

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: *November 18, 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.

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 type="checkbox"/> Quarter 2 (April 1 – June 30) <input checked="" 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>February 28, 2014</i>	Number of Extensions: <i>1</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>\$560,787</i>	<i>90%</i>

Quarterly Project Statistics:

Total Project Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
<i>12%</i>	<i>\$67,542</i>	<i>81%</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

- *test results were received from independent testing company*
- *results from all geosynthetic tests were summarized in Task Report #3*

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

- *final forensics work was conducted during the week of July 8th*
- *geosynthetics were exhumed and carefully examined to assess damage*
- *DCP and LWD measurements were taken on the subgrade and base course*
- *transverse topographic profiles of the base and subgrade were taken*
- *base course samples were taken and washed sieve analyses were conducted to determine migration of fines from the subgrade*
- *moisture samples of the subgrade were taken near the top and bottom of the subgrade layer*

Task 7 – Data Analysis

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

Task 8 – Reporting

- *Progress Report #7 was written*
- *Task Report #3 was written*

Anticipated work next quarter:

Task 1 – Material Characterization – COMPLETED

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 – COMPLETED

Task 7 – Data Analysis

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

Task 8 – Reporting

- *submit Task Report #4 (summary of post-trafficking forensic investigations)*
- *submit draft Final Report by December 31*

Significant Results:

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

Circumstances Affecting Project or Budget:

Analysis of the budget and spending to this point shows that additional funds are needed to finish the remaining work associated with this project. Funds were depleted more quickly than anticipated due to the additional effort required to construct the test sections in the field and the additional time needed to analyze the data and finalize the project. Additional funding (~\$27k) was provided by Montana Department of Transportation.

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.