

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.

Transportation Pooled Fund Program Project # TPF-5(366)	Transportation Pooled Fund Program - Report Period: Quarter 1 (January 1 – March 31, 2019) Quarter 2 (April 1 – June 30, 2019) Quarter 3 (July 1 – September 30, 2019) X Quarter 4 (October 4 – December 31, 2019)	
Project Title: Development of a Design Guide for the Structural Design of Ultra High Performance Concrete		
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Lead Agency Project ID:	Other Project ID (i.e., contract #): Addendum 618	Project Start Date: 6/15/17
Original Project End Date: 5/31/18	Project End Date: 11/30/2020	Number of Extensions: 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	\$71,454	40%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$6,312.19		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

Two LVDT setups to be used for the tensile tests have been manufactured. Materials required for the project were received from three different UHPC suppliers. Few sample specimens were cast with different UHPC mixes and respective fiber volume fractions that were chosen for the study. Uniaxial tension tests were performed on the samples using the MTS tensile testing machine. Following a confirmation that these tensile tests on the sample specimens were satisfactory, casting of the main test specimens was started. Each UHPC mix specimens were cast in three pours, with each pour producing 24 tensile test specimens, twelve 2 in. cubes and twelve 3in. x 6in. cylinders. In total, 72 tensile specimens, 36 cubes and 36 cylinders were cast for each UHPC mix. All the specimens are being cured at room temperature. Compressive tests on cubes and cylinders have been performed at the ages of 14days and 28 days as required in the project.

Anticipated work next quarter:

After the test units reached 60 days of curing, they will be prepared according to the FHWA guidelines. Once the samples are prepared, samples will be shipped out to participating labs along with the LVDT setup. Tests will be scheduled and executed.

Significant Results

Casting of more than 200 tensile test specimens were done. These specimens represent three different UHPC and three different fiber percentages.