

Technical Advisory

Calibrating Effects

Calibration and its effects on testing and the world of acceptance is everything.
Well, almost everything.

Procedural tests are run and materials are subjected to various testing requirements that will either pass or fail a defined specification of what is considered to be satisfactory for a given material. These test results are used in acceptance or rejection of materials and represent a large portion of the project.

The decision to accept or fail a test will carry a great deal of weight and risk that represents a large amount of funds for all parties on the project. It could be said that the acceptance of the test really stands for nothing without the confidence in the equipment first. Calibration and Verification of the equipment is the foundation of good test results and ultimately accepting and incorporating materials on a project.

Without the confidence in the equipment the test results would be negated and ultimately disputed in any resolution or legal environment.

Not all standards are equal

The rule of thumb is a calibration standard must be NIST traceable. If you do not have NIST traceable standards then you have an uncertainty of error that is not quantifiable and would negate any confidence in the standard. For example, the Calibrator (see photo) is intended to calibrate the air meter. However, being it is not NIST traceable, it should only be used as a verification device in the field to verify it is working properly but not for actual “calibration”.

The exception would be when a primary standard is available. This is a standard based on known laws of physics. The mercury manometer is a primary standard because it only depends on the density of mercury, which doesn’t change; where as a digital manometer has manifolds and pressure sensitive equipment that can be subjected to fault and produce erroneous results.

In this case, the digital manometer would need to be verified against either a NIST traceable standard digital manometer or a primary standard mercury manometer.

Fortunately, there are governing documents that require and define calibration requirements and intervals for the equipment. However, this in itself does not ensure or guarantee the testing equipment is operating as intended. A few things that could influence or skew the results could be wear and tear, movement, or the environment the testing equipment is in.



Rendering of the calibrator

Moving Forward

The sheer size of TxDOT's calibration needs requires a three-man team and communication with the districts to logistically keep the state in compliance; all the while documenting and ensuring the confidence in the final acceptance results, which ultimately represents TxDOT and the agency's reputation for producing high quality roads.

What can our laboratory do to cover the calibration requirements of our district?

- Maintaining an up-to-date list of equipment that includes newly purchased equipment.
- Communicating with MTD Calibration on equipment, before purchasing, already purchased, or moving equipment to another location.
- Communicating with MTD Calibration on "any" changes that may affect scheduling and testing procedures.
- Communicating the calibration schedule with the AO, Maintenance Yards, Hot-Mix/Asphalt Plants, or anyone included on the equipment list to ensure they are prepared for the visit.
- Asking questions and being involved and aware of your lab's equipment requirements.
- Being accessible to help locate equipment.
- Properly maintaining all equipment.
- Working areas encompassing equipment shall have easy access and be kept clean.
- Placing equipment not being used as out of service (OOS) until ready to be used; then verification by the District Lab using calibrated equipment, and adding back into service.

Changes

- Pursuing ISO 17025 accreditation for the central laboratory.
- Regionalization plan
- Current training and certification for the MTD Calibration staff.
- State of the art equipment and references to comply with standards of calibration.
- Using SiteManager for equipment inventory and to track intervals.
- Training and implementation for statewide use.
- Procedural revisions to the 900 series and IHCP.
- Template updating to reflect current standards that are available through SharePoint.
- Equipment maintenance log (EML) worksheets are available upon request from MTD.



Helpful Resources

[Quality System Program](#)

[900-K, Calibration Series](#)

[In-House Calibration Procedures \(IHCP\)](#)

Support Contacts

General Correspondence regarding calibration to entire team.

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