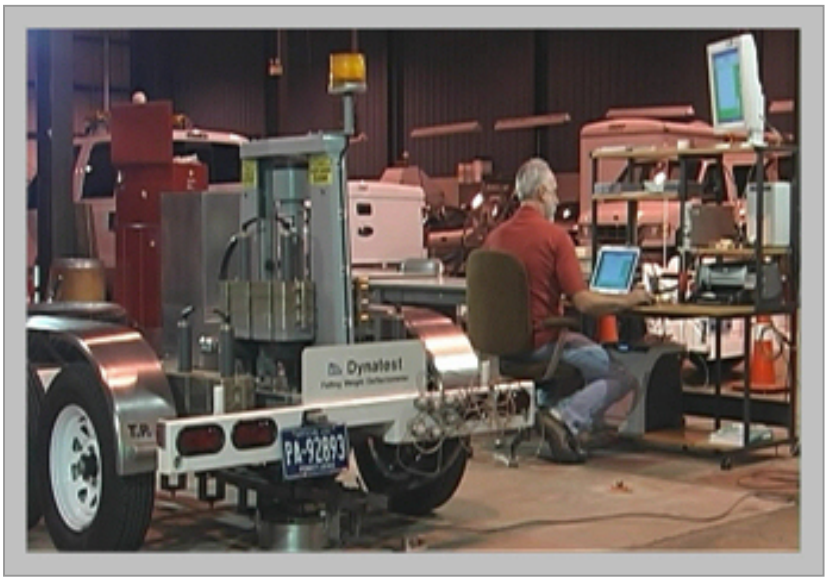
FALLING WEIGHT DEFLECTOMETER CALIBRATIONS

Technicians Performing an FWD Calibration at PennDOT's FWD Calibration Center

In order to ensure consistency and continuity in the data between different Falling Weight Deflectometer (FWD) devices, calibration centers and a set of standardized calibration procedures are required.



The Strategic Highway Research Program (SHRP), which was established by Congress in 1987, and is continued by the Federal Highway Administration (FHWA), established four regional FWD calibration centers. SHRP also developed standardized procedures for FWD calibration, which have since been adopted by the American Association of State Highway and Transportation Officials (AASHTO).

Load Cell Calibration

The center for the North Atlantic Region is located at the BOMO Annex facility, and has been in operation since 1992. Twenty to thirty calibrations are performed at the center annually. State and Federal agencies, as well as private vendors, travel from as far as North Carolina and Canada to have FWD devices calibrated. Devices are typically calibrated on an annual basis.

One person is needed to perform calibrations; a permanent Roadway Programs Specialist operates the center for RITU.

The calibration center is a cement concrete pad constructed over subbase and subgrade materials with known and constant properties. Therefore, the deflection of the pad under a given load is constant. Once the load dropped by the FWD has been properly calibrated, the deflection and load transducers from the FWD can be calibrated individually against this reference. This procedure is called “reference calibration.”

The calibration of the FWD deflection sensors is further refined by comparing them to each other in a process referred to as “relative calibration“.

The calibration procedures result in calibration factors, which are entered into the FWD software as multipliers. When the FWD measurements are multiplied by the calibration factors, the result is a measurement which has been corrected to agree with the calibration instrumentation. Data from the calibration tests is collected and stored on a computer at the calibration center, and can be compiled and plotted through various types of output programs and graphs.

Historical records of equipment, calibration dates, and results are maintained at the calibration center.