

# Progress Report

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|-------------------------------------|--|----------------|--|
| <b>TPF-5(039)<br/>Task Order #1</b> | <b>Falling Weight Deflectometer (FWD) Calibration Center<br/>and Operational Improvements</b>  |                |  |
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| <b>Reporting Period:</b>            | <b>July 1, 2008 through August 31, 2008</b>  |                |  |
| <b>Project Status:</b>              | Work effort (hours) through end of period:   |                | 51.0%  |
|                                     | Project funds expended (pct. of total budget):   |                | 18.5%  |
|                                     | Contract termination date:   |                | Sept. 6, 2009  |

## *Activity during the reporting period*

The focus during this reporting period has been on the following main activities.

- Updating the *WinFWDCal* software and preparing for the release of version 2.0 in fall 2008.
- Preparing for filming the video about FWD calibration in September 2008.
- Preparing for the establishment of new FWD calibration centers in California and Australia.
- Working with the Foundation Mechanics company to improve the compatibility of the *WinFWDCal* software with the JILS FWD.

## *Activity by Task*

### **Task 1 – Operations Manual**

This task has been deferred indefinitely. The reason for the deferral was explained in the previous progress report.

### **Task 2 – Technical Support**

Technical support was provided through a series of telephone calls supplemented by some testing in our laboratory. We worked with the Colorado, Montana, Main Roads Western Australia (MRWA), Dynatest, and the JILS calibration centers.

The Montana center was exhibiting a lack of damping in their test pad which was traced to a large void under one end of the concrete slab. They decided to rebuild the slab to improve the support.

Colorado was having a problem with their computer freezing up while running *WinFWDCal*. We were unable to reproduce the problem in our laboratory, but we replaced a small battery in the computer that may have been causing the problem.

MRWA was experiencing a very slow warm up of their Vishay signal conditioner. We were unable to reproduce the problem in our laboratory. We did some low-temperature warm up tests in a cold room, and we believe the storage of the electronic equipment in an unheated building may be causing the problem.

### **Task 3 – Video Production**

Cornell's Media Services group will assist with the production of the video. A meeting to layout the story board for the project was held on August 6. FHWA's Mike Moravec attended the meeting to assist the project. The Pennsylvania DOT Calibration Center has agreed to collaborate in the production. Filming is scheduled for September 23-25 in Harrisburg, PA, and release of the video is expected near the end of November.

### **Task 4 - Documentation**

Efforts to update the April 2007 draft report were begun in April 2008. The document has been assigned FHWA Report No. FHWA-HRT-07-040. The body of the report has been extensively edited to eliminate much of the redundancy that was in the draft report. Additional appendices have been added covering input/output requirements for PDDX file content, the annual QA review process and checklists, and suggestions for a successful annual calibration. Appendices on the FWD calibration protocol, the specifications and drawings, and the hardware use and installation guide are being revised to incorporate changes that have been made since late 2006.

During this reporting period drawings were prepared for all of the parts in the reference load cell. This had been overlooked earlier. A bill of materials was also added.

The Section 508 captions for all tables and figures in the report have been updated. And TIF-quality files of each of the figures have been obtained.

AASHTO's R 32 *Standard Recommended Practice for Calibrating the Load Cell and Deflection Sensors for a Falling Weight Deflectometer* has been updated and submitted. The new R 32 document was submitted for ETG review in early June, and further revisions have been made. The new R 32 procedure has been approved by some AASHTO committees and it will be balloted upon before the end of the summer.

### **Task 5 - Communications**

Plans are currently being finalized for a meeting of the FWD Calibration Center Operators in conjunction with the FWD Users Group Meeting in Colorado Springs, CO. The meeting is being scheduled for Sunday afternoon, October 5.

As noted earlier, a meeting was held on August 6 to plan the video. The meeting was attended by the Cornell ETV department, the PennDOT Calibration Center and the Cornell Local Roads Program.

It has been agreed to hold a web-based teleconference with the Technical Advisory Committee in October, sometime soon after the FWD Users Meeting. This would avoid incurring the heavy expense of travel costs for a face-to-face meeting. It appears feasible to use the FHWA Web Conferencing facilities offered by the National Highway Institute.

### **Task 6 – Software Upgrades**

A major activity during this reporting period has been upgrades of the *WinFWDCal* software. We have been making improvements in the user interface, based partly on input from the calibration operators and partly on our own initiative. In order to reduce the propensity for drift during the double integration, a number of improvements in the integration procedure have been tried. Now that the AASHTO R 32 procedure and the FHWA project report are in near final stage, we are reviewing the software to be sure its operation is consistent with the protocol.

### **Task 7 – Calibration System Installation and Training**

Data analysis we did on data provided by the Montana DOT calibration center led to their decision to rehabilitate their test pad. We will revisit the Montana center after the rehab is completed.

The CalTrans calibration facility is currently under construction on the University of California, Davis campus, about 10 miles west of Sacramento. Completion of the building has been delayed. Equipment for the new facility has been ordered and received. We will visit the site to deliver and install the calibration equipment and train the operators after the building has been accepted.

We are also working with the Australian Road Research Board (ARRB), whose function is comparable to the FHWA Turner-Fairbank Highway Research Center, to assist them with setting up two new FWD calibration centers in Melbourne and Brisbane. A second set of calibration equipment has been delivered to the Dynatest, Florida calibration center which they plan to use to market calibration services to customers. (These activities are not part of the Task Order, nor is the time expended charged to the project. They are reported here for the sake of completeness.)