

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

Research Entity: GeoTesting Express, Alpharetta, GA

Products Tested: Mirafi® RS380i
Mirafi® HP570

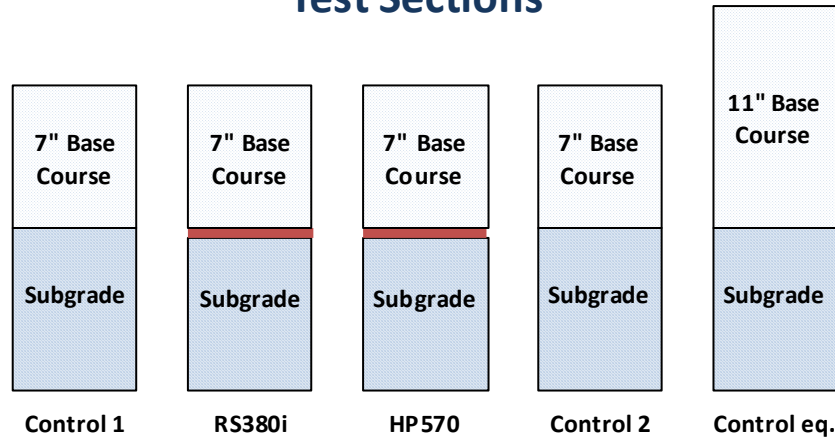
Test Parameters: Subgrade Soil CBR 2.0% Georgia Piedmont Silt
Dense Graded Aggregate Base Course

Research Purpose: Testing was set up at GeoTesting express in Alpharetta, GA in the large cyclic box located in their laboratory to determine the performance characteristics of TenCate Mirafi® RS380i and HP570.



Procedure: Test sections were constructed in a 6.5' (2 m) X 6.5' (2 m) X 5 ft (1.5 m) deep test box as shown above. A steel plate measuring 12" (300 mm) in diameter was used to provide a uniform pressure directly on the test sections to simulate an 18 kip axle load or 9 kip wheel 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. Two were control sections with 7" (175 mm) of compacted aggregate and no geosynthetic reinforcement and two were sections with the same 7" (175 mm) of compacted aggregate but also included geosynthetic reinforcement with Mirafi® RS380i and HP570, respectively. A final section with an increased aggregate section of 11" (275 mm) and no geosynthetic reinforcement was also installed to compare the geosynthetic reinforced sections to thicker unreinforced sections.

Test Sections



Results: Measurements were taken to determine the amount of cycles that were needed to reach pre-determined rut depths. TenCate Mirafi® RS380i outperformed the other tests sections including the control section with four added inches of aggregate.

Section	Number of Cycles		
	1" (25 mm)	2" (50 mm)	3" (75 mm)
	Rut Depth	Rut Depth	Rut Depth
Control	1.6	4.0	6.9
Mirafi® RS380i	6.8	87	866
Mirafi® HP570	1.9	16	178
Control	1.4	6.9	19
Average Control	1.5	3.8	6.9
Control 11" Aggregate	4.4	41	735

Conclusions: Past research has shown that geosynthetics which have a high tensile modulus, high permittivity, a high coefficient of interaction and have the ability to provide separation, will result in superior performance in roadway reinforcement applications. Mirafi® RS380i is an engineered geosynthetic designed to maximize all four of these key characteristics. Although Mirafi® HP570 has a slightly higher tensile modulus, Mirafi® RS380i outperforms Mirafi® HP570 due to the ability to better separate the subgrade from the base aggregate, higher permittivity and higher coefficient of interaction. In addition, Mirafi® RS380i outperformed the control section that included an additional 4 inches (100 mm) of aggregate demonstrating the superior value proposal of Mirafi® RS380i section vs. all the other sections in terms of both short term and long term costs.