TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Nebraska Department of Roads

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.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* TPF-5(193) Suppl. #91	**Transportation Pooled Fund Program - Report Period:** ☐ Quarter 1 (January 1 – March 31) ☑ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ Quarter 4 (October 4 – December 31)	
Project Title: Design Guidance for MGS Placed on or near Slopes		
Name of Project Manager(s): John Reid, Ron Faller, Bob Bielenberg, Karla I	**Phone Number:** 402-472-9064	**E-Mail** rbielenberg2@unl.edu
Lead Agency Project ID: 2611211120001	**Other Project ID (i.e., contract #):** RPFP-16-MGS-2	**Project Start Date:** 10/1/2015
Original Project End Date: 9/30/18	**Current Project End Date:** 9/30/18	**Number of Extensions:** 0

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
$54,309.00	$16,749.95	40%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
	$2,673.22	

Project Description:

The MGS has shown to be a high performance, adaptable system that can be installed on or near slopes. Variations of the MGS have been tested under these conditions, with differing post spacing, post lengths, and blockout depths, depending on the degree of the slope and the guardrail offset in front of the slope. However, gaps in the guidance still exist for some ranges of slopes and offsets, and existing guidance is contained in various documents as well as on the Midwest Pooled Fund Q/A website.

The need exists to fill the gaps in guidance regarding MGS installed near slopes. For example, there is currently limited guidance for: (1) posts installed 1 ft to 2 ft adjacent to a 3H:1V or steeper slope; (2) posts installed less than 1 ft adjacent to a 3H:1V to 6H:1V slope; and (3) posts installed less than 1 ft adjacent to a 6H:1V or flatter slope. In addition, a single document that provides clear, concise guidance on all options available to designers when installing MGS near slopes would be extremely valuable.

The research objectives are to: (1) develop recommendations for MGS installed with slopes and offsets that have not been provided previously and (2) combine all recommendations regarding MGS installed near slopes into a selection guide which clearly presents all options available to designers when placing MGS near slopes.

Major Task List

Literature Review: Review literature pertaining to MGS in combination with slopes.

Selection of Options: Determine slope and barrier combinations requiring guidance, followed by sponsor review and feedback

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

Previously, MwRSF conducted a literature search to compile and summarize research related to the MGS adjacent to slopes. This effort collected information regarding:

1. Collect all previous MASH testing of the MGS adjacent to slopes including MwRSF 2:1 slope testing, MwRSF gabion wall testing on 3:1 slopes, and TTI testing of 31" tall guardrail on 2:1 slopes.
2. Collect bogie testing efforts at MwRSF and others related to guardrail adjacent to slopes.
3. Review current research related to guardrail on slopes including ongoing projects.
4. Review previous guidance on guardrail adjacent to slopes provided by MwRSF through the Midwest Pooled Fund Consulting efforts.

The data from the literature search was reviewed and additional research related to barrier placement adjacent to slopes was added included additional bogie testing of posts on both level terrain and slopes. The literature review was reviewed and edited for use as part of the final report.

In November of 2016, MwRSF had a Midwest Pooled Fund progress update meeting. In that meeting, the scope of this project was reviewed in light of the MGS successfully meeting MASH TL-3 criteria when installed in its standard configuration adjacent to a 2:1 slope. In that meeting, it was decided that the use of standard post length MGS systems on 2:1 slope would greatly simplify the required guidance and scope of this report. Thus, it was agreed to simplify the guidance to denote the allowable configuration under MASH and provide relevant implementation guidance in terms of issues such as working width, special MGS applications, and soil strength considerations. Thus, the scope has been revised to a more simple approach.

IMWRSF has developed simplified guidance for the MGS placed adjacent to slopes. Additionally, estimated deflections

Anticipated work next quarter:

In the upcoming quarter, MwRSF will work on completion of the summary report.

Significant Results:

State survey completed and the literature search was completed.

Scope of project guidance simplified based on recent MASH testing.

Simplified guidance for the MGS adjacent to slope was developed.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

None.

Potential Implementation:

This research would develop a selection guide that presents installation options of the MGS placed near a slope. It would be slope-based such that for a given slope, all allowable variations and locations of the MGS would be presented.