



## Case Study

**application** Subgrade Stabilization  
**location** Jefferson County, WI  
**product** Mirafi® H<sub>2</sub>Ri & BXG110

**job owner** Jefferson County Highway Department  
**engineer** Jefferson County Highway Department  
**date of installation** September 2013

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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

STH-106 was reconstructed over a marsh area approximately 3 years ago, and almost immediately began experiencing differential settlement issues. Jefferson County Highway Department desired a solution for reconstruction that would minimize the over excavation volume of the wet, organic soils and still provide a firm construction platform for the flexible pavement roadway. In addition, the construction platform would need to reduce differential settlement along the roadway route to maintain a roadway surface with acceptable rideability. Jefferson County Highway Department contacted Ero-Tex, TenCate Geosynthetics' distributor in Wisconsin for assistance.

### THE DESIGN

The primary challenge was the presence of wet and saturated silt and peat deposits to depths exceeding 30 feet below the existing pavement. Standard geotechnical practice calls for removing such deposits from beneath a pavement structure. However, this was not economically feasible. TenCate Geosynthetics performed an engineering analysis and developed a multi-layer geosynthetic reinforced aggregate sub-base option for the new roadway. The suggested section was comprised of a single layer of TenCate Mirafi® H<sub>2</sub>Ri\* wicking/reinforcing geosynthetic placed directly on the exposed subgrade, followed by a 15-inch lift of crushed stone, followed by a single layer of Mirafi® BXG110 biaxial geogrid, and finally a 15-inch lift of crushed stone. The Mirafi® H<sub>2</sub>Ri reinforced section provides a "raft" type platform for the roadway that reduces the amount of stress induced upon the subgrade by spreading the load over a broader area. This in turn reduces the overall settlement, and more impor-



Highway 106 after 5 years of use.



Depth and width of cracking on Highway 106 made for very poor rideability and dangerous conditions.

differential settlement along the roadway. In addition, Mirafi® H<sub>2</sub>Ri wicking/reinforcing geosynthetic was chosen due to the wet conditions of the area. Mirafi® H<sub>2</sub>Ri will help facilitate removing water from beneath the pavement roadbed, especially during spring thaw and heavy rain events.

**THE CONSTRUCTION**

The Jefferson County Highway Department performed the installation. Based on the design, only a 30-inch undercut was required. To minimize waste, Mirafi® H<sub>2</sub>Ri seams were sewn in the field as opposed to overlapping. Mirafi® H<sub>2</sub>Ri was deployed directly upon the exposed subgrade and the crushed stone was then dumped and spread with a bulldozer. Following compaction, a single layer of Mirafi® BXG110 biaxial geogrid was deployed directly on the 15-inch crushed stone layer. Adjoining sections of Mirafi® BXG110 were overlapped a minimum of 12 inches and a 15-inch layer of crushed stone was dumped and spread with a bulldozer, then compacted. Subsequently, the pavement aggregate base course was installed, followed by the asphalt flexible pavement.

**THE PERFORMANCE**

Jefferson County Highway Department was pleased with the installation process. The multi-layer geosynthetic reinforced section provided a firm, non-yielding platform that enabled the paving operations to proceed. Because of the TenCate design, subgrade undercutting was minimized to 30 inches, compared to a potential 5-8 feet undercut (or more) for the soil conditions present. In addition to the cost savings there was also a substantial time savings in the project construction schedule.



Loader adding first lift of aggregate on Mirafi® H<sub>2</sub>Ri.



Bulldozer spreading the aggregate.

\*Patented

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