

# Research Project Quarterly Progress Report

**Date:** 7/30/2020                      **Project Number:** TPF-5(430) Suppl. #1, RPFP-20-MGS-2  
**Project Title:** MGS with Reduced Embedment and Post Spacing over Low-Fill Culverts  
**Principal Investigator:** Faller, R.K., Bielenberg, R.W., Lechtenberg, K.A., Rosenbaugh, S.K., Mojdeh Pajouh  
**Principal Contact Information Email:** mojdeh.pajouh@unl.edu                      **Phone:** 402-472-0920  
**Project Start Date:** 1/21/2020                      **Project Completion Date:** 12/31/2022

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30)                      October 31  
 Quarter 2 (October 1 – December 31)                      January 31  
 Quarter 3 (January 1 – March 31)                      April 30  
 Quarter 4 (April 1 – June 30)                      July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total Expenses to Date	Total % of Task Completed	Remaining Budget
1. Project Planning & Management & CAD	\$16,853.00	44.7%	\$7,525.00	\$7,525.00	44.7%	\$9,328.00
2. Dynamic Bogie Testing	\$78,032.00	30.8%	\$23,997.00	\$23,997.00	30.8%	\$54,035.00
3. Dynamic Bogie Testing	\$61,310.00	0.0%	\$0.00	\$0.00	0.0%	\$61,310.00
4. Reporting and Project Deliverables	\$29,717.00	0.0%	\$0.00	\$0.00	0.0%	\$29,717.00
5.						
6.						
8. Total	\$185,912	-	\$31,522.00	\$31,522.00	17.0%	\$154,390.00

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

Previously, MwRSF had started the research effort by conducting six (6) bogie tests to evaluate post behavior through a range of reduced embedment depths. All tests were conducted with W6x8.5 posts. Two tests were performed at each reduced embedment increment of 4 in. from the standard 40 in. MGS post embedment, to a minimum of 28 in. (embedment depths of 28 in., 32 in., and 36 in.). The data from these tests was analyzed and compared with previous testing of guardrail posts at the standard embedment depth of 40 in. The data will also be used to develop post-soil resistance input for computer simulation.

In this quarter, additional bogie testing was conducted. Analysis of the initial bogie tests found that the post soil interaction forces were limited by yielding of the W6x8.5 post used in the first six bogie tests. In order to isolate the soil response at lower embedments, a second set of three bogie tests was conducted with W6x16 posts at 40 in., 34 in. and 28 in. embedments. The data from these tests was further utilized to characterize the post response for shallow embedments. Preliminary modeling of the bogie tests was conducted in LS-DYNA to develop accurate post-soil models for further MGS analysis.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. Additionally, changes to businesses outside of MwRSF may lead to possible delays in material acquisition. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

In the upcoming quarter, MwRSF will continue to develop validated models of the post-soil interaction with reduced embedments and begin simulation analysis of potential MGS design alternatives.

**Total Percentage of Project Completion:**

17.0%

# Research Project Quarterly Progress Report

**Date:** 7/30/2020                      **Project Number:** TPF-5(430) Suppl. #2  
**Project Title:** Additional Retrofit Options for Post Conflicts within AGTs  
**Principal Investigator:** Faller, Rosenbaugh, Rasmussen, Bielenberg, Lechtenberg, Reid, Stolle  
**Principal Contact Information Email:** srosenabugh2@unl.edu                      **Phone:** (402) 472-9324  
**Project Start Date:** 10/1/2018                      **Project Completion Date:** 12/31/2021

<b>Report Period:</b>	<b>Due Date:</b>
<input type="checkbox"/> Quarter 1 (July 1 – September 30)	October 31
<input type="checkbox"/> Quarter 2 (October 1 – December 31)	January 31
<input type="checkbox"/> Quarter 3 (January 1 – March 31)	April 30
<input checked="" type="checkbox"/> Quarter 4 (April 1 – June 30)	July 31

**Project Schedule Status:**

**On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total Expenses to Date	Total % of Task Completed	Remaining Budget
1. <b>Planning &amp; Correspondence</b>	\$27,155	0%	\$110	\$110	0%	\$27,045
2. <b>Design and Analysis</b>	\$106,064	0%	\$0	\$0	0%	\$106,064
3. <b>Bogie Testing</b>	\$99,897	0%	\$0	\$0	0%	\$99,897
4. <b>Reporting and Deliverables</b>	\$18,311	0%	\$0	\$0	0%	\$18,311
5.						
6.						
7.						
8.						
9. <b>Total</b>	\$251,429	0%	\$110	\$110	0%	\$251,319

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

Work has not yet begun on this project, which opened in late 2019, as MwRSF was focused on higher priority projects within the Midwest Pooled Fund program.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

The budget numbers presented herein do not include labor charges from June of 2020 as those expenditures had not yet been charged to the project.

