

**Research Type:** Full Scale Laboratory Cyclic Box  
Unpaved Road/Subgrade Stabilization

**Research Entity:** GeoTesting Express, Alpharetta, GA

**Products Tested:** Mirafi® RS380i  
Mirafi® RS580i  
Mirafi® H<sub>2</sub>Ri

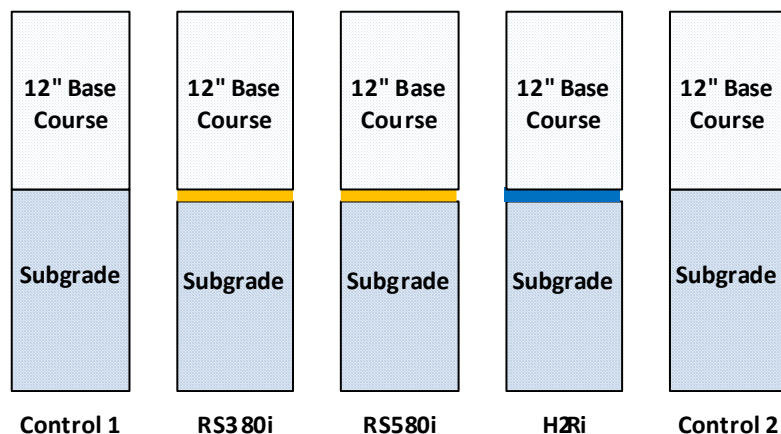
**Test Parameters:** Subgrade Soil CBR 1.0% Georgia Piedmont Silt  
Dense Graded Aggregate Base Course

**Research Purpose:** Testing was performed by GeoTesting Express in Alpharetta, GA in the large cyclic box located in their laboratory to determine the performance characteristics of TenCate Mirafi® RS380i, RS580i and H<sub>2</sub>Ri in soft subgrade soil conditions.



**Procedure:** Test sections were constructed in a 6.5' (2 m) X 6.5' (2 m) X 5' (1.5 m) deep test box as, shown above. A steel plate measuring 12" (300 mm) in diameter was placed on a rubber pad to simulate wheel loads that provide a more uniform contact pressure on the test section surface. The applied loads and load frequency simulate a 9 kip wheel load or an 18 kip axle load. The maximum applied load applied by the steel plate was 8.2 kips (36 kN), resulting in a pressure of 72.5 psi (500 kPa). Five separate test sections were built in the box. The first and last were control sections with 12" (300 mm) of compacted aggregate and had no geosynthetic reinforcement. The other three sections were individually reinforced with either Mirafi® RS380i, RS580i or H<sub>2</sub>Ri and each also contained 12" (300mm) of compacted base course aggregate.

## Test Sections



**Results:** Measurements were taken to determine the amount of cycles that were needed to reach pre-determined rut depths. The Corp of Engineers method for stabilization analysis that removes the initial load cycles to take into consideration the effect of construction traffic was utilized for the results. All three of the geosynthetic reinforced test sections significantly outperformed the control tests sections. Mirafi<sup>®</sup> H<sub>2</sub>Ri exhibited the best performance and was followed by Mirafi<sup>®</sup> RS580i and RS380i, respectively.

Number of Cycles			
Section	1" (25 mm) Rut Depth	3" (75 mm) Rut Depth	4" (100 mm) Rut Depth
Average Control	11	54	65
Mirafi <sup>®</sup> RS380i	24	282	647
Mirafi <sup>®</sup> RS580i	24	406	1320
Mirafi <sup>®</sup> H <sub>2</sub> Ri	30	426	1506

**Conclusions:** Past research has demonstrated that geosynthetics containing the combination of high tensile modulus, high permittivity, high coefficient of interaction and the ability to provide separation of the subgrade from the base aggregate, will result in superior performance in roadway reinforcement applications. All three of the Mirafi<sup>®</sup> geosynthetics tested are designed to maximize these key characteristics. The Mirafi<sup>®</sup> RS580i has a higher modulus and coefficient of interaction than the Mirafi<sup>®</sup> RS380i, therefore, providing better roadway performance. Mirafi<sup>®</sup> H<sub>2</sub>Ri, however, showed the best performance although the modulus and permittivity are not as high as Mirafi<sup>®</sup> RS580i. The superior performance of Mirafi<sup>®</sup> H<sub>2</sub>Ri can be attributed to the wicking yarns that wick excess moisture out of the subgrade and base course, thereby strengthening those layers.