

KSDOT Progress Report
for the

State Planning and Research Program

PROJECT TITLE: Construction of Crack-Free Concrete Bridge Decks		
PROJECT MANAGER: Richard L. McReynolds, P.E.	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: The first meeting of participating states was held on April 21 at the Airport Hilton in Kansas City, MO. Representatives from DE, IN, KS, MN, MO, MS, MT, ND, NH, SD, TX, and FHWA were in attendance. The representatives discussed current procedures to control cracking in concrete bridge decks, best practices that should be implemented in the project, and the types of bridge decks to be constructed for the project. A summary of advisable bridge deck specifications was collected. A specific discussion item included a request from the research team to the state representatives to evaluate upcoming bridge deck construction projects to determine whether they are candidates for the study. The state representatives were asked to send nominations for possible bridge decks to the research team. Notes from the meeting and a list of attendees were circulated among the state representatives, and returned comments have been incorporated into the revised minutes.

Meetings have been held with representative design, construction and materials personnel regarding their ideas for reducing cracking in concrete bridge decks. Meetings this quarter were held with Wildcat Construction on April 7 and design engineers from HNTB on June 5.

Work has continued on obtaining optimized concrete mix designs to reduce cracking. The primary focus has been on minimizing the paste content, reducing the concrete temperature, and optimizing the aggregate content. Tests for slump, workability and finishability are performed on each mix. The selection of appropriate aggregate sizes received attention this quarter with various sources being evaluated for aggregate blending options. Visits to the LRM Asphalt Plant (April 11) and Hunt Midwest Mining Sunflower Quarry (June 10) were completed. An optimized two-aggregate mix with minimal paste content has been established.

The restrained ring test was selected as the method to be used to quantify the shrinkage potential of the optimized concrete mixes. The testing apparatus is being constructed and the humidity chamber for housing the ring specimens has been constructed.

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

SUMMARY OF ACTIVITIES EXPECTED TO BE PERFORMED NEXT QUARTER:

The revised minutes from the meeting of state representatives on April 21, 2003 will be circulated with the proposed special provisions for construction of crack-free bridge decks. Comments will be solicited from the representatives.

Work will continue to identify new bridge construction projects (in Kansas and in other states) that are eligible for implementing the identified "best practices." A total of 20 bridges will be constructed over the course of the project using the new recommendations.

Meetings will continue to be held with contractors and designers to obtain input on the design, construction, and materials aspects of the project.

Work will continue to optimize mix designs. The next steps include using a three-aggregate mix, coarse-ground cement, water-reducing admixtures, and shrinkage-reducing admixtures. Testing of the optimized mixes for shrinkage potential, freeze-thaw durability and permeability will begin.

STATUS AND COMPLETION DATE

Percentage of work completed to date for total project

Project is: 0.11

 X on schedule behind schedule, explain:

Expected Completion Date: March 31, 2008