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. Additionally, changes to businesses outside of MwRSF may lead to possible delays in material acquisition. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

Work will begin on the literature review, which will include ongoing projects at other laboratories to prevent research overlap. A survey of the sponsors will be conducted to focus the scope of this project to specific areas and/or issues.

**Total Percentage of Project Completion:**

0%

# Research Project Quarterly Progress Report

**Date:** 7/30/2020                      **Project Number:** TPF-5(430) Suppl. #3, RPFP-20-AGT-2  
**Project Title:** Guidelines for Flaring Thrie-Beam Approach Guardrail Transitions - Phase II  
**Principal Investigator:** Jennifer Rasmussen (Schmidt), Reid, Faller, et al.  
**Principal Contact Information Email:** jennifer.rasmussen@unl.edu                      **Phone:** (402) 472-0870  
**Project Start Date:** 1/21/2020                      **Project Completion Date:** 12/31/2022

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30) ----- October 31  
 Quarter 2 (October 1 – December 31) ----- January 31  
 Quarter 3 (January 1 – March 31)----- April 30  
 Quarter 4 (April 1 – June 30) ----- July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. <b>Project Planning &amp; Correspondence</b>	\$12,644.00	32%	\$4,000.00	32%	\$8,644.00
2. <b>Full-Scale Crash Testing</b>	\$278,516.00	2%	\$6,046.00	2%	\$272,470.00
3. <b>Reporting</b>	\$11,623.00	0%	\$0.00	0%	\$11,623.00
4.					
5.					
6.					
7.					
8.					
9. <b>Total</b>	\$302,783.00		\$10,046.00		\$292,737.00

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

All simulation results for both the pickup truck and small car at numerous impact points were processed and completed. These results were presented to the sponsors in a meeting on April 14, 2020. The CIPs for both the upstream and downstream impacts were selected. Connections were refined with the thrie end terminal connector and the buttress and sent to the sponsor for review in June 2020. The connections were finalized and preliminary CAD drawings were drafted. The radiused thrie beam was ordered from the supplier to check fitment with nesting.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

None.

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

The CAD drawings will be finalized and materials for testing will be acquired.

**Total Percentage of Project Completion:**

4%

# Research Project Quarterly Progress Report

**Date:** 7/28/2020                      **Project Number:** TPF-5(430) Suppl. #4, RPFP-20-TERM-1  
**Project Title:** Further Evaluation of the End Terminals Adjacent to Curb  
**Principal Investigator:** Jennifer Rasmussen (Schmidt), Reid, Faller, et al.  
**Principal Contact Information Email:** jennifer.rasmussen@unl.edu                      **Phone:** (402) 472-0870  
**Project Start Date:** 1/21/2020                      **Project Completion Date:** 12/31/2022

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30) ----- October 31  
 Quarter 2 (October 1 – December 31) ----- January 31  
 Quarter 3 (January 1 – March 31)----- April 30  
 Quarter 4 (April 1 – June 30) ----- July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. <b>Project Planning &amp; Correspondence</b>	\$19,248.00	2%	\$351.00	2%	\$18,897.00
2. <b>Full-Scale Crash Testing</b>	\$176,505.00	0%	\$0.00	0%	\$176,505.00
3. <b>Design &amp; Analysis</b>	\$39,381.00	0%	\$0.00	0%	\$39,381.00
4. <b>Reporting &amp; Deliverables</b>	\$22,074.00	0%	\$0.00	0%	\$22,074.00
5.					
6.					
7.					
8.					
9. <b>Total</b>	\$257,208.00		\$0.00		\$256,857.00

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

An internal kickoff meeting was held to discuss the tasks in the project. Recent MASH crashworthy terminals were discussed to be included as possible options in this project. Only compression-based terminals are being considered. Possible survey questions were discussed to obtain end terminal and curb configurations.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

None.

