



MaineDOT

Transportation Research Division



Final Report 01-3

Experimental Installation of Geosynthetic Pavement
Reinforcement to Reduce Reflective Cracking.

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Experimental Installation of Geosynthetic Pavement Reinforcement to Reduce Reflective Cracking.

Introduction

In October of 2000 the MaineDOT experimented with the use of a geosynthetic pavement reinforcement fabric on runway 17-35 of the Auburn-Lewiston Municipal Airport. The goal of the experiment was to determine the effectiveness of the fabric in reducing reflective cracking of the HMA overlay.

Reflective cracking is the propagation of existing cracks from the older pavement layer into the overlay. Reflective cracking is caused by increased shear and tensile stresses in the overlay induced by movements in the underlying pavement. Geosynthetic fabric is placed over a crack to better distribute these increased shear and tensile stresses. Reducing these stresses hopefully prevents the propagation of existing cracks into the overlay.

The geosynthetic fabric was placed over individual cracks in a “band-aid” style. This “band-aid” style was used rather than a full width layer of fabric, covering the entire runway, for cost reasons. After the fabric was applied the runway was then paved with 40 mm of HMA.

Numerous construction issues were noted in the initial construction report completed in February of 2001. There were problems with fabric adhesion to the existing runway. In some areas the sealant receded into the crack leaving the covering fabric unsupported. And there were difficulties with paving over areas of overbanding. As a result of these construction issues the initial report noted that the effectiveness of this test will be somewhat compromised.

For more information regarding the construction of this project see MaineDOT experimental construction report 01-3.

Results

A visual inspection was performed in June of 2005. There is significant cracking in both the test and control sections of runway 17-35. According to the airport manager the runway had been crack sealed in 2003 and was scheduled for a crack seal later this month. After examining photos taken in 2000 as well as the ARAN video from 2000, it appears much of the cracking is reflective. However a formal comparison of the 2000 ARAN video data to more recent ARAN video data using Wisecracks has not been performed.

Conclusions

The use of geosynthetic pavement reinforcement fabric on runway 17-35 did not prevent or significantly reduce reflective cracking into the 40 mm overlay placed in 2000. However the construction report raises serious concerns regarding the installation of the geosynthetic fabric. Inadequate adhesion of the fabric to the runway, overbanding of the crack sealant and subsequent paving difficulties caused by overbanding all may have contributed to the poor performance. Given these concerns no conclusions can be reached regarding the effectiveness of this product.

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