

## TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): IOWA DOT

### 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.*

<b>Transportation Pooled Fund Program Project #</b> TPF-5(366)	<b>Transportation Pooled Fund Program - Report Period:</b> X Quarter 1 (January 1 – March 31, 2020) Quarter 2 (April 1 – June 30, 2020) Quarter 3 (July 1 – September 30, 2020) Quarter 4 (October 4 – December 31, 2020)	
<b>Project Title:</b> Development of a Design Guide for the Structural Design of Ultra High Performance Concrete		
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<b>Lead Agency Project ID:</b>	<b>Other Project ID (i.e., contract #):</b> Addendum 618	<b>Project Start Date:</b> 6/15/17
<b>Original Project End Date:</b> 5/31/18	<b>Project End Date:</b> 11/30/2020	<b>Number of Extensions:</b> Pooled fund project – yearly budgets

On schedule     
  On revised schedule     
  Ahead of schedule     
  Behind schedule

### Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Total Percentage of Work Completed
\$179,213	\$86,399	40%

### Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$14,945		3%

**Project Description:** Ultra-High Performance Concrete (UHPC) has been recognized as a choice of material for mitigating bridge infrastructure challenges as well as to introduce innovative construction projects. In recent years, the use of UHPC has gained momentum in bridge projects across the country. However, formal structural design guidance for this material does not exist in North America, and therefore a comprehensive effort is required to formulate recommended design guidance so that the application of this material can be broadened.

The overall objective of this study is to facilitate advancement in the state-of-the-practice for UHPC in the US highway sector, which will include development of a design and construction guide specification. These advancements will also focus on other critical needs that are currently hindering the wider use of UHPC

A Steering Committee will be formed for this Pooled Fund Project. This Steering Committee can include contributing entities and will be led by the host State. The tasks are:

1. Coordinate meetings amongst committee members with the goal of study execution and information dissemination.
2. Provide guidance on national level advancement efforts.
3. Develop and prioritize research needs statements.
4. Develop, verify, and/or standardize test methods for assessment of UHPC material properties.
5. Complete structural performance-related research as necessary to develop greater knowledge of structural behavior.
6. Complete construction-related research as necessary to develop greater understanding of optimal construction processes.
7. Coordinate, share, and advance existing special provisions for the use of UHPC in highway construction projects.

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

**December 31, 2019**

Compressive tests on cubes and cylinders were performed at 14 days, 28 days, 60 days and 72 days (3 cubes and 3 cylinders were used at each age) as required in the project. Over 1000 tapered Aluminum plates required for specimen preparation were manufactured at Iowa State University. After the test units were cured for 60 days, the aluminum plates were attached to all 216 test units according to the FHWA guidelines. Guidelines for testing of the samples were prepared so that they can be shared with all participating test laboratories. Four laboratories have agreed to participate in the project and discussion with two other labs is in progress. After the samples were prepared, they were shipped to two participating labs along with the LVDT measurement setup. Progress of the project was discussed with the Project Advisory Panel and feedback was received.

**Anticipated work next quarter:**

Testing of all the specimens was planned to be completed during next quarter. Testing is however on hold due to COVID '19.

**Significant Results**

Around 1000 tapered Aluminum plates required for specimen preparation were manufactured. Guidelines required for testing of the samples in a consistent was prepared. Test specimens were prepared and shipped to the first two testing laboratories.