



Case Study

application | Subgrade Restraint
location | Garnett, KS
product | Mirafi® HP570

job owner | Kansas Department of Transportation
engineer | Kansas Department of Transportation
contractor | Fretco, Inc.

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

A new Ethanol Plant was being built in Garnett, KS. With the addition of the Ethanol plant, a large increase in truck traffic was expected at the intersection of Hwy 59 and Hwy 169. The existing pavement was always in bad condition leading into the intersection. With the increased truck traffic and the fact that the trucks will be accelerating and decelerating into the intersection, the State DOT decided to replace the pavement.

The existing soil was very soft. When a Kansas DOT Geotech was asked what the CBR was, he simply replied that it was "bad." The area also had a very high water table that affected the subgrade strength. These factors were the main cause of the existing pavement to be in poor condition.

The state redesigned the pavement to withstand the increased truck traffic while improving the subgrade. The project includes the intersection to become a roundabout. It is the Kansas DOT's largest roundabout to date.

THE DESIGN

Two options were looked at to improve the subgrade. The first was to use Mirafi® HP570 woven geotextile placed directly on the subgrade. The second option was to use a biaxial geogrid with a nonwoven geotextile separator underneath it. After looking at both options, it was obvious that the Mirafi® HP570 was the better solution. The HP570 not only provided a much higher tensile strength at low strains, but it also allowed significant cost savings because it was a single layer as opposed to laying out



The Mirafi® HP570 is rolled out directly on the subgrade to stabilize the soft soils.



Base Rock is placed directly on the Mirafi® HP570.



The Base Course is reinforced with the Mirafi® HP570.

both a geogrid and nonwoven geotextile. With the soft soil conditions and high water table, separation was a key factor in the design, and the geogrid alone will not provide the separation needed which could cause failure of the pavement.

THE CONSTRUCTION

The HP570 was laid directly on the subgrade. The contractor installed 18" of base course and a concrete pavement above the fabric.

THE PERFORMANCE

The HP570 allowed the contractor to not have to replace the existing subgrade with new material. This allowed the construction of the pavement directly on the existing subgrade. Although the subgrade was dry due to the lack of rain, ruts still formed in the subgrade due to the construction traffic. After the HP570 was placed on the subgrade and the initial base course layer, the ruts were no longer formed by the construction equipment.

The finished project looks great and 6 months after the pavement was built, there are no signs of failure and the high truck volume has not been a problem.



Above: The contractor was able to quickly install the Mirafi® HP570 and Base Rock without any costly delays.
Below: The Mirafi® HP570 was used to increase the service life of the Highway, while allowing a reduction in construction costs.



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