



Case Study

application	Subgrade Stabilization & Reinforcement
location	Arkadelphia, AR
product	Mirafi® HP570

job owner	Pilot Travel Centers
engineer	MTG Engineers
contractor	Martin Marietta Materials Inc.
date of installation	April 2013

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

Pilot Travel Centers purchased a pre-existing service station at the corner of Interstate 30 and Highway 7 in Arkadelphia, Arkansas with the intention to demolish the existing structures and construct a Flying J truck stop. The Flying J service station caters to cross country 18 wheel transporters. Fully loaded transporters weigh up to 80,000 pounds gross weight. High volume traffic of fully loaded transporters creates a unique situation in a small area such as a truck stop. The pavement system endures tremendous stress and appropriate designs consist of heavy highway type pavement sections.

The pre-existing service station was also a truck stop and the pavement was extremely deteriorated and uneven from years of heavy traffic and an inadequate design. The geotechnical report indicated the presence of very soft soils in the upper 5 feet of the subsurface soil test borings, which needed to be accounted for in the design of the pavement section.

THE DESIGN

Pilot Travel Centers understood the importance of a well designed and constructed pavement section to support the heart of their business. The design engineers were tasked with designing a pavement section on very soft soils. The final design of the pavement section consisted of 2 inches of asphalt surface course, over 4 inches of asphalt binder course, over 10 inches of aggregate base course over either a lime stabilized subgrade or a reinforcing geosynthetic on the compacted subgrade. The

engineer left the decision up to the contractor to choose which alternate would be utilized for construction. The engineer was responsible for approving the proposed geosynthetic based on the reinforcing properties of the submitted product.

The contractor opted to utilize the geosynthetic alternate for construction of the project and submitted TenCate Mirafi® HP270, HP370, and HP570. Ultimately, after discussion with the engineer and consulting with TenCate engineers, Mirafi® HP570 woven geosynthetic was selected as the reinforcing geosynthetic. The very soft soils present at the subgrade surface elevation were planned to be dried and

compacted to 95 percent of maximum dry density for a corrected CBR design value of 3%. The TenCate engineers incorporated the project engineer's pavement thicknesses, the design subgrade CBR value of 3%, and the loading conditions from the planned vehicle traffic and incorporated the reinforcing properties of Mirafi® HP570 into the pavement system. Ultimately, Mirafi® HP570 was chosen to be the best product for construction of the geosynthetic reinforced flexible pavement.



Installation of Mirafi® HP570 geotextile.

THE CONSTRUCTION

The contractor chose the Mirafi® HP570 geosynthetic alternate over lime stabilizing the subgrade for several reasons. First, they felt they could get the required compaction of the subgrade to allow for placement of the cheaper geosynthetic alternate. Second, they felt like they could expedite the construction process by installing Mirafi® HP570 faster than it would take to lime stabilize the subgrade. Third, they were more comfortable utilizing Mirafi® HP570 in lieu of lime stabilization due to its superior reinforcing properties and also the separation capability of the woven geotextile, so that the aggregate base course does not migrate into the subgrade over time, mitigating premature failure of the roadway.

In late April, the contractor compacted the subgrade to 95 percent maximum dry density and installed Mirafi® HP570 on a relatively smooth subgrade. The Mirafi® HP570 was overlapped 2 feet at the edges of the rolls. The aggregate base course was installed on the fabric by end dumping the gravel over the geosynthetic, spreading the gravel and compacting. Vehicle traffic over the product was kept to a minimum until pavement construction was completed.

THE PERFORMANCE

The contractor and engineer were extremely satisfied with the design and use of Mirafi® HP570 for reinforcing the flexible pavement section. Pilot Travel Center understood that the investment made in constructing a well designed pavement section translates into much lower maintenance over time.



Installation of base course aggregate over Mirafi® HP570 geotextile.



Finished asphalt pavement section.

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