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CASE HISTORY

TENAX TENDRAIN high flow triplanar geocomposites for roadway subsurface drainage, US Route 1, Maine DOT

TENAX TENDRAIN high flow
triplanar geocomposites
Madawaska, Maine, October 2001
Maine Dept. of Transportation
Pelletier & Sons, Inc.
Mr. Scott Hayden, Maine DOT



PROBLEM

The Maine Department of Transportation Madawaska highway reconstruction project is located in extreme northern Maine along the US and Canadian border. The project consists of a 1.8 km portion of urban roadway with sidewalks and closed drainage on each side of the highway. The existing pavement condition is poor with frequent traverse cracks, potholes and extensive alligator cracking.

Existing soil conditions consist of alluvial deposits, with frequent alternating layers of silty sandy gravel. The dominant subgrade soil type has an AASHTO classification of A-4 with 36-79% fines passing the #200 sieve. Surface and subsurface drainage is a major consideration for Maine DOT and the Town of Madawaska. Premature pavement failure on US Route 1 has been attributed to poor subgrade soil drainage, breakdown of the aggregate base, and the migration of fines. These problems are common and Maine DOT is actively researching affordable solutions. The original design called for a 0.76 m pavement section consisting of 150 mm of asphalt and 610 mm of base gravel.

SOLUTION

However, because of the unavailability of good quality low cost aggregate, a new design was considered: a design that could utilize the existing subgrade soils with its poor drainage capabilities. The new design incorporated a lateral roadway geocomposite underdrain system: TENAX TENDRAIN. This design is based upon the positive research data from an experimental highway project, Frankfort-Winterport Highway, currently being monitored by Maine DOT.

TENAX TENDRAIN is placed directly beneath the pavement base to collect any infiltration before water enters the subbase. TENAX TENDRAIN provides rapid water removal.



TENAX TENDRAIN drainage layer

CONCLUSIONS

By incorporating the TENAX TENDRAIN geocomposite drainage layer between the aggregate base member and the silty subgrade soils an excellent drainage path was created. TENAX TENDRAIN also dramatically shortened the drainage path, reducing time to drain from months to less than a day. In addition, the drainage geocomposite also provides separation and strength to the pavement section. After reviewing their design using TENAX TENDRAIN, Maine DOT determined that the base aggregate thickness of 610 mm could be reduced to 305 mm while still maintaining the same roadway service life.