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

January – March 2006
Next report due: June 30, 2006

ACCOMPLISHMENTS DURING THE QUARTER:

ERDC-CRREL:

We continued the process of weakening the subgrade prior to testing by adding water to the trenches in the asphalt on the sides of the test section, and conducting FWD tests to perform back-calculated estimates of the subgrade resilient modulus. We began applied water 2-3 times per week while monitoring water levels in the wells and volumetric soil moisture sensors. The monitoring wells in the center of the test section (to a depth of 2 inches into the subgrade) indicate no ponding of water in the base. The fwd testing indicates that the rate of decrease in resilient modulus of the subgrade is slowing, and that we have decreased the resilient modulus to approximately 50-60% of its constructed values.

UNIVERSITY OF MAINE:

We have completed the first long-term laboratory creep test at the lower load level. A simple creep model in ABAQUS was chosen for the geogrid. The stresses in the geogrid specimen are a function of position and time, which adds complexity to the calibration process. The end result is a finite element creep model that corresponds very well to the measured laboratory response.

A protocol was developed for conducting live-load field testing of geogrid-reinforced road sections at the Litchfield-Monmouth site. All necessary equipment was located and tested. The Benkelman Beam apparatus was modified so that it can measure vertical deformations at 4 points in the deflection basin.

PROPOSED ACTIVITIES:

ERDC-CRREL:

1. Coordinate with University of Maine, and begin testing and trafficking the test section.

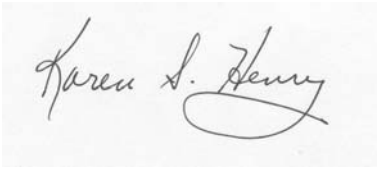
UNIVERSITY OF MAINE:

1. Begin conducting the second long-term laboratory creep test at higher load level.
2. Perform live-load field testing at Litchfield-Monmouth site.
3. Develop static load testing protocol for CRREL test sections.
4. Oversee the first static load tests and the beginning of trafficking at CRREL.
5. Analyze lab data as it is collected. Modify the trafficking procedure as necessary.

UNRESOLVED OR NOTABLE ISSUES:

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

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.