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(098)**	**Transportation Pooled Fund Program - Report Period:** ☐Quarter 1 (January 1 – March 31) X☐Quarter 2 (April 1 – June 30) ☐Quarter 3 (July 1 – September 30) ☐Quarter 4 (October 4 – December 31)

Project Title: Self-Consolidating Concrete-Applications for Slip-Form Paving, Phase 2		
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Lead Agency Project ID: RT 0204	**Other Project ID (i.e., contract #):** Addendum 285	**Project Start Date:** 12/7/06
Original Project End Date: 12/16/10	**Current Project End Date: 6/30/11**	**Number of Extensions:**

Project schedule status:

☐ On schedule ☐ On revised schedule ☐ Ahead of schedule **X** Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Total Percentage of Work Completed
130,000	128,973	99%

Quarterly Project Statistics:

Total Project Expenses This Quarter	Total Amount of Funds Expended This Quarter	Percentage of Work Completed This Quarter
88	88	10%

Project Description:

The aim of the project is to develop a new type of self-consolidating concrete (SCC) for slip-form paving to simplify construction and make smoother pavements. The new SCC development was composed of two Phases: (I) feasibility study and (II) in-depth mix proportioning and performance study as well as field applications.

In the Phase II study, effects of different materials and admixtures on rheology, especially the thixotropy, and "green" strength of fresh SFSCC have been further investigated. General properties of hardened SFSCC, such as heat of hydration, set time, compressive strength, permeability, drying shrinkage behavior, F-T durability and scaling resistance were examined. The results were compared with those of conventional pavement concrete. A performance-based SFSCC mix proportioning method was developed. Finally, three field applications and SFSCC were conducted, and the field SFSCC performance was monitored.

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

1. Final report is in final editing and should be submitted within the next couple of weeks.

Anticipated work next quarter:

None. Final report will be submitted within the next couple of weeks.

Significant Results:

The following recommendations are proposed for implementing the results from the present research:

(1) SFSCC is approved to be well-suited for slip form construction of bike paths, sidewalks, and local street pavements. It can also be applied for cast-in-place concrete, such as bridge decks and pavement cross sections, where flowable concrete is desirable but conventional SCC is unable to make a crown or slope for the structures. In the present study, the maximum thickness of SFSCC used in field constructions is about 6 inches. To avoid side slump, it is suggested that multiple lift construction shall be explored if much thicker pavements are constructed.

(2) Field application of SFSCC would be extended if a paver specifically designed for SFSCC was available. Development of such new paving equipment hasn't been included in the present study, and it shall be considered in the future. It is suggested that the new paver for SFSCC paving shall be able to uniformly distribute SFSCC in front of the paver, provide a minimal pressure on the concrete during its extrusion, and have a sufficient length of side legs to mold and hold the extruded concrete for a sufficient time so as to allow the SFSCC to develop sufficient shape-holding ability as the paver is moving forward.

(3) Among five SFSCC mixes tested for scaling resistance to deicing chemicals, some SFSCC showed a comparable or higher resistance to that of conventional pavement concrete, while others displayed a lower resistance. The lab test results seemed not well consistent with that of field concrete. More studies shall be conducted on the potential factors affecting SFSCC scaling resistance (e. g. effects of fines and nano-clay additions).While shrinkage reduction technology, such as self-curing technology, is explored for SFSCC, other durability properties of SFSCC, such as thermal expansion, alkali-silica reaction, sulfate resistance, may also be investigated

Circumstance affecting project or budget (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).