

Period Covered: April 1 through June 30, 2009 (Quarterly Report)

KSDOT Progress Report  
for the

## State Planning and Research Program

PROJECT TITLE: Construction of Crack-Free Concrete Bridge Decks		
PROJECT MANAGER: Rodney Montney	Project No: TPF-5(051)	Project is: <input type="checkbox"/> PLANNING <input checked="" type="checkbox"/> RESEARCH & DEVELOPMENT
Annual Budget	Multi Year Project Budget \$950,000	

### **PROGRESS:**

Current work for Phase I of Construction of Crack-Free Concrete Bridge Decks includes the evaluation of the bridge decks that were cast in Phase I and the completion of construction of Phase I bridges.

### **LABORATORY ACTIVITIES:**

All laboratory work and evaluations for Phase I have been completed and are described in previous quarterly reports.

### **CONSTRUCTION ACTIVITIES:**

The annual crack surveys for Low-Cracking High-Performance Concrete (LC-HPC) bridges and corresponding control bridges in Kansas began this quarter. To date, an LC-HPC bridge in Reno County, KS showed a crack density of 0.059 m/m<sup>2</sup> at the age of 23.4 months, an LC-HPC bridge in Topeka, KS had a crack density of 0.012 m/m<sup>2</sup> at 34.8 months, and an LC-HPC bridge in Kansas City, KS showed a slightly higher crack density with 0.085m/m<sup>2</sup> at 32.5 months.

The crack densities for control bridges were much higher than those observed on the LC-HPC bridges. The crack densities for two control bridges in Lyon County, KS were 0.265 and 0.599 m/m<sup>2</sup> at 47.5 and 37.8 months, respectively. A control bridge in Linn County, KS had a crack density of 0.127 m/m<sup>2</sup> at the age of 25.5 months. Significant crack growth in a control bridge in Kansas City, KS was noticed, with the crack density increasing to 0.216 m/m<sup>2</sup> at 22.6 months compared with 0.037 m/m<sup>2</sup> at 10.4 months. Severe cracks were observed at another control bridge in Kansas City, KS, which had a crack density of 1.0 m/m<sup>2</sup> at 38.2 months for placement 1 and 0.277 m/m<sup>2</sup> at 32.6 months for placement 2.

The final Phase I LC-HPC bridge in Kansas was placed in Linn County on April 15, 2009. The post-construction conference for two Linn County bridges (one constructed in April 2008 and the bridge constructed in April 2009) was held on June 10, 2009.

**ACTIVITIES PLANNED FOR NEXT QUARTER**

Crack surveys of LC-HPC and control bridge decks that are at least one year of age will continue this quarter.

Project Personnel: David Darwin (Principal Investigator), JoAnn Browning (Co-Principal Investigator)

**STATUS AND COMPLETION DATE**

Percentage of work completed to date for total project is: 99%\*

  X   on schedule \_\_\_\_\_ behind schedule, explain:

Expected Completion Date:   March 31, 2010  

\*The project has been extended for an additional two years to allow the planned deck construction to be completed and the crack surveys to be conducted. The percentage of work completed will be held open at 99% for the balance of the project. Phase II of this project is now underway with funding from the KU Transportation Research Institute and the project has been approved for 100% SPR funding; TPF funding officially began on July 1, 2008.