

Progress Report

TPF-5(039) Task Order #1	Falling Weight Deflectometer (FWD) Calibration Center and Operational Improvements												
Principal Investigator: Dr. Lynne H. Irwin (607) 255-8033 LHI1@cornell.edu		Agency: Cornell Local Roads Program Cornell University 416 Riley-Robb Hall Ithaca, NY 14853											
Reporting Period: September 1, 2008 through March 31, 2009													
Project Status:													
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Activity during the reporting period

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

- Providing technical support to the FWD Calibration Centers.
- Conducting quality assurance visits at several calibration centers.
- Establishing two new FWD calibration centers in California and at the Australian Road Research Board.
- Training personnel from AMRL (Asphalt Materials Reference Laboratory) on conducting QA visits in preparation for that agency to take over the QA responsibility after the end of the pooled fund study contract.
- Conducting an on site FWD calibration for Hawaii DOT and FHWA.
- Updating the *WinFWDCal* software and preparing for the release of version 2.0.
- Filming and editing a video about FWD calibration.
- Preparing for a web meeting of the Technical Advisory Committee in April 2009.

Activity by Task

Task 1 – Operations Manual

Task 1 has been given a low priority and put on indefinite hold pending further developments with other, related, FHWA-sponsored projects that are on going.

Task 2 – Technical Support

During the reporting period quality assurance site visits were conducted at the Caltrans, Indiana DOT, Pennsylvania DOT, and Foundation Mechanics, Dynatest, and Main Roads Western Australia calibration centers. All centers passed the reviews, and operator certifications were issued.

At the request of FHWA Central Federal Lands we performed an on site calibration of the Hawaii DOT FWD in Honolulu, HI in early December. This offered a good opportunity to test our procedure for on site calibration, and it was very successful. The only difficulty encountered was finding a suitable test area that provided a good range of deflections. Several garage-like outbuildings were tested, but their floors were either too stiff or too soft. We finally selected a breezeway near the main building that was covered and had the desired deflections (see photo).



Technical support was also provided through a series of telephone calls. We assisted the Caltrans, Colorado, Indiana, Minnesota, Montana, Pennsylvania, Dynatest, and Foundation Mechanics calibration centers.

The Montana center elected to rebuild their test pad to improve its deflection response. We provided input for their construction specifications, and advice on how to evaluate the new test

pad after it is in place. We provided similar assistance to the Caltrans Center that is located on the campus of the University of California at Davis.

The Colorado Center assisted us with evaluation of the new version of *WinFWDCal* software. The Indiana Center wanted to certify two calibration technicians remotely, without a site visit. We found that a site visit would be necessary.

The Minnesota Center reported problems with electrical noise that hampers calibrations during normal working hours (7:00 am – 5:00 pm), but it is not a problem in the evenings. The center operator (Dave Bullock) is working with people from the Univ. of Minnesota in an effort to diagnose and solve the problem. We have offered a number of suggestions, but the "sure cure" would be to use the alternate calibration site that is already available at the MinnRoad facility.

Task 3 – Video Production

Cornell's Media Services group did on site filming of the storyline at the PennDOT Calibration Center in September and at Cornell in October. Editing of the raw footage into an 11-minute draft video followed, and the draft was sent to key FHWA people in early December.

A number of changes in the video were requested, along with a somewhat confusing request for a Section 508 narrative that was quite different from the closed captioning we had planned to provide. We requested from FHWA some examples of the 508 narrative to help define what was needed. This has been difficult to provide. The latest information we have is that no examples can be found.

The project has been on hold since January, while waiting for information and due to other, higher priority project urgencies.

Task 4 – Documentation

FHWA Report No. FHWA-HRT-07-040 was completed and submitted to FHWA on March 8. The title of the report is *FWD Calibration Center and Operational Improvements: Redevelopment of the Calibration Protocol and Equipment*. It is posted on the Pooled Fund website at <http://www.pooledfund.org/projectdetails.asp?id=28&status=4>.

The draft report was originally submitted in April 2007. The March 8, 2009 version features an extensively re-written text along with new appendices on special procedures for on site FWD calibration, version 2 of the AASHTO PDDX Standard, and procedures and checklists for performing quality assurance reviews of the calibration centers. A complete set of drawings for the reference load cell was also added.

The AASHTO R 32 *Standard Recommended Practice for Calibrating the Load Cell and Deflection Sensors for a Falling Weight Deflectometer* was approved by the Subcommittee on Materials in late January. R 32-09 will be published in the 2009 *AASHTO Standard Specifications* book.

Task 5 - Communications

A meeting of the FWD Calibration Center Operators was held on Sunday, October 5, 2008 in conjunction with the FWD Users Group Meeting in Colorado Springs, CO. Minutes of the meeting have previously been distributed to all participants.

A web-based meeting of the Technical Advisory Committee has been scheduled for April 13, 2009 from 1:30 – 3:30 pm EST. The draft agenda for this meeting has been distributed to all participants.

Task 6 – Software Upgrades

A major activity during this reporting period has been the development of Version 2 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. Our main focus has been on the Setup procedure, converting that to a sequential set of steps so that important input is not skipped or overlooked.

In order to reduce the propensity for drift during the double integration, a number of improvements in the integration procedure have been tried. A new method for defining the zero offset due to Earth gravity before each drop has been incorporated. Refinements in the way that the onset of rise of the pulse is defined have been made.

Since September we have been working with the Colorado Calibration Center to beta-test Version 2 while we make on going changes and additional improvements. This has been very helpful, and we want to thank the Colorado Center for their assistance.

Task 7 – Calibration System Installation and Training

Two new calibration centers were established during the reporting period. One is located on the campus of the University of California at Davis and it is hosted by Caltrans. The other is located in Melbourne, Australia and it is operated by the Australian Road Research Board. The latter is not part of the pooled fund study, but it is reported here for completeness.

Both activities were entirely successful, and calibration operator certificates were issued at both locations.