into the saturated soils with little effort. They tried using regular separation textiles, to no avail, and also biaxial and multi-axial geogrids. The separation fabric failed under the weight of the machine, and the geogrid did not provide separation nor could it hold up under the large rock size and weight of the LeTourneaus. The Potlatch Corporation contacted White Cap Construction Supply in Spokane, WA for help with this project. TenCate Geosynthetics was then brought in to help find a solution to the ongoing problems with the log storage yards. TenCate was asked to help stabilize Log Yard B with a cost effective solution that would last for more than 15-20 years under the traffic of the heavy machines and constant watering. By stabilizing this area, and providing a level working surface for the machines to run on, it will reduce long term costs of fuel consumption, maintenance & parts costs, and greatly reduce the cost of adding gravel/rock to the area every year. To accomplish this, the area will need to be regraded and a stable platform must be built to handle the increased loading of the machines (Figure 1).

Figure 1: Log Storage Yard runway prior to stabilization

THE DESIGN

Next, the soils at the site were extremely soft (CBB ≤ 1), and with the high groundwater and constant addition of water to the storage yard, this project was a challenge. Creating a level storage yard that would be stable over very soft ground while continually adding water to it was not an optimum choice for any engineer. The first step in the design was to provide somewhere for the water to go. It was determined that using the existing ditches between the runways as "french-drains" would be the most cost effective solution. This step was critical because a large level yard was needed to begin the stabilization process. Jointly, TenCate and Potlatch chose to use Mirafi® 160N nonwoven geotextile to line the "french-drains" prior to adding the clean ballast rock in order to keep the ballast rock clean of fines for many years to come.

Next, a strong geosynthetic was needed that would provide reinforcement, especially in the cross-direction, provide high water flow and have excellent separation characteristics. Mirafi® RS580i* was chosen because it met all of the requirements of the Potlatch Corporation. It provides a high flow rate, separation, high interaction with the rock, and very high strength at low-strain in the cross-direction. With the addition of 2-3 feet of rock over the Mirafi® RS580i, it was determined the log storage yard could be stabilized.

THE CONSTRUCTION

The construction took place during the very wet and rainy spring months of April and May, 2011. The first step was to install the french drains. (See Figure 2).

Figure 2: French Drain using Mirafi® 160N and clean ballast rock.

TENCATE™ materials that make a difference

The design called for wrapping the entire ditch filled with clean ballast rock; however, the ditches were a little wider than expected, so the top of the ditch was not wrapped. Mirafi® RS580i was going to be placed directly on top of the drains, so it was determined it would work as a suitable filter for the top of the french-drains. The next step was the placement of Mirafi®RS580i (see figure 3). The contractor used a track hoe with tow straps to deploy the high-strength rolls across the soft subgrade. Approximately 1 - 3 feet of overlap was placed to ensure proper coverage during installation over such soft soils. After the rolls were placed, a large layer of 8 - 12 inch crushed rock, was placed directly onto the geotextile, and capped with approximately 12 inches of 6" crushed rock (see figure 4). The area was compacted using wheel equipment and a small roller.

THE PERFORMANCE

The Potlatch Corporation couldn't be more pleased with the results of their project. The log storage yard is holding up to the weight and beating of the heavy equipment. They are saving valuable dollars by not having to replace parts and by using less fuel, and are generally running a faster operation due to the stabilization of the super soft soils: "Thanks to TenCate geosynthetics, we are able to run our operation faster."

*Patent Pending

Figure 5: Completed machines running at full speed over stabilized ground.

Figure 3: Installation of Mirafi® RS580i using a track-hoe with 1-3 feet of overlap.

Figure 4: Placement of fill rock over Mirafi® RS580i. Contractor statement: "This stuff is a lot more durable than I thought."

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