



# **FWD Calibration Center Operator Certification Program**

## **Program Requirements**

**December 2011, Revision 1**

AMERICAN ASSOCIATION OF  
STATE HIGHWAY AND  
TRANSPORTATION OFFICIALS

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## 1. **Introduction**

AASHTO re:source was established in 1965, under the sponsorship of the AASHTO Highway Subcommittee on Materials. AASHTO re:source is part of the Engineering and Technical Services division of AASHTO (American Association of State Highway and Transportation Officials), an international leader in setting technical standards for all phases of highway system development. AASHTO represents all fifty states, Washington D.C. and Puerto Rico and serves as a liaison between the state departments of transportation and the federal government. AASHTO re:source's primary vision is to be the center for promoting quality and achievement of excellence in construction materials testing.

The Falling Weight Deflectometer (FWD) calibration procedure ensures that pavement analysis and deflection data is accurate and repeatable. The calibration system was developed in the early 1990s as part of the Strategic Highway Research Program's (SHRP) Long Term Pavement Performance (LTPP) program. Calibration center operator certification was initiated in 2004 as part of a pooled fund study by the Federal Highway Administration (FHWA). The Cornell Local Roads Program at Cornell University developed the certification program and operated it from 2004 to 2010. The transition of the certification program from Cornell to AASHTO re:source took place in 2010 with oversight from the FHWA. The FHWA and Cornell Local Roads Program continue to provide oversight, guidance, and technical support for the program.

### **Additional Information**

The AASHTO re:source website at <http://www.AASHTOresource.org> contains additional detailed information on the FWD Calibration Center Operator Certification Program, including contact information and supporting documents.

### **Process Workflow**

Appendix A provides a flow chart summarizing the process of obtaining certification through the AASHTO re:source FWD Calibration Center Operator Certification Program. The sections that follow describe detailed processes and policies.

## 2. **Certification Criteria**

### **On-Site Evaluation**

To establish or renew certification, calibration center operators must undergo an on-site evaluation by AASHTO re:source as described in *Section 6*. All observations and nonconformities noted in the evaluation report must be resolved as described in *Section 7* and *Section 8*.

### **Frequency of Evaluations**

To maintain current certification, on-site evaluations shall be performed at an approximate interval of 12 months. The frequency of the on-site evaluation shall not exceed 14 months. Once the date of the initial evaluation is scheduled, a reasonable attempt will be made to keep the evaluations within the same month each year. If the evaluation does not take place within the regularly-scheduled month for a particular calendar year, it is expected that the evaluation will take place on the regularly scheduled month the following calendar year. (This could reduce the frequency between two consecutive evaluations to ten months in some instances.) A schedule indicating the expected month of evaluation for each center currently in the program is available at <http://www.AASHTOresource.org>.

### **Fees**

In order to maintain current certification, all applicable fees as described in *Section 11* must be paid in full.

### **Load Cell Calibration**

Reference load cells used by the calibration centers shall be calibrated on an annual basis as described in AASHTO R 33, *Calibrating the Reference Load Cell Used for Reference Calibration for Falling Weight Deflectometer*. The calibration must be performed by a laboratory accredited to ISO 17025 in the area of force calibration. Records to indicate that all load cells used by the facility have been calibrated must be presented during the evaluation. The calibration record must include an estimate of measurement uncertainty at a confidence interval of 95%.

### **3. Certification Decisions**

AASHTO re:source uses a Management Council approach in reaching decisions on FWD Calibration Center Operator certification. AASHTO re:source acts as the technical advisor in compiling all necessary information resulting from the on-site evaluation and communication from the calibration center. The certification decision is made by the Chair, AASHTO re:source Administrative Task Group (ATG) of the AASHTO Highway Subcommittee on Materials, who has been designated by the Subcommittee to act as a Management Council for the FWD Calibration Center Operator Certification Program. All certification decisions are confined to those matters specifically related to the certification of the operators being considered.

#### **4. Scheduling of On-Site Evaluations**

##### **Initial Evaluation**

To obtain initial certification for a calibration center operator, the facility must complete and submit an FWD Evaluation Request Form to AASHTO re:source by fax, email, or postal service. A copy of the FWD Evaluation Request Form can be found on AASHTO re:source's website at <http://www.AASHTOresource.org>. Once the request has been received, AASHTO re:source staff will contact the facility's manager to determine the date for the on-site evaluation. An announcement letter confirming the date, operators to be evaluated, and other pertinent information will be emailed to the facility.

