LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE

For The Technical Direction Of The LTPP Program

Program Area: Monitoring

Directive Number: FWD-3

Supersedes: SHRP Directives FWD-5 and FWD-12

Date: September 16, 1993

Subject: Deflection Monitoring Frequency, Priorities, and Use of FWDs Owned by Other Agencies

This directive documents the nominal deflection testing frequency for all LTPP test sections, the priorities to be considered when all required deflection testing cannot be completed, and the technical requirements which must be addressed when FWDs belong to other agencies (State or Provincial highway agencies, or private firms) are used in LTPP deflection testing.

A. Testing Frequency

1. The nominal frequency for routine deflection monitoring on Long Term Pavement Performance (LTPP) test sections shall be as follows. Where a given test section is included in more than one of the categories outlined, the maximum testing frequency applies.

LTPP Experiment/Program	Nominal Testing Frequency	Remarks
GPS	Every 5 years	Approximately 1/5 of all test sections to be tested in any one year.
SPS-1, -2, -5, -6, -7, -8, and -9	Annual	
SPS-3 and -4	Biannual	
Seasonal Monitoring - sites which freeze	14 times/year	Twice per month during thaw period, monthly otherwise.
Seasonal Monitoring - sites which do not freeze	Monthly	

2. Pre-, during-, and post construction testing for SPS projects is to be conducted in accordance with the applicable guidelines provided in the **Manual for FWD Testing in the Long Term Pavement Performance Study, Operational Guidelines Version 2.0 (February 1993).**

3. Deflection testing on base and subgrade layers for SPS-1, -2, and -8 is to be conducted as directed in Directive S-4.

4. Pre-construction or terminal testing is to be conducted on any section which is to be modified (overlaid, reconstructed, etc.), whether it will continue as an LTPP test section or not. Where feasible, this testing should be conducted not more than three months prior to construction. Where this is not feasible, testing up to one year prior to actual construction will suffice.

B. Priorities

Where resource limitations prohibit completion of all planned deflection testing, the following order of precedence shall be followed in setting priorities.

Priority Level	Type of Testing	Remarks
1	Pre-, and during-construction testing (excluding P-59) for SPS experiments	Testing must be completed within the applicable time constraints.
1	Seasonal monitoring of sites which have been instrumented	Testing must be completed within the applicable time constraints, unless weather conditions make it impossible or unduly hazardous to do so. Testing of seasonal monitoring sites which have not been instrumented is not required.
1	Pre-construction or terminal testing for any section (GPS or SPS) which is to be modified.	Testing must be completed within the applicable time constraints.
2	P-59 testing during SPS-1, -2, and -8 construction	Testing may be omitted if it is infeasible or impractical due to logistics or lack of equipment.
2	Post-construction testing for SPS experiments,	Testing may be postponed if absolutely necessary, but must be completed within six months of the specified time.
3	Long term monitoring of GPS and SPS sites	Testing may be postponed up to one year. Priorities for "catching up" shall be based on section condition (most rapidly deteriorating sections tested first) and travel efficiency.

C. Use of Falling Weight Deflectometers (FWDs) Owned by Other Agencies

All FWDs used to obtain deflection data intended for entry into the LTPP IMS shall meet the

following conditions. No exceptions shall be made. Note that this Directive addresses only technical requirements. In certain situations, additional contractual requirements may also apply.

The FWD owner shall furnish a calibration report demonstrating that the FWD has been fully, properly, and successfully calibrated in accordance with the SHRP FWD Calibration Protocol within the 14-month period preceding the date of testing. The report shall be kept on file in the Regional Coordination Office.

2. The FWD owner shall furnish evidence that relative calibration has been performed on the FWD, in accordance with the procedure provided in the SHRP FWD Calibration Protocol, within the 35-day period preceding the date of testing, and that the resulting relative gains have been properly entered in the FWD data acquisition software.

3. The FWD load pulse rise time shall be in the range of 10 to 20 msec., and the pulse duration shall be in the range of 25-35 msec.

4. The FWD data acquisition software shall: (1) allow all procedures (including automated data checks) outlined in the **Manual for FWD Testing in the Long Term Pavement Performance Study, Operational Guidelines Version 2.0 (February 1993)** to be followed; and (2) produce a data file compatible with LTPP data processing software and filter programs for FWD data.

5. The operator of the FWD shall understand, and comply with all aspects of the procedures outlined in the applicable LTPP Program documentation (e.g., **Manual for FWD Testing in the Long Term Pavement Performance Study, Operational Guidelines Version 2.0 (February 1993)** and **LTPP Seasonal Monitoring Data Collection Guidelines**.)