

Case Study

application Subgrade Improvement
location Owasso, OK
product Mirafi® HP570

job owner City of Owasso
engineer City of Owasso
contractor Austin Paving

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

The Lakes Subdivision in Owasso, Oklahoma was constructed in the early 1980's over an old creek bed. Moderate vehicle traffic on the Lakes Subdivision's streets over the last couple of decades has taken a toll on the concrete pavement. The many cracks and potholes that have developed through the years have lead to complete pavement failure in some areas. The City of Owasso decided to reconstruct 1800 lineal feet of the neighborhoods' streets in the summer of 2007.

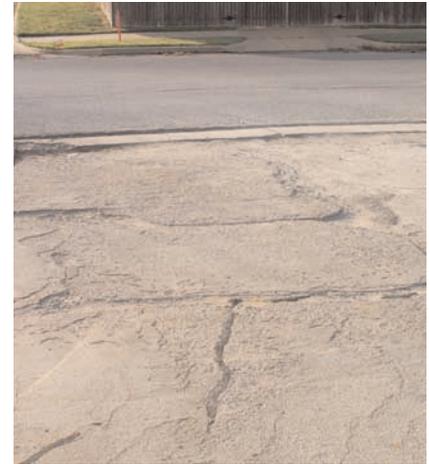
The City of Owasso knew that the pavement failures were a direct result of the weak silt soils supporting the existing pavement section. The existing pavement design consisted of 6 inches of reinforced concrete over 10 inches of base course aggregate. The City knew the existing design was not going to be adequate for the subgrade conditions and wanted to use alternative construction methods to stabilize the subgrade prior to construction of the new pavement section.

Excavating and replacing the existing silt soils with a higher quality fill material was considered, but due to the depth of these soils, was not considered a viable option. The City of Owasso contacted Maxwell Supply of Tulsa for an economical solution using a geosynthetic to assist in stabilizing the subgrade. The City decided that utilizing Mirafi® HP570 geosynthetic would be the most effective and economical option for their project.

THE DESIGN

The onsite soils primarily consist of highly unstable silts. The City engineers for the project were looking for a product that would stabilize the subgrade and provide a compacted "platform" on which the new pavement section could be constructed. The engineers were also looking for a product that would separate varying soil types as well as provide filtration and drainage characteristics.

The design of the new pavement section consists of 6 inches of reinforced concrete over 6 inches of compacted ODOT base course aggregate over a single layer of Mirafi® HP570 sewn panels across the subgrade. The City engineers required the panel sizes large enough to extend 10 feet into the driveways of each residence. In areas where there wasn't a driveway, the Mirafi® HP570 was wrapped back on top of the ODOT base course to assist in confinement of the aggregate and provide extra support of the curb and gutters.



Condition of pavement prior to removal.



Installation of Mirafi® HP570.

THE CONSTRUCTION

The contractor started the project by completely removing the existing pavement and underlying base course material, leaving the silt subgrade exposed. The Mirafi® HP570 sewn panels were then spread across the subgrade. The panels were prefabricated prior to delivery and measured 39 feet wide by 164 feet long. The contractor immediately placed and compacted the ODOT base course on the Mirafi® HP570.

The project was then delayed about 3 months, leaving the ODOT base course aggregate exposed. Routine residential traffic continued on the aggregate during this time period and no rutting or potholes developed. The contractor remobilized to the project and continued to construct the concrete pavement without having to repair any of the subgrade.

THE PERFORMANCE

Mirafi® HP570 provided the tensile strength, soil separation, filtration, and drainage necessary to stabilize and reinforce the harsh soil conditions encountered on the project site. There are no visible cracks and the pavement looks as good as new nearly 2 years since the completion of the project.



Installation of ODOT base course over Mirafi® HP570.



Mirafi® HP570 sewn panels.



Finished roadway (picture taken 05/09).

TenCate™ Geosynthetics North America assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. TenCate™ Geosynthetics North America disclaims any and all express, implied, or statutory standards, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, materials, or information furnished herewith. This document should not be construed as engineering advice.

Mirafi® is a registered trademark of Nicolon Corporation.

06.09