

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: *July 10, 2012*

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.

Transportation Pooled Fund Program Project #: <i>TPF-5(251)</i>	Transportation Pooled Fund Program – Report Period: <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)	
Project Title: <i>Relative Operational Performance of Geosynthetics Used as Subgrade Stabilization</i>		
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Lead Agency Project ID: <i>MDT Project #7712</i>	Other Project ID: <i>MSU/OSP: 4W3850</i>	Project Start Date: <i>December 1, 2011</i>
Original Project End Date: <i>November 30, 2013</i>	Current Project End Date: <i>November 30, 2013</i>	Number of Extensions: <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>\$581,726</i>	<i>\$161,977</i>	<i>20%</i>

Quarterly Project Statistics:

Total Project Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
<i>20%</i>	<i>\$119,177</i>	<i>29%</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

- *continued laboratory tests to establish CBR–vane shear correlation for subgrade soil*
- *determined base course aggregate source (Wyndham pit near Lewistown, MT)*
- *conducted CBR tests on base course aggregate*
- *purchased in-field CBR testing equipment*
- *obtained remaining six geosynthetics and documented roll and lot information for all geosynthetics*
- *reviewed cyclic plate load test results conducted by GeoTesting Express*

Task 2 – Setup Monitoring Equipment

- *bid and purchased a robotic total station for rut measurements in the field*
- *made data collection notebooks for vane shear*
- *tested DCP and LWD devices*
- *purchased instrumentation wire*
- *determined wire and data acquisition (DAQ) layout*
- *calibrated LVDTs*
- *tested pore water pressure sensors in water and soil under static and dynamic loads in the lab*
- *built and tested strain gage circuitry*
- *estimated power requirements and planned layout of power system for DAQ*

Task 3 – Planning and Construction

- *bid and awarded construction contract*
- *purchased subgrade soil; delivery began in June and will continue into July*

Task 4 – Install Instrumentation – *no progress on this task during this period*

Task 5 – Trafficking and Data Collection – *no progress on this task during this period*

Task 6 – Forensic Investigations – *no progress on this task during this period*

Task 7 – Data Analysis – *no progress on this task during this period*

Task 8 – Reporting

- *Progress Report #3 was written*

Anticipated work next quarter:

Task 1 – Material Characterization

- *additional laboratory tests of delivered subgrade soil to finalize CBR–vane shear correlation*
- *geosynthetics testing (when time permits around construction and trafficking)*
 - *wide-width tension tests*
 - *cyclic tension tests*
 - *cyclic pullout tests*

Task 2 – Setup Monitoring Equipment

- *setup rut data storage and analysis spreadsheets*
- *program and test data acquisition system*
- *install power station and data acquisition trailer*

Task 3 – Planning and Construction

- *procure and deliver base course aggregate*
- *construct test sections (scheduled to begin week of July 2)*

Task 4 – Install Instrumentation

- *install instrumentation boxes, wire and data acquisition computer*
- *install strain gages on geosynthetics*
- *attach lead wires to geosynthetics to facilitate displacement measurements*

Task 5 – Trafficking and Data Collection

- *load and weigh trafficking vehicle*
- *traffic test sections and measure rut*

Task 6 – Forensic Investigations –

- *conduct forensic excavations (estimated to occur end of September)*

Task 7 – Data Analysis

- *begin analyzing construction data: vane shear, LWD, DCP, in-field CBR, and rut data*

Task 8 – Reporting

- *write Task Report #2*
- *write Progress Report #4*

Significant Results:

The project is progressing as planned, with no significant results to be shown at this point.

Circumstance Affecting Project or Budget:

There are no known issues that will negatively impact the quality of the project, its timeline or budget at this time.

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.