



Case Study

application | Drainage and Separation
location | Redmond, WA
product | Mirafi® 160N

job owner | Faith Farm
engineer | Private
contractor | Northwest Dirtworks

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

Faith Farm is a large equestrian facility located outside of Redmond, WA in King County. The facility has many horse riding trails that often become flooded and/or saturated during the wet Pacific Northwest winter months, causing the closure of many of the trails. To make matters worse, burrowing moles were creating large voids in the trail system that were dangerous to the passing horses. The owners of the facility wanted to find a way to improve these closed riding trails so that they could remain open, even during the winter months. The owners hauled in large loads of 2" minus rock to bridge over the saturated soils and make an unfriendly environment for the moles. Unfortunately, the rock quickly sank into the muddy soils and stopped working.

THE DESIGN

TenCate™ engineers determined that a permeable separation geotextile was required below the riding trails. The permeable separation geotextile would keep the rock clean, while allowing the pore water pressure to escape through the fabric into the crushed rock. The separation geotextile also improved long-term bearing capacity of the rock layer by not allowing contaminants to lubricate the clean rock particles and lower the friction angle of the rock. Mirafi® 160N, a medium weight polypropylene nonwoven geotextile, was determined to be best for use as a permeable separator on the equestrian facility trail system. Mirafi® 160N offers high water flow, excellent separation capabilities, and its needle-punched nonwoven polypropylene construction provides a mole-proof barrier as well (small rodents don't like to chew through polypropylene fibers).



Low lying muddy area that floods during the winter months. Contractor placed a 6 inch PVD drainage pipe to allow free water flow underneath the subgrade



Mirafi® 160N was placed on the wet saturated muddy soils.



Placement of 5/8" crushed rock over the Mirafi® 160N geotextile

THE CONSTRUCTION

The contractor decided to perform the work of installing the new gravel during the warm summer month of July, also when the water levels and runoff levels are at their lowest in the wet Puget Sound area. The contractor placed Mirafi® 160N directly over the wet silty saturated subgrade soils. Next, a clean 5/8" crushed rock was placed directly on top of the geotextile. The geotextile kept the rock from mixing with the saturated muddy subgrade. The contractor also placed Mirafi® 160N across the mole paths where there was many small tunnels and voids from the moles burrowing near the surface.

THE PERFORMANCE

The proper selection of a geotextile for this project was crucial. Choosing Mirafi® 160N provided excellent drainage and separation between the rock and saturated subgrade, while inhibiting rodent tunneling/burrowing activities in the vicinity of the trail system.

Since the time of construction, there have been no new rodent holes opened in any of the locations where Mirafi® 160N has been installed. The trails are now open year round (even during the wettest winter months) - thanks to TenCate.



Horse riding trails leading into the forest.



Finished trail in the wet winter months, after using Mirafi 160N. No water or rodents have forced the closure of trails during this winter season.



Burrowing rodents like moles; create unique dangers for riding horses on the trails. Mirafi® 160N was used to bridge this hole and prevent rodents from trying to burrow to the surface again.

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