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

The MASH energy-absorbing end terminal and curb configuration will be selected by reviewing background information and sending a survey to the sponsors.

**Total Percentage of Project Completion:**

1%



# Research Project Quarterly Progress Report

**Date:** 7/30/2020                      **Project Number:** TPF-5(430)\_Suppl5\_RPFP-20-SR-1  
**Project Title:** Development of a Short-Radius Guardrail for Intersecting Driveways or Roadways  
**Principal Investigator:** Jennifer Schmidt, J. Reid, R. Faller, R. Bielenberg, K. Lechtenberg, S. Rosenbaugh  
**Principal Contact Information Email:** rbielenberg2@unl.edu                      **Phone:** (402) 472-9064  
**Project Start Date:** 1/16/2020                      **Project Completion Date:** 12/31/2022

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30) ----- October 31  
 Quarter 2 (October 1 – December 31) ----- January 31  
 Quarter 3 (January 1 – March 31)----- April 30  
 Quarter 4 (April 1 – June 30) ----- July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. <b>Project Planning and Correspondence</b>	\$30,952.00	0.0%	\$0.00	0.0%	\$30,952.00
2. <b>Design and Analysis</b>	\$177,021.00	0.0%	\$0.00	0.0%	\$177,021.00
3. <b>Reporting and Project Deliverables</b>	\$43,059.00	0.0%	\$0.00	0.0%	\$43,059.00
4.					
5.					
6.					
7.					
8.					
9.					

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

The research to develop a MASH TL-3 short-radius guardrail treatment for interesting roadways was initiated part way through the first quarter of 2020. Due to existing project priorities and limited staff due to COVID-19, no work has been done on this project to date. MwRSF anticipates initiating this effort during the quarter.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

None

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. Additionally, changes to businesses outside of MwRSF may lead to possible delays in material acquisition. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

MwRSF will begin with a review of the member states standards for intersecting roadways to identify general site constraints and survey states for further site constraint information. Once the site constraints have been identified and defined, MwRSF will develop preliminary design concepts for the new short-radius guardrail system. Concepts from previous MwRSF short-radius and intersecting roadway treatments will be reviewed and reconsidered. Additionally, new concepts will be developed as needed to meet the states desires.

**Total Percentage of Project Completion:**

0.0%

# Research Project Quarterly Progress Report

**Date:** 7/30/2020                      **Project Number:** TPF-5(193) Suppl. #147 RPFP-19-CONSULT  
**Project Title:** Annual Consulting Services Support  
**Principal Investigator:** Jennifer Schmidt, J. Reid, R. Faller, R. Bielenberg, K. Lechtenberg, S. Rosenbaugh  
**Principal Contact Information Email:** rbielenberg2@unl.edu                      **Phone:** (402) 472-9064  
**Project Start Date:** 1/21/2020                      **Project Completion Date:** 12/31/2022

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30) ----- October 31  
 Quarter 2 (October 1 – December 31) ----- January 31  
 Quarter 3 (January 1 – March 31)----- April 30  
 Quarter 4 (April 1 – June 30) ----- July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. <b>Project Planning and Correspondence</b>	\$60,647.00	0.0%	\$0.00	0.0%	\$60,647.00
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

This project allows MwRSF to be a valuable resource for answering questions with regard to roadside safety issues. MwRSF researchers and engineers are able to respond to issues and questions posed by the sponsors during the year. Major issues discussed with the States have been documented in our Quarterly Progress Reports and all questions and support are accessible on a MwRSF Pooled Fund Consulting web site.

In the past quarter MwRSF has responded to a series of state inquiries. The Quarterly Progress Report summarizing these responses has been attached to this document. The summary will also be available for download at the recently completed MwRSF Pooled Fund Consulting web site - <http://mwrsf-qa.unl.edu/>

We are continuing to work with and improve the MwRSF Pooled Fund Consulting web site as our experience with it grows. We would ask that all Pooled Fund member states use the new site from this point forward for their inquiries and to contact us with any issues they experience with the web site.

