

Attack the Threat

case study Combating Moisture Settlement in Wisconsin

PRODUCT APPLICATION LOCATION Mirafi[®] H₂R*i* and BXG110 Subgrade Stabilization Jefferson City, WI











THE CHALLENGE

Roadway reconstruction over marshland in Wisconsin.

Wisconsin Highway 106 (STH-106) was reconstructed over a marsh area approximately 3 years prior, and almost immediately began experiencing differential settlement issues. Jefferson County Highway Department desired a rapid 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 be robust enough to reduce differential settlement along the roadway route to maintain a roadway surface with acceptable rideability.





JOB OWNER Jefferson County Highway Department ENGINEER Jefferson County Highway Department DATE OF INSTALLATION September 2013



THE DESIGN

The primary challenge was the presence of wet, saturated silt and peat deposits to depths exceeding 30 feet below the existing pavement. A multilayer geosynthetic reinforced aggregate sub-base option was developed for the new roadway. The robust section was comprised of a single layer of TenCate Mirafi[®] H₂Ri geosynthetic placed directly on the exposed subgrade, followed by a 15-inch lift of crushed stone, as well as a single layer of Mirafi[®] BXG110 biaxial geogrid, and finally a 15-inch lift of crushed stone. The redundancy of reinforcement and moisture management in the Mirafi[®] H₂Ri reinforced section provides a "raft" type platform for the roadway, thus improving the rapidity at which water is removed from beneath the pavement system, especially during spring thaw and heavy rain events.





THE CONSTRUCTION

The Jefferson County Highway Department performed the installation, and based on the design, only a 30-inch undercut was required. To minimize waste, Mirafi[®] H₂Ri seams were sewn in the field as opposed to overlapping. Mirafi[®] H₂Ri was deployed directly upon the exposed subgrade, and the robustness of Mirafi[®] H₂Ri allowed for the crushed stone to be installed directly on the geotextile. A single layer of Mirafi[®] BXG110 biaxial geogrid was then placed 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 resourcefulness of the multilayer geosynthetic reinforced section provided a firm, non-yielding platform that enabled the paving operations to proceed. Because of the robustness of the system, subgrade undercutting was minimized to 30 inches, compared to a potential 5-8 foot undercut (or more) for the soil conditions present. In addition to the cost savings there was also a substantial time savings in the rapidity of the project construction schedule; overall, a very positive impact on project sustainability.





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