



Case Study

application Subgrade Stabilization - Railroad Spur
location Headrick, OK
product Mirafi® HP570

job owner Gavilon Grain Co.
engineer Terracon Consultants, Inc.
contractor Vigen Construction, 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

Gavilon Grain Company needed to construct a new grain elevator close to the City of Headrick, Oklahoma. They found a location about 2 miles west of the city limits of Headrick that was relatively close to Burlington Northern Santa Fe railroad, which runs east/west through the city. Gavilon worked with their engineers to design a railroad spur from the new grain elevator to the Burlington Northern Santa Fe main line. The 2 mile railroad spur crosses an open grassy field. The geotechnical engineer's soil test borings indicated deep silty sand soils with traces of clay. These soils tend to be highly unstable when exposed to the elements in combination with the loads from construction traffic.

The owner and engineer decided that excavating the undesirable soils and replacing them with a more stable fill or chemically stabilizing the soils would be too costly and time consuming. The engineer ultimately decided to use Mirafi® HP570 underlying the sub ballast to provide stabilization of the soils during construction and also to provide long term reinforcement for the life of the railroad spur.

THE DESIGN

The geotechnical design engineer considered several options to remediate the undesirable in-situ soils so that the railroad spur could be constructed to withstand the extreme loading conditions once the railroad spur was put in service. The engineer decided the most economical design was to use a geosynthetic product for this application. The engineer was looking for geosynthetic product that stabilizes the soils and reinforces the overall system. Ultimately,

the engineer decided Mirafi® HP570 was the product best suited for this project.

The design of the new railroad spur consisted of scarifying and recompacting the existing surficial soils and deploying Mirafi® HP570 on the existing subgrade. Approximately 9 inches of compacted sub ballast, containing some fines, is planned for the stabilizing fill material to support the railroad track system.

THE CONSTRUCTION

The contractor started the project by stripping the site of vegetation and scarifying the existing subgrade. Some compaction was achieved

during construction, but the contractor still had issues with the subgrade pumping under heavy construction traffic. Mirafi® HP570 was deployed on the subgrade with a 3 foot overlap after the ruts in the subgrade surface were regraded level. The sub-ballast was placed on top of the Mirafi® HP570 and compacted to 95 percent of the standard proctor density. The sub-ballast was proof-rolled upon completion of compaction and no deflection was observed. The sub-ballast section of the rail spur was utilized as a construction haul road for several months until construction of the grain elevator was completed.



Installation of Mirafi® HP570.



Installation of Mirafi® HP570.



Backfilling of sub ballast on Mirafi® HP570.

THE PERFORMANCE

The construction of the rail road spur was an overall success. The contractor was initially wary of using a geosynthetic under the sub ballast because they had little experience with using a product like Mirafi® HP570 in such an extreme environment but was used to chemically stabilizing soils in this situation. After completion of the project, the contractor was very satisfied with how simple and effective Mirafi® HP570 was to use in this application.



Completed sub ballast installation on Mirafi® HP570.

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