The summary of the consulting effort for this quarter is typically attached with the progress update. Previously, the MwRSF website was undergoing revision and we were unable to create the summary for several quarters. The website is now operational, but issues still existing with uploading Q&A responses from emails. We are working on rectifying the situation with the website administrator. As such, we are unable to provide the summary for this quarter.

Note that consulting inquiries are currently being dealt with under TPF-5(193) Suppl. #147 until the funding in that effort is depleted.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

The summary of the consulting effort for this quarter is typically attached with the progress update. Previously, the MwRSF website was undergoing revision and we were unable to create the summary for several quarters. The website is now operational, but issues still existing with uploading Q&A responses from emails. We are working on rectifying the situation with the website administrator.

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. Additionally, changes to businesses outside of MwRSF may lead to possible delays in material acquisition. MwRSF will continue to make progress on this research in the most effective manner possible moving forward

**Anticipated Work Next Quarter:**

MwRSF will continue to answer questions and provide support to the sponsors during the upcoming quarter.

We would ask that all questions be submitted through the web site so that they can be answered and archived therein.

<http://mwrsf-qa.unl.edu/>

**Total Percentage of Project Completion:**

0.0%

# Research Project Quarterly Progress Report

**Date:** 7/31/2020                      **Project Number:** TPF-5(430) Suppl. #7, RPPF-20-PFCHS  
**Project Title:** Pooled Fund Center for Highway Safety  
**Principal Investigator:** Reid, Bielenberg, Faller, Holloway, Lechtenberg, Rosenbaugh, Rasmussen,  
**Principal Contact Information Email:** kpolivka2@unl.edu                      **Phone:** (402) 472-9070  
**Project Start Date:** 1/21/2020                      **Project Completion Date:** 12/31/2022

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30) ----- October 31  
 Quarter 2 (October 1 – December 31) ----- January 31  
 Quarter 3 (January 1 – March 31) ----- April 30  
 Quarter 4 (April 1 – June 30) ----- July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. Website Develop, Populate, and Host	\$14,330.00	32%	\$4,597.00	32%	\$9,733.00
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

This is continuation funding for the original project. Funds from Project Title: Pooled Fund for Highway Safety. Funding from Project No.: RPPF-19-PFCHS – TPF-5(193) Supplement #148, Project Title: Pooled Fund for Highway Safety have been exhausted. All future work will be reported in this project.

An external source was selected to transition and support the MwRSF website which includes the Pooled Fund sites of the Research Hub and the Q&A sites. This was done in order to create a more stable site as well as to have more reliable support for updates and any issues that may arise. At the end of this quarter, we were nearing having the transition complete.

Completed reports and projects were added to the Research Hub.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

This is continuation funding until the funds from Project No.: RPPF-19-PFCHS – TPF-5(193) Supplement #148, Project Title: Pooled Fund for Highway Safety have been exhausted.

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

Complete the transition of the site to more stable and reliable server. Troubleshoot and fix any issues that have occurred during the transition.

Continued maintenance, repair, and upkeep of the website

Updated research hub with new completed projects.

**Total Percentage of Project Completion:**

30%

# Research Project Quarterly Progress Report

**Date:** 7/28/2020                      **Project Number:** TPF-5(430) Suppl. #8, RPFP-20-LS-DYNA  
**Project Title:** LS-DYNA Modeling Enhancement Support  
**Principal Investigator:** Jennifer Rasmussen (Schmidt), Reid, Faller, et al.  
**Principal Contact Information Email:** jennifer.rasmussen@unl.edu                      **Phone:** (402) 472-0870  
**Project Start Date:** 1/21/2020                      **Project Completion Date:** 12/31/2022

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30) ----- October 31  
 Quarter 2 (October 1 – December 31) ----- January 31  
 Quarter 3 (January 1 – March 31)----- April 30  
 Quarter 4 (April 1 – June 30) ----- July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. <b>LS-DYNA Modeling Enhancement</b>	\$30,616.00	0%	\$0.00	0%	\$30,616.00
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9. <b>Total</b>	\$30,616.00		\$0.00		\$30,616.00



**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

The Year 30 LS-DYNA modeling enhancement support was initiated part way through the first quarter of 2020. Due to remaining funds in the Year 29 LS-DYNA modeling enhancement support, no funds will be utilized from this project until Year 29 modeling funds are depleted.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

None.

