TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Michigan 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.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* TPF-5(363) [CY 2019]	**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 1 – December 31)	
Project Title: Evaluation of 0.7″ Diameter Carbon Fiber Reinforced Polymer (CFRP) Pretensioning Strands in Prestressed Beams		
Name of Project Manager(s): Matthew Chynoweth	**Phone Number:**	**E-Mail**
Lead Agency Project ID: OR15-541	**Other Project ID (i.e., contract #):** 2016-0065/Z3	**Project Start Date:** 12/05/2017
Original Project End Date: 09/30/2020	**Current Project End Date:** 09/30/21	**Number of Extensions:** 1

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
$358,732.00	$163,968.34	55%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$11,268.13 and 3.1%	$160,611.18	75%

Project Description:

Background:

MDOT has been working with Lawrence Technological University [in Michigan] for many years to develop carbon fiber reinforced polymer (CFRP) prestressed concrete beams. Recent research developments on demonstration projects have shown that 0.6 inch diameter CFRP strands have smaller nominal area and lower allowable capacity than steel 0.6 inch diameter steel strands; thus requiring more strands for a given design. This makes it difficult for bridge designers to find projects where we can fit enough CFRP strands in a beam to meet load carrying requirements.

Currently, 0.7 inch diameter CFRP strands are available; thus, making the use of CFRP pre-tensioning in pre-stressed beams more viable. The proposed research is necessary in order to evaluate the safe use of 0.7 inch diameter CFRP strands in a beam to meet load carrying requirements.

Objectives:

1. To evaluate material properties, details, and design criteria to use 0.7 inch diameter CFRP strands for pretensioning of prestressed AASHTO I girders, bulb-t, and box beams.

2. To evaluate performance of 0.7 inch diameter CFRP strands for environmental conditions and extreme events.

3. To prepare design procedures and examples.

4. To prepare construction specifications for 0.7 inch CFRP strands and identify fabrication concerns with the larger diameter strands.

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

The research team worked on Tasks 4-9 this period.

Anticipated work next quarter:
Continue work on all active research tasks.

Significant Results:
The research team continues to share the test results with MDOT engineers as well as engineers from other DOTs participating in the project. A progress meeting is scheduled in Jan. 2020, where the PI will provide a detailed update on the progress of the project.

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).

Load cells as well as several other sensors were also purchased recently. Both the environmental and the fire chambers went under extensive maintenance/repair that required replacement of key hardware components and refrigerants.

Potential Implementation: