

**OHIO DEPARTMENT OF TRANSPORTATION  
QUARTERLY RESEARCH REPORT**



For Quarter Ending: March 31, 2009

Date Submitted: April 3, 2009

<b>Project Title:</b>	Evaluation of Fiber Reinforced Composite Dowel Bars and Stainless Steel Dowel Bars		
<b>Research Agency:</b>	Applied Pavement Technology, Inc.		
<b>Principal Investigator(s):</b>	Roger M. Larson and Kurt D. Smith		
<b>State Job Number:</b>	134411	<b>Agreement Number:</b>	22160
<b>Project Start Date:</b>	October 17, 2008	<b>Contract Funds Approved:</b>	\$54,000
<b>Project Completion Date:</b>	October 17, 2011	<b>Spent to Date:</b>	\$7,529
13.9 % Funds Expended		12 % Work Done	12.5 % Time Expired

**List the Technical Liaisons and other individuals who should receive a copy of this report:**

Roger Green (Office of Pavement – 614-995-5993)

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TPF-5(188) Technical Panel Members: Mark Gawedzinski (Illinois); Andy Gisi (Kansas); Irene Battaglia (Wisconsin); Max Porter (Iowa State University); Seung-Kyoung Lee (FHWA)

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**SUMMARY OF PROGRESS FOR QUARTER:**

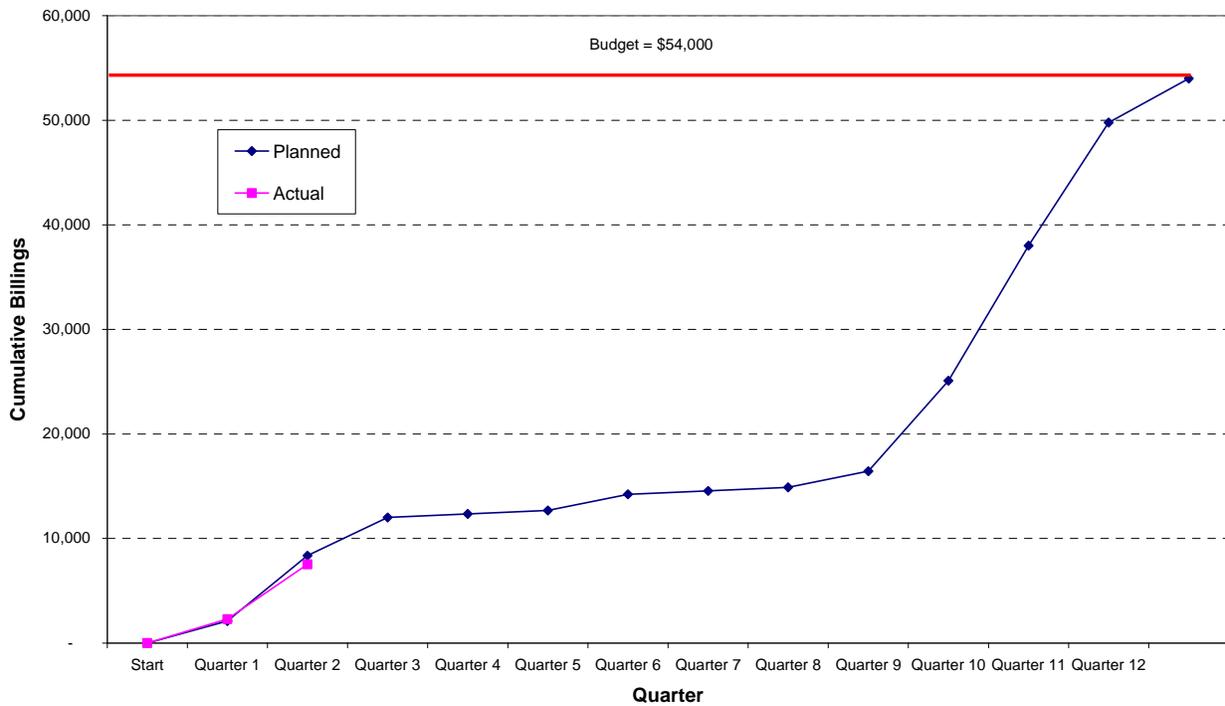
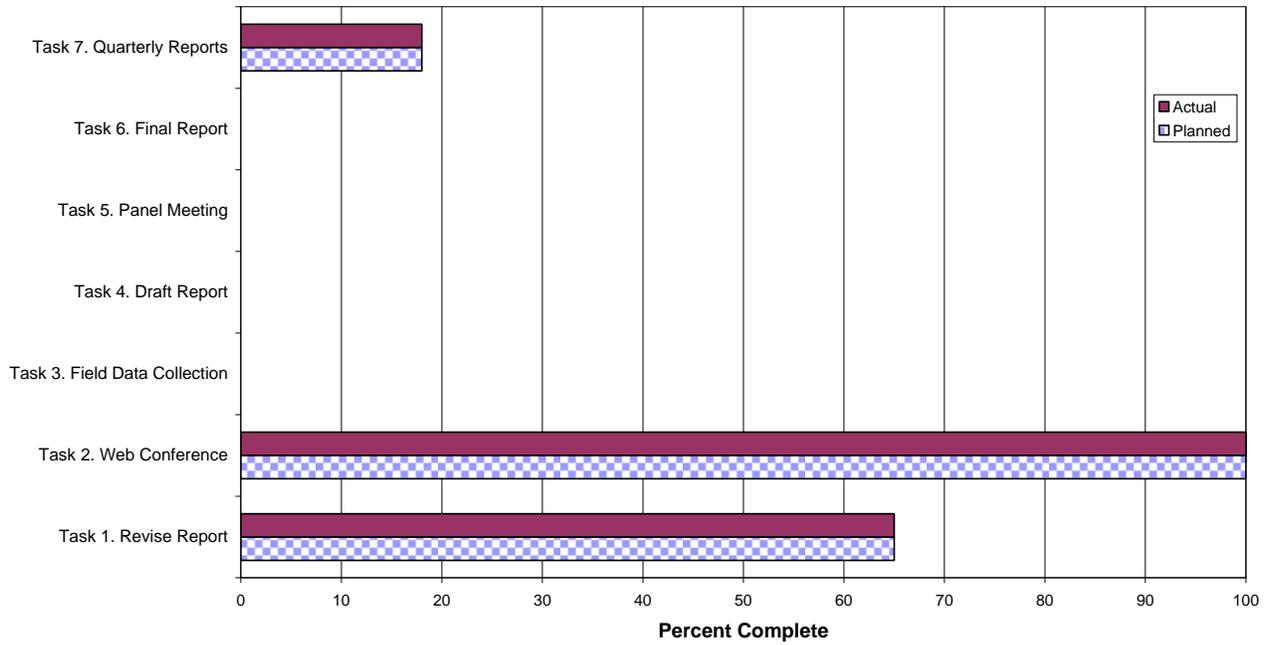
*Attach a progress schedule consisting of graphical information depicting (1) a schedule of research activities tied to **each task** defined in the proposal, (2) a comparative status of actual versus estimated expenditures, (3) a percentage completion of the research, (4) and a brief description of the activities accomplished by **each member** of the research team as listed in the project budget.*

