

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Kansas 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(336)	Transportation Pooled Fund Program - Report Period: <input checked="" type="checkbox"/> Quarter 1 (January 1 – March 31) 2016 <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31)	
Project Title: Construction of Low-Cracking High-Performance Bridge Decks Incorporating New Technology		
Project Manager: Rodney Montney	Phone: 785-291-3844	E-mail: Rodney@ksdot.org
Project Investigator: David Darwin	Phone: 785-864-3827	E-mail: daved@ku.edu
Lead Agency Project ID:	Other Project ID (i.e., contract #):	Project Start Date: January 1, 2016
Original Project End Date: December 31, 2018	Current Project End Date: December 31, 2018	Number of Extensions: 0

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	Total Percentage of Work Completed
\$270,000	\$14,491.39	5%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
\$14,491.39	\$14,491.39	5%

Project Description:

Bridge decks constructed using low-cracking high-performance concrete (LC-HPC) have performed exceedingly well when compared with bridge decks constructed using conventional procedures. The LC-HPC decks have been constructed using 100% portland cement concretes with low cement paste contents, lower concrete slumps, controlled concrete temperature, minimum finishing, and the early initiation of extended curing. Methods to further minimize cracking, such as internal curing in conjunction with selected supplementary cementitious materials, shrinkage-reducing admixtures, shrinkage-compensating admixtures, and fibers have yet to be applied in conjunction with the LC-HPC approach to bridge-deck construction. Laboratory research and limited field applications have demonstrated that the use of two new technologies, (1) internal curing provided through the use of pre-wetted, fine lightweight aggregate in combination with slag cement, with or without small quantities of silica fume, and (2) shrinkage compensating admixtures, can reduce cracking below values obtained using current LC-HPC specifications. The goal of this project to apply these technologies to new bridge deck construction in Kansas and Minnesota and establish their effectiveness in practice. Additional states may be added as the study progresses.

The purpose of this study is to implement new technologies in conjunction with low-cracking high-performance concrete bridge specifications to improve bridge deck life through reduction of cracking. The work involves cooperation between state departments of transportation (DOTs), material suppliers, contractors, and designers. The following tasks will be performed to achieve this objective.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):**TASK 1: Work with state DOTs on specifications for the construction of six LC-HPC bridge decks per state to be constructed over a three-year period.**

Conference calls were held between representatives from the University of Kansas (KU) and Minnesota Department of Transportation (MnDOT). The meetings focused on the construction of two project bridge decks (with two control bridge decks) in the State of Minnesota. MnDOT has developed specifications and let the first two bridges.

KU researchers met with Kansas Department of Transportation (KDOT) representatives on to discuss specifications for LC-HPC bridge decks utilizing internal curing with lightweight fine aggregate for six bridge decks.

20% COMPLETE

TASK 2: Provide on-site guidance during construction of the LC-HPC bridge decks.

0% COMPLETE

TASK 3: Perform detailed crack surveys on the bridge decks, 1 year, 2-3 years, and (if approved) 4-5 years after construction. Prior research has demonstrated that it takes at least three years to consistently establish the long-term cracking performance of a bridge deck. The surveys will be performed using techniques developed at the University of Kansas to identify and measure all cracks visible on the upper surface of the bridge deck. If desired, DOT personal will be trained in the survey techniques and may assist in the surveys, as appropriate.

This task will be performed after the construction of the bridge decks. Crack surveys of the internal curing and control decks will be conducted during the summer, one and three years after construction.

0% COMPLETE

TASK 4: Correlate the cracking measured in Task 3 with environmental and site conditions, construction techniques, design specifications, and material properties, and compare with results obtained on earlier conventional and LC-HPC bridge decks.

0% COMPLETE

TASK 5: Document the results of the study. Interim and final reports will be prepared covering the findings in Tasks 1-4.

0% COMPLETE

Anticipated work next quarter:

Future meetings and conference calls will be held. KU will develop recommendations to implement the specifications. Pre-construction meetings will be held in Minnesota; representatives from KU, representatives from MnDOT, and the contractor will attend to discuss the details of the construction. KU will evaluate materials from Minnesota. KU will continue to work with KDOT on the development of specifications.

Significant Results this quarter:

Initial steps have been taken for developing specifications in Kansas and initiating construction in Minnesota.

Circumstances 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).

Nothing to report.