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

None - due to remaining funds in the Year 29 LS-DYNA modeling enhancement support, no funds will be utilized from this project until Year 29 modeling funds are depleted.

**Total Percentage of Project Completion:**

0%



**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

In this quarter, completed the majority of the system fabrication for the barrier system including the slope formation and post installation. The system is currently behind several other systems in the testing queue and will be tested as soon as possible.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

Note that the original start date for the project was listed as October of 2019 with an end date in the 3Q of 2021 (Sept. 30, 2021). Authorization for the project was not received until January 2020, so the end date has been pushed back accordingly to end of December 2021.

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. Additionally, changes to businesses outside of MwRSF may lead to possible delays in material acquisition. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

In the next quarter, MwRSF anticipates conducting the full-scale crash testing of the MGS with 1/2 post spacing adjacent to slope.

**Total Percentage of Project Completion:**

14.6%

# Research Project Quarterly Progress Report

**Date:** 7/30/2020                      **Project Number:** TPF-5(430) Suppl. 12 – FY20-WY-1-GATE: MASU2016 TL 2  
**Project Title:** Evaluation of Drop-Arm Road Closure Gate  
**Principal Investigator:** R. Bielenberg and R. Faller,  
**Principal Contact Information Email:** rbielenberg2@unl.edu                      **Phone:** (402) 472-9064  
**Project Start Date:** 2/26/2020                      **Project Completion Date:** 9/30/2021

**Report Period:**    **Due Date:**  
 Quarter 1 (July 1 – September 30) ----- October 31  
 Quarter 2 (October 1 – December 31) ----- January 31  
 Quarter 3 (January 1 – March 31)----- April 30  
 Quarter 4 (April 1 – June 30) ----- July 31

**Project Schedule Status:**  
 **On Schedule**  
 **On Approved Revised Schedule**  
 **Ahead of Schedule**  
 **Behind Schedule**

**Progress:**

Task	Total Budget	% work Completed This Quarter	Expenses This Quarter	Total % of Task Completed	Remaining Budget
1. <b>Project Planning and Correspondence</b>	\$17,507.00	26.2	\$4,595.00	26.2	\$12,912.00
2. <b>Design and Analysis</b>	\$10,862.00	0	\$0.00	0	\$10,862.00
3. <b>Full-Scale Crash Testing</b>	\$185,441.00	0	\$0.00	0	\$185,441.00
4. <b>Reporting and Project Deliverables</b>	\$16,147.00	0	\$0.00	0	\$16,147.00
5.					
6.					
7.					
8.					
9.					

**Progress and Accomplishments this Quarter:**

*(Provide an informative summary of tasks/activities that occurred this quarter includes meetings, work plan status, significant progress, etc.)*

Previously, MwRSF reviewed the standard details for the WYDOT road closure gate and compared the system with the original NCHRP Report 350 system evaluated at TTI. Additionally, MwRSF reviewed the standard to determine all of the relevant system details for testing and is working with WYDOT, Valmont, and B&B Roadway to ensure that all of the system components are clearly detailed.

In this quarter, MwRSF developed preliminary CAD details for the road closure gate. Several issues were identified and additional details for the system were obtained from Valmont and B&B Roadway on various system components. The CAD details are nearly completed and will be sent to the sponsor for review when completed.

**Circumstances Affecting Project, Scope, or Budget:**

*(Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints, along with recommended solution to those problems.)*

The COVID-19 pandemic and business responses may play a factor in future efforts. MwRSF has not been shut down and is still working, but much of the personnel has transitioned to working remotely, as has much of the country during this time of social distancing. This major shift in regular work operations may lead to delays and inefficiencies as well as other unforeseen hurdles. Additionally, changes to businesses outside of MwRSF may lead to possible delays in material acquisition. MwRSF will continue to make progress on this research in the most effective manner possible moving forward.

**Anticipated Work Next Quarter:**

In the next quarter, MwRSF will complete the CAD details and submit them to WTDOT for review. Once WYDOT comments are received, MwRSF will determine critical impact angles for the full-scale testing and put the system in the test queue for full-scale crash testing.

**Total Percentage of Project Completion:**

2.0%