

Quarterly Progress Report – December 2009
For the period October 1, 2009 to December 31, 2009
Pooled Fund TPF-5(098)

Project Dates: December 7, 2006 – December 6, 2010
Project Title: Self-Consolidating Concrete-Applications for Slip-Form Paving, Phase 2
Principal Investigator: Kejin Wang, voice: 515-294-2152, email: kejinw@iastate.edu

Progress Report:

Project is on schedule	Behind (due to delayed field application & scope change)
Project is within budget	Yes
Significant changes in project description	Yes (Please see the March 2009 report)

Problems (current or anticipated):

Products and tangible results this quarter (reports/articles written, oral reports/interviews):

Interaction with Technical Monitor and/or Project Advisory Committee (brief recount of meetings):

An ISU team meeting was held on October 28, 2009 and the meeting summary was sent to all TAC members shortly after the meeting.

Brief summary of this quarter's research:

1. A study is being conducted to investigate the effects of shrinkage reducing admixture (SRA) on the shrinkage cracking of SF-SCC. Different dosages of SRA are incorporated into the concrete mixture used in the North Riverside pavement (Mix 1). Free shrinkage and restrained shrinkage cracking (ring) tests are performed. (This study is added to the project according to the discussions at the 10/28/09 meeting.)
2. A study on the resistance of SFSCC mixture to scaling due the deicing chemicals was conducted. The mixtures studied were C-3WR-C20, North Riverside pavement mixtures M1 and M3, with and without Actigel and SFSCC with limestone dust. The scaling tests showed that the originally designed SF SCC mixture used in the North Riverside pavement (NR-M1-A) is less susceptible to CaCl₂ deicing solution than C-3WR-C20. The mixtures with Actigel had less scaling compared to mixtures without Actigel.
3. The field trial pavements at South 4th street and North Riverside drive are continuously being monitored. There is some localized scaling on the southern side of the South 4th street pavement. No other distress is observed. On the North Riverside drive pavement, the portions made with Mix 3 and Mix 2 had experience cracking, however, the section made with Mix 1, the original SF-SCC mix, remains in good condition.

Main emphasis for next quarter:

1. Continue testing the cracking potential of SF-SCC mixtures and develop mitigating measures to reduce cracking potential.
2. Continue monitoring the performance of the SCC pavements.
3. Continue testing the cracking potential of SF-SCC mixtures specifically containing clays (ACBM)

Task #	Phase II Task Description	Completion date expected	% of task completed
1	Mix Design Refinement and Field Trial Testing		
1.1	<i>Further Study SF SCC Materials and Mix Proportions</i>	December 2007	90
1.2	<i>Conduct Quality Control Tests for Selected SF SCC Mixtures</i>	December 2007	90
1.3	<i>Investigate Engineering Properties and Durability of SF SCC Candidates</i>	December 2007	90
1.4	<i>Conduct Field Paving Trial Tests Using SF SCC (combined with field applications)</i>	August 2008	90
1.5	<i>Develop SF SCC Mix Design Methodology and Acceptance Criteria</i>	August 2008	85
1.6	<i>Further Study the "Green" Strength, Shape-holding Ability, and Compactibility of SF SCC</i>	December 2008	85
1.7	<i>Complete Test Data Analyses and Prepare Task 1 Report (will be combined with Task 2 report)</i>	December 2008	50
2	Field Investigation of SF SCC Paving		
2.1	<i>Select/Modify Paving Equipment for SF SCC Applications (stopped due to the scope change)</i>	August 2008	10
2.2	<i>Determine Construction Times and Locations</i>	August 2008	60
2.3	<i>Perform Field Tests to Characterize SF SCC Performance</i>	August 31, 2008	80
2.4	<i>Analyze Field Test Data and Establish Primary Guidelines for SF SCC Paving</i>	December 2008	45
2.5	<i>Prepare Task 2 Report</i>	December 2008	10
3	Performance Monitoring and Technology Transfer		
3.1	<i>Field Performance Monitoring of SF SCC Pavement</i>	September 2010	50
3.2	<i>Technology Transfer</i>	December 2010	0
3.3	Prepare Final Report for Entire Project	December 2010	0

* Significant changes have been made in project description:

- (1) We are combining the field trial (Task 1) with field applications (Task 2).
- (2) Considering the cost of the concrete materials, we are trying to reduce the cement content in the new SCC, therefore, the activities in task 1 are extended.
- (3) As stated in this quarterly report, we plan to perform more study on shrinkage behavior of SF SCC in 2009, and may conduct another field application in 2010.

DATA FOR THE QUARTER ENDING DECEMBER 31, 2009

BUDGET CATEGORY DESCRIPTION	AMOUNT BUDGETED	EXPENDITURES THIS PERIOD	CUMULATIVE EXPENDITURES
TRAVEL	\$10,000.00	\$0.00	\$0.00
SUPPLIES/MATERIALS	\$2,000.00	\$0.00	\$2,294.26
SUBCONTRACTS(subj to IDC)	\$25,000.00	\$0.00	\$25,000.00
SUBCONTRACTS(not subj to)	\$66,999.00	\$8,917.40	\$65,256.93
OTHER DIRECT COSTS	\$13,000.00	\$0.00	\$420.00
TOTAL DIRECT COSTS	\$116,999.00	\$8,917.40	\$92,971.19
INDIRECT COSTS (University Overhead)	\$13,001.00	\$0.00	\$7,205.70
CATEGORY TOTALS	\$130,000.00	\$8,917.40	\$100,176.89

NOTES:

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