

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: *July 15, 2013*

Lead Agency: *Montana Department of Transportation*

**INSTRUCTIONS:**

*Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.*

<b>Transportation Pooled Fund Program Project #:</b>  <i>TPF-5(251)</i>	<b>Transportation Pooled Fund Program – Report Period:</b>  <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input checked="" type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
<b>Project Title:</b> <i>Relative Operational Performance of Geosynthetics Used as Subgrade Stabilization</i>		
<b>Name of Project Managers:</b> <i>Eli Cuelho</i> <i>Steven Perkins</i>	<b>Phone Numbers:</b> <i>(406) 994-7886</i> <i>(406) 994-6119</i>	<b>E-Mails</b> <a href="mailto:elic@coe.montana.edu"><i>elic@coe.montana.edu</i></a> <a href="mailto:stevep@ce.montana.edu"><i>stevep@ce.montana.edu</i></a>
<b>Lead Agency Project ID:</b> <i>MDT Project #7712</i>	<b>Other Project ID:</b> <i>MSU/OSP: 4W3850</i>	<b>Project Start Date:</b> <i>December 1, 2011</i>
<b>Original Project End Date:</b> <i>November 30, 2013</i>	<b>Current Project End Date:</b> <i>November 30, 2013</i>	<b>Number of Extensions:</b> <i>0</i>

**Project schedule status:**

On schedule     
  On revised schedule     
  Ahead of schedule     
  Behind schedule

**Overall Project Statistics:**

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
<i>\$573,476</i>	<i>\$493,245</i>	<i>78%</i>

**Quarterly Project Statistics:**

Total Project Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
<i>15%</i>	<i>\$83,578</i>	<i>79%</i>

## **Project Description:**

*State departments of transportation (DOTs) routinely use geosynthetics for subgrade stabilization. This construction practice involves placing an appropriately specified geosynthetic on a weak subgrade prior to placement of roadway subbase. The geosynthetic provides stabilization of the subgrade by increasing the load-carrying capacity of the system and maintaining separation between the soft subgrade and subbase materials. Subgrade stabilization allows for a firm construction platform to be built with less aggregate and less construction time as compared to construction without the stabilization geosynthetic. There is a general consensus concerning the effectiveness of geosynthetics in this application; however, there is a lack of understanding and agreement on the material's properties needed for performance. Those properties should be specified in order to ensure its beneficial use and to allow a broad range of products to be considered. In order to provide for the most economical geosynthetic selection while minimizing conflicts and promoting competitiveness, MDT and other states are conducting a study to examine the performance of various geosynthetics for subgrade stabilization. The aim of the study is to relate this performance to material properties that can be incorporated into standard specifications to allow for broad and economical use of geosynthetic products for a specific application.*

## **Progress this quarter:**

### **Task 1 – Material Characterization**

- *sent geosynthetic samples to independent testing lab for junction strength, aperture stability and grab tensile tests*
- *conducted controlled laboratory testing of geosynthetics instrumented with strain gages*

### **Task 2 – Setup Monitoring Equipment – COMPLETED**

### **Task 3 – Planning and Construction – COMPLETED**

### **Task 4 – Install Instrumentation – COMPLETED**

### **Task 5 – Trafficking and Data Collection – COMPLETED**

### **Task 6 – Forensic Investigations**

- *remaining forensics work will be conducted during the week of July 8<sup>th</sup>*

### **Task 7 – Data Analysis**

- *organization and analyses of pore-water pressure, displacement, strain and rut data continued during this quarter*

### **Task 8 – Reporting**

- *Progress Report #6 was written*

## **Anticipated work next quarter:**

### **Task 1 – Material Characterization**

- *synthesize results from all material tests*

### **Task 2 – Setup Monitoring Equipment – COMPLETED**

### **Task 3 – Planning and Construction – COMPLETED**

### **Task 4 – Install Instrumentation – COMPLETED**

### **Task 5 – Trafficking and Data Collection – COMPLETED**

### **Task 6 – Forensic Investigations**

- *conduct forensic investigations*
  - *collection of subgrade samples to assess moisture content*
  - *collection of base course samples to assess subgrade migration*
  - *conduct DCP and LWD tests on subgrade*
  - *topographic survey of transverse rut in a single location in each test section*
  - *removal of geosynthetic samples for damage assessment*
- *conduct full damage assessment of geosynthetics*

### **Task 7 – Data Analysis**

- *continue analysis of pore-water pressure, displacement, strain, and rut data*

### **Task 8 – Reporting**

- *submit Task Report #3 (Material Characterization) by July 31*
- *submit Task Report #4 (Post-Trafficking Forensic Investigations) by August 30*
- *submit draft Final Report by September 30*

## **Significant Results:**

*There are no significant results to be presented at this time.*

## **Circumstances Affecting Project or Budget:**

- *Material characterization tests on the geosynthetics are not complete. The task report associated with this work cannot be written until this work is finished. It is anticipated that the task report will be approximately 2 months later than what is scheduled (anticipated delivery date is July 31, 2013).*
- *Winter weather prevented full forensic investigations after trafficking. Remaining forensic work is scheduled to resume in July, and the associated task report will be submitted by August 30, 2013.*

## **Potential Implementation:**

*It is anticipated that the information from this project will be useful to departments of transportation seeking to improve their specification of and use of geosynthetics for subgrade stabilization.*