



Case Study

application | Haul Road - Wind Energy Farm
location | American Falls, ID
product | Mirafi® HP570

job owner
engineer
contractor

CG Energy
EHM Engineers, Inc-retained
Burks Construction

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

Soil borings on this wind energy farm job site showed collapsible silt and silty clays, both of which can undergo high deformation from wetting and drying cycles due to the timing of construction. In spring 2011, the site experienced very wet construction conditions. There was a concern that these soils, especially in the low areas, could lose their support capabilities after a one-truck pass. There could be 50 to 100 truck passes per tower along with other types of construction equipment. A roadway needed to be developed that would support construction traffic during these critical periods.

THE DESIGN

The project geotechnical engineer recommended an access road section of multi-axial geogrid and a 4 oz. nonwoven fabric with 9 inches of aggregate. EHM estimated a subgrade soil strength CBR = 1.1%. Roads on the project are proposed to be 16 ft. wide with an 8 ft. wide section to move the crane into each turbine site.

Based on the above criteria, high-strength Mirafi® HP570 geotextile was chosen to be used on the vegetation stripped subgrade, in low/potential soft areas. The owner/contractor decided to initially place Mirafi® HP570 and 9 inches of 3-4 inch minus angular aggregate. Any rutting would need to be maintained with additional material. The final haul road section would then involve placement of 3 more inches of surface aggregate (1" minus). Where the soil is firmer (CBR = 2 and above), the aggregate thickness was reduced to a minimum thickness of 6 inches.

A geotextile was preferred over a geogrid because it would keep the rock from penetrating into the clay subgrade. A geogrid, by definition, has openings which allow contamination. That is why geogrids work best if confined within the aggregate section and not on a clay base. A two layer system was not considered to be practical for this project application.



Test section using a 4 oz nonwoven geotextile and a multi-axial geogrid with 3" minus basalt stone. Picture shows the 3" stone ruptured the multi-axial grid after the first few passes.



Clay/silt conditions after an early spring snow fall.



Haul road constructed with Mirafi® HP570 as designed.

THE CONSTRUCTION

Two performance test sections were required by the owner and contractor. The conditions were very wet with some subgrade areas still frozen. The first section was installed using a nonwoven material and a multi-axial geogrid. After these two irregular widths of products were installed by the contractor, 12" of 3" minus 100% crushed basalt was installed. These two products did not survive the test section. Rupture of the multi-axial geogrid happened after only a few truck passes. The second section was installed using one layer of Mirafi® HP570 woven geotextile. Again, 12" of 3" minus 100% crushed basalt was installed.

THE PERFORMANCE

Burks Excavation LLC is currently building 18 miles of new access roads in some of the worst conditions. They are working with soils known as collapsible silts with a CBR rating of 1 or less. As the clearing and grubbing of road sections began, they quickly realized that there would be very little chance of bridging over the poor soils, and after losing 3 to 4 feet of rock in a small test section, it was decided to try Mirafi® HP570 geotextile. The results were amazing. Mirafi® HP570 was placed as recommended and the road construction began. Once the installation began, they were able to cover 2650 linear feet in just one day. TenCate Mirafi® HP570 is highly recommended when building roads in areas with poor sub-grade material. Due to the soil conditions, weather and the construction schedule, Mirafi® HP570 allowed construction to start early and continue through the elements.



Placement of Mirafi® HP570 and 10" to 12" of 3" minus basalt stone.



Layer of 4 oz nonwoven and multi-axial geogrid with placement of stone. This picture shows 2 different widths of material with kinks and folds in the material. There is not full geosynthetic coverage over the subgrade surface.

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