

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: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31, 2022) <input type="checkbox"/> Quarter 2 (April 1 – June 30, 2022) <input type="checkbox"/> Quarter 3 (July 1 – September 30, 2022) <input type="checkbox"/> Quarter 4 (October 4 – December 31, 2022)	
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: 10/31/2022	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
\$239,528	\$187,190	65%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$41,840		5%

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.):

Progress This Quarter:

Task 1 – Testing of the final set of samples at FHWA was completed. Results from the tests were analyzed and updated in the draft journal paper summarizing outcomes.

Task 2 – Casting of the specimen sets with different fiber types (PVA, POM, Minibars, and hooked-end steel fibers) has been completed. Testing of specimens with different steel fiber volumes and the same UHPC type has been completed. Preparation of all other specimens has been completed, and the testing will take place in the next quarter.

Anticipated work next quarter:

The updated final document will be submitted for journal publication with approval from TAC.

Testing of all the remaining specimens is planned for the next quarter. The results of the specimens will be analyzed and reported.

Significant Results:

Testing of the final set of samples from task 1 used a flat gripping system and a new test machine and produced a 60-70% success rate. Tensile responses from the successful tests are similar to the other laboratories. The testing procedure showed an 80% success rate for a set of specimens with different fiber volumes and the same UHPC type. An increasing multi-cracking phase with increasing fiber volume was observed in sets of specimens with the same UHPC but with different fiber volume fractions. The test results will be further evaluated and analyzed for different phases of the tensile test response.