

**Structural improvements of flexible pavements using geosynthetics for base
course reinforcement
Quarterly Progress Report**

July – September 2008

Next report due: January 31, 2009 (for period October to December 2008)

ACCOMPLISHMENTS DURING THE QUARTER:

ERDC-CRREL:

Traffic testing on Test Section 7 (6 in. asphalt, 24 in. base, geogrid reinforced) was completed on 2 July 2008. The average cumulative rut depth after 464,000 passes of the HVS was 7.7 mm (Figure 1). Final instrumentation readings and falling weight testing were conducted at the conclusion of trafficking. This concludes traffic testing for all of the test windows.

Final plans were made with the University of Maine to conduct the forensics investigation. The project partners from the University of Maine traveled to ERDC-CRREL to perform the forensics work from 30 July to 1 August 2008.

The previously developed protocol was followed for the forensics evaluation. Based on the locations of the surviving geogrid strain gages, measurements were collected in Test Sections 7 and 8. Readings were collected as each layer of overlying material was removed.

Measurements of the Emu strain gages were collected in Test Sections 1 – 4, or a total of four sets of measurements. While initially two sets of readings were proposed, the two additional sets provide vertical and horizontal measurements in similar test sections with and without geogrid reinforcement. To access the Emu sensors, trenches were cut to the side of each stack of strain gages and excavated to a depth of 3 feet (Figure 2a). The side wall was hand excavated to expose the Emu gage locations (Figure 2b) and allow access to make vertical and horizontal measurements between the gages.

During the forensics investigation, the base course and subgrade layers were characterized to determine the soil density and soil moisture content values.

A Technical Panel Meeting web meeting was held on 16 September 2008 to update the project members on the project progress. ERDC-CRREL and U. Maine provided updates on progress to the panel. A draft report will be forwarded to Mr. Dale Peabody, Maine DOT, by Friday, 7 November. The draft report will be made available for review to all of the members of the Technical Panel.

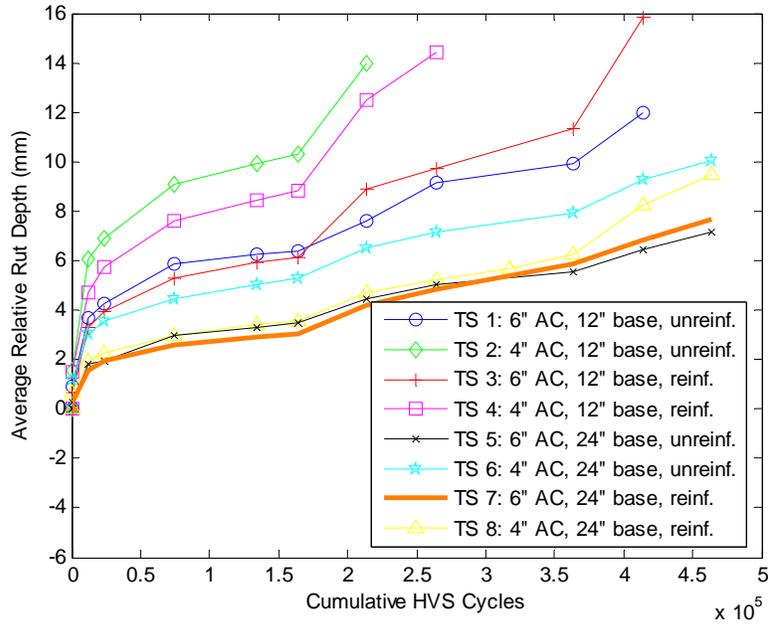


Figure 1: Average rut depth comparison of Test Section 7 after 464,000 passes and all completed test sections.



a.



b.

Figure 2. During the forensics activities a) soil excavation in trench; b) hand excavation of Emu coils for measuring the vertical and horizontal distances between sensors.

PROPOSED ACTIVITIES:

1. Complete the analysis of the forensics data collected;
2. Complete the final data analysis;
3. Prepare a draft final project report, in collaboration with the University of Maine.

UNIVERSITY OF MAINE:

The final sets of data from Test Section 7 were received and analyzed, which completed the data reduction process for the trafficking data.

Plans were finalized for the forensics investigation together with ERDC-CRREL. William Davids and Joshua Clapp from the University of Maine were present to help conduct the forensics investigation. The University of Maine focused on measuring geogrid strains and Emu coil distances. All of the goals in the forensics plan were met and additional data was collected beyond the scope of the plan. Data collected during the forensics work was reduced and analyzed.

A summary of the project results and forensics work was presented at the Technical Panel Meeting held on 16 September 2008. The results compiled for this presentation also form the basis of the draft final project report.

PROPOSED ACTIVITIES:

1. Continue to analyze the collected data and generate results
2. Fine-tune the rutting models using data from all sections
3. Cooperatively draft the final project report, submit to reviewers, and integrate comments from reviewers

UNRESOLVED OR NOTABLE ISSUES:

1. None

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PURPOSE AND SCOPE:

This study will provide missing data required to help determine whether geosynthetic reinforcement is beneficial at conditions typically experienced in state highway construction. If the geogrid does provide benefit, the study will develop an AASHTO specification for geosynthetic reinforcement of the aggregate base course of flexible pavement structures. Furthermore, the results will be published in a format to conform with future modifications to the AASHTO Pavement Design Guide.

The objectives of this study are:

1. To determine whether and under what conditions geosynthetics (geogrids and geotextiles) increase the structural capacity of pavements typically constructed by state DOTs.
2. To determine whether and under what conditions geosynthetics increase the service life of pavements typically constructed by state DOTs.
3. To measure in-situ stress/strain response of the reinforced material for use in current or future pavement design processes.