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

October 2005 – December 2005
Next report due: March 31, 2005

ACCOMPLISHMENTS DURING THE QUARTER:

ERDC-CRREL:

We began the process of weakening the subgrade prior to testing by cutting trenches in the sides of the test section, installing monitoring wells in the center of the test section (to a depth of 2 inches into the subgrade), and conducting FWD tests on the test sections to perform back-calculated estimates of the subgrade resilient modulus. We began applying water 2-3 times per week while monitoring water levels in the wells and volumetric soil moisture sensors.

Trench cut for adding water can be seen on the left side of the asphalt.

UNIVERSITY OF MAINE:

We have completed the FE mesh density and geometric studies. The level of mesh refinement and FE model dimensions have been established to ensure convergence while retaining reasonable solution times. The FE mesh generator has been extended to include the effect of varying asphalt thickness in adjacent testing windows at the CRREL facility.

The protocol for laboratory geogrid creep testing has been established based on ASTM D4595. The first phase of long-term laboratory creep tests has begun. The anticipated load in the geogrid was determined from field data and FE model results. Testing load levels bound the anticipated value, which also allows examination of stress-dependent creep effects.

PROPOSED ACTIVITIES:

ERDC-CRREL:

1. Continue conducting FWD testing periodically of the test section to determine the subgrade modulus values.
2. Continue adding water to the test section and monitor water levels and soil water content.
3. When desired subgrade modulus is reached (i.e. 5,000 psi), stop adding water and begin trafficking with HVS.

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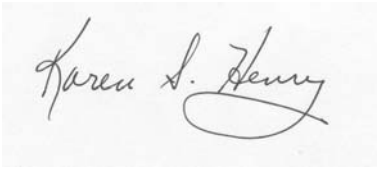
1. Continue conducting long-term laboratory geogrid creep tests at different load levels.
2. Begin preparing for live-load field testing of geogrid reinforced road sections at the Litchfield-Monmouth site. This field data will be used to calibrate the FE model and will compliment the laboratory data from CRREL.

UNRESOLVED OR NOTABLE ISSUES:

None at this time. We expect to be able to start testing with the Heavy Vehicle Simulator in February 2006.

Respectfully submitted:



Karen S. Henry, Ph.D., P.E.
Research Civil Engineer
U.S. Army Engineer Research and Development Center
Cold Regions Research and Engineering Laboratory
Hanover, NH 03755-1290

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.