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

April – June 2006
Next report due: September 30, 2006

ACCOMPLISHMENTS DURING THE QUARTER:

ERDC-CRREL:

Heavy vehicle simulation testing of the paved test sections has begun. The first test section trafficked, Test Section 2, was about 90% failed as of 30 June 2006. Initial static load tests on test sections 2 & 4 (without and with grid, respectively) were performed on May 17th. Strain gages on the grid were read and recorded for these tests and deformation of the soil layers, as documented by emu coils, were also noted and recorded. We are sharing the HVS between two pooled-fund projects, and chose to test the two 'weakest' test sections first because of the need to have testing completed by the end of July. Test sections 2 and 4 comprise 4 inches of asphalt and 12 inches of base. Test section 2 does not have a grid between the base and subgrade, test section 4 does have a grid.

FWD tests were performed before and were planned to be performed immediately after loading, test section 2. Water contents of the test sections continue to be monitored.

UNIVERSITY OF MAINE:

The second long-term laboratory creep test was started. The magnitude of the tensile load was increased to examine the stress-dependency of creep in the geogrid material.

FWD and surface deflection data was collected at the Litchfield-Monmouth site on April 27th. Static tests were performed with a loaded dump truck at locations with instrumented geogrid as well as control sections.

The HVS static load testing protocol was developed in cooperation with CRREL to facilitate data collection while satisfying feasibility constraints. A package of data reduction routines was developed to analyze the different types of test data, which allows the user to quickly assess pavement distress and modify the trafficking procedure as necessary.

PROPOSED ACTIVITIES:

ERDC-CRREL:

1. Continue to coordinate with the University of Maine and complete testing of Test Sections 2 and 4, providing the appropriate data to the University of Maine.
2. Wire strain gages to datalogger for reading periodically DURING trafficking with the heavy vehicle simulator.

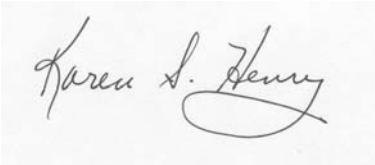
UNIVERSITY OF MAINE:

1. Continue to monitor CRREL test data as it becomes available. Make changes to the trafficking procedure as necessary such that rutting failure occurs within the available time window.
2. Calibrate the finite element model using data from Test section 2 to determine in-situ material properties. Extend the calibration process to the Test section 4 to determine the reinforcing properties of the geogrid.

UNRESOLVED OR NOTABLE ISSUES:

There were several issues related to repair of the heavy vehicle simulator during June, 2006. Most notable was the discovery of an oil leak immediately upon initiation of trafficking. This eventually led to having the HVS be out of commission from 31 May 06 until 16 June 06. However, we did resume testing with few difficulties after that time.

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.