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

January – March 2008
Next report due: July 31, 2008 (for period April to June 2008)

ACCOMPLISHMENTS DURING THE QUARTER:

ERDC-CRREL:

Testing on Section 8 (4 in asphalt, 24 in base, grid) resumed toward the end of January and was completed following repairs to the HVS. The resulting average rut depth after 464,000 passes was less than 10 mm (Figure 1). FWD testing and analysis was conducted at the completion of trafficking on the designated locations on all test windows. The HVS was positioned over Test Section 5 (6 in. asphalt, 24 in base, no grid) and the average rut depth after 414,000 passes has been determined (Figure 1). At the target pass level of 464,000 passes, final readings will be collected and FWD testing will be done.

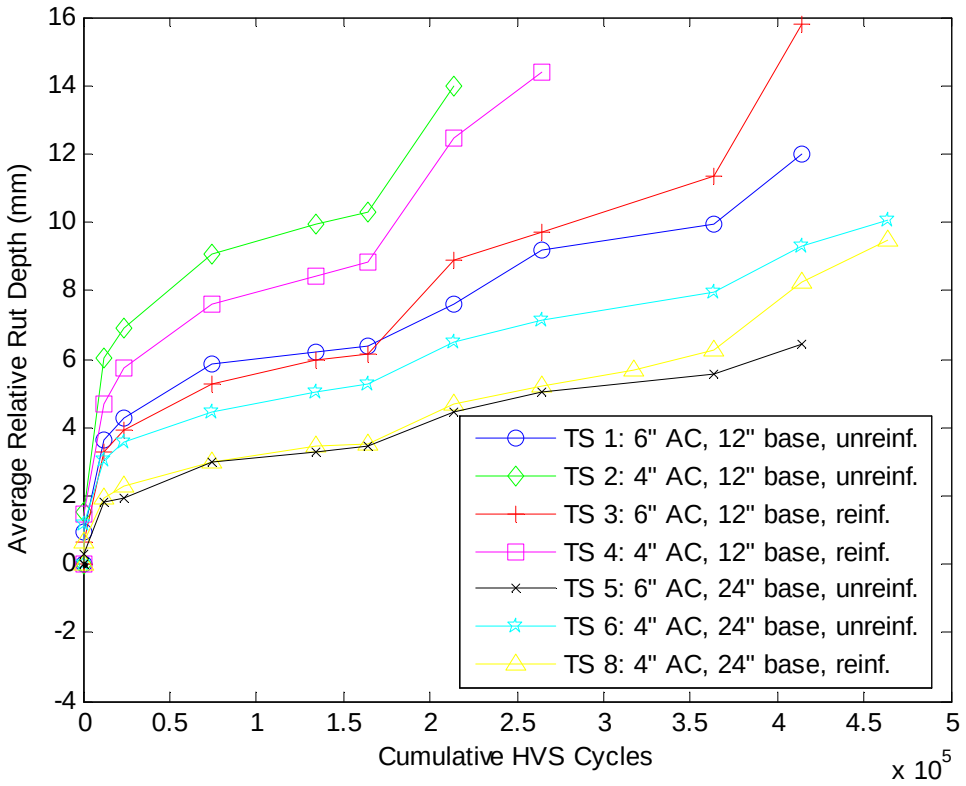

Figure 1: Rut Depths after 464k and 414k passes in Test Sections 8 and 5, respectively.

PROPOSED ACTIVITIES:

1. Complete trafficking of Test Section 5.
2. Conduct FWD testing of Test Section 5 after failure.

UNIVERSITY OF MAINE:

Data collected at the interval test points has been received and processed using the protocols previously developed. No timed strain data was collected during the period between 9 December 2007 and 25 January 2008, which coincides with the time period when the HVS was down awaiting repair. This data is used to estimate permanent (unloaded) strain in the geogrid that primarily develops as traffic cycles are applied.

Permanent deformation models developed by Clapp (2007) were re-calibrated using individual material layer deformation data from Test Sections 1-4. These are the only sections that had 100% survivability for the instrumentation that measured permanent vertical deformations. Using these permanent deformation models, the rut depths in Test Sections 6 and 8 were able to be predicted reasonably well. Additional refinement may be necessary when data from Test Sections 5 and 7 is collected.

PROPOSED ACTIVITIES:

1. Continue to monitor data being generated by CRREL
2. Cooperatively develop/modify static testing protocols based on instrumentation survivability

UNRESOLVED OR NOTABLE ISSUES:

1. Additional funding, now available at FHWA, has not been received by either CRREL or University of Maine. ***This funding should be received very soon in order to continue work without any further delays in the project.*** This remains a critical issue that requires immediate resolution to ensure further testing delays are not encountered.
2. Some geogrid strain gages have failed. requiring some changes in the static load test protocol in order to obtain the best data possible for modeling purposes.

Respectfully submitted:

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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.