Review comments on the draft Interim Report were received from the Technical Panel. A web conference was held with members of the Technical Panel on February 25, 2009. Draft minutes of the web conference and a Revised Evaluation Plan were prepared by Roger Larson and Kurt Smith and submitted to the Technical Panel for review and comments. Comments from all Technical Panel members on the Revised Evaluation Plan have not yet been received.

The quarterly progress report for the period ending December 31, 2008 was prepared by Roger Larson and Kurt Smith and submitted on March 3, 2009.

Work was begun by Roger Larson on the revisions/updates to the Interim Report and Annotated Bibliography.

### Planned to Actual Progress



### PROPOSED WORK FOR NEW QUARTER:

The Draft Interim Report dated 3-31-05 will be revised and updated. The Revised Evaluation Plan will be modified to reflect Technical Panel review comments when they are received. The target delivery date for the updated Interim Report and Evaluation Plan is May 1, 2009.

### IMPLEMENTATION (if any):

None.

## **PROBLEMS & RECOMMENDED SOLUTIONS (if applicable):**

*(Describe any problems encountered or anticipated that might affect the completion of the project within the time, scope, and fiscal constraints set forth in the contract, along with recommended solutions to those problems. NOTING DIFFICULTIES IN THIS SECTION DOES **NOT** CONSTITUTE A REQUEST TO MODIFY THE PROJECT. Requests for additional time, money, or scope revisions must be submitted in a separate letter to the Office of R&D Administrator.)*

A revised evaluation plan will be prepared with recommended testing by the states to complete the evaluation of the various alternative dowel bar material projects that were constructed in 1997-1998. FWD testing and coring of field projects by the states in calendar years 2009 and 2010 will be recommended.

The revised Evaluation Plan also recommended taking cores of epoxy-coated dowels in 15 to 30<sup>+</sup>-year-old concrete pavements to help evaluate their condition and long-term performance so the relative cost effectiveness of either FRP dowels or stainless steel dowels can be evaluated. No project funding for the chloride testing of the concrete cores taken for the experimental dowels or for the coring and chloride testing of the older epoxy-coated dowel projects is available. This work would have to be conducted by the participating States.

The Ohio DOT has proposed a project with Ohio University to evaluate the FWD deflection/load time history data previously collected for their projects. This will help determine if this data can be used to supplement the LTE and differential information previously evaluated to better predict the expected long-term performance of the various alternative dowel materials and particularly the more flexible FRP dowels which often have lower LTE's than the epoxy-coated or stainless steel dowels.

## **EQUIPMENT PURCHASED (if any):**

None.

## **CONTACTS & MEETINGS:**

*(Describe any meetings or contacts with ODOT technical liaisons and other pertinent individuals relative to this project.)*

As noted above, the web conference was held with the Technical Panel on February 25, 2009. Draft minutes of the meeting and the revised evaluation plan were distributed on March 9, 2009 by Roger Green, Panel Chairman. Comments from Irene Battaglia of WI DOT and by Y-K Lee of FHWA have been received.

On February 20, 2009, Roger Larson distributed the WI/SPR-03-05, June 2006, Final Report on alternate cross sections including alternative dowel bar materials (developed by Dr. James Crovetti of Marquette University) to the Technical Panel. WI DOT has recently released a report evaluating MMFX dowels.

Updated information on the status of related projects in CA were provided by John Harvey, U. of CA (Davis) by e-mail on February 24. All related research has been completed but some reports are in the publication process.

Peter Kopac, FHWA, provided a revised Final Report for the West Virginia University FRP dowel project. This project evaluates different sizes and spacing of FRP dowels although the deflection evaluation was conducted with a loaded truck rather than with a FWD. It is believed some subsequent evaluations have been conducted with a FWD which would make comparisons with this project easier.

The FHWA TechBrief *Long Life Concrete Pavements* includes dowel specification used by Washington State and Minnesota for their long-life PCC pavements. Mn/DOT also has additional data on FRP dowels on the Mn/ROAD project.