##### **Renewal of Current Certification**

AASHTO re:source staff will contact the facility's manager approximately two months before the anticipated evaluation date. The facility's manager will be asked to send in an FWD Evaluation Request Form to AASHTO re:source by fax, email, or postal service. A copy of the Evaluation Request Form is found on AASHTO re:source's website at <http://www.AASHTOresource.org>. Once the request has been received, AASHTO re:source staff will contact the facilities manager to arrange the date and time for the on-site evaluation. An on-site evaluation date must be agreed upon by AASHTO re:source and the facility's manager no less than one month before the anticipated evaluation date. A reasonable attempt is made to maintain an evaluation frequency of 12 months (see *Section 2*). The evaluation must be completed no later than 14 months after the last evaluation. An official announcement letter confirming the evaluation start date, operators to be evaluated, and other pertinent information will be sent to the facility.

##### **Cancelling or Rescheduling**

Any on-site evaluation which is cancelled or rescheduled within two (2) weeks of the scheduled date may be subject to a cancellation fee as described in *Section 11*.

#### **5. Preparation for On-Site Evaluation**

##### **On the Day of the Evaluation**

In order to provide the best evaluation possible, the facility must arrange for a fully-operational FWD to be available during the on-site evaluation. In addition, all required software and calibration equipment must be available and ready for use. If significant delays result due to inadequate preparation by the facility, additional fees may be charged to the facility.

**Note**— Additional details and information may be found in a document entitled *Recommendations for Success*. This document, found at <http://www.AASHTOresource.org>, contains suggested practices that are not a required part of evaluation preparation. However, experience has shown that following the guidelines outlined in this document generally leads to a more successful evaluation.

## **6. On-Site Evaluation**

### **Literature**

The center and operator will be evaluated for compliance to AASHTO R 32, *Standard Recommended Practice for Calibrating the Load Cell and Deflection Sensors for a Falling Weight Deflectometer*. The most current published version of AASHTO R 32 will be used during the evaluation process. A copy of the current version of AASHTO R 32 must be available at the facility during the on-site evaluation.

### **Personnel Involvement**

In addition to the representative(s) from AASHTO re:source, the calibration operator(s) to be evaluated must be present for the evaluation. The calibration center must provide an additional person to operate the FWD during the calibration procedure.

### **Opening Meeting**

At the beginning of the evaluation, the calibration center operator, FWD operator, and the AASHTO re:source evaluator will meet to discuss the anticipated flow of the evaluation. This is an opportunity for the FWD calibration operator and other staff to ask questions about the evaluation, the calibration protocol, and the software and equipment.

### **Facility and Equipment Evaluation**

A brief review of the calibration center facility and equipment will be performed. This review will ensure that the equipment and facility is compliant with the calibration procedure, that the serial numbered equipment is correct, the reference devices are up to date on their calibrations, and the facility is able to perform FWD calibrations without electromagnetic interference or significant temperature changes during a typical FWD calibration.

### **Calibration Operator Evaluation**

Each calibration center operator will be evaluated to ensure conformance to AASHTO R 32 by demonstration of the calibration procedure on a working FWD. Each operator will be expected to perform the calibration independently, demonstrating proficiency in use of the calibration software and equipment.

**Closing Meeting**

At the end of the evaluation, the AASHTO re:source Evaluator will review their findings with the Calibration Operator and the Facility’s Manager during the closing meeting. The findings will be issued in the form of an Evaluation Report, as described in *Section 7*.

**7. Evaluation Report**

After the evaluation is complete, a report will be issued for each operator evaluated. The report will contain a detailed evaluation of the facility and each operator observed and will describe any findings noted during the evaluation.

**Types of Findings**

Findings will be categorized into one of three categories: *Nonconformities*, *Observations*, and *Comments*. Definitions for each type of finding can be found in *Table 1*.

**Table 1:** Types of Findings

Finding Category	Definition
Nonconformity	A finding that indicates policy or practice contrary to the requirements of AASHTO R 32 or the AASHTO re:source program requirements.
Observation	(1) A technically-related nonconformity that judgment and experience indicate is not likely to affect the calibration of the FWD; (2) A minor failure in some part of calibration documentation.
Comment	(1) Suggestions for improvement (2) Information about pending changes to AASHTO R 32, AASHTO R 33, or the AASHTO re:source program requirements (3) Specific technical information provided for informational purposes only.

**Levels of Compliance**

Any Nonconformities, Observations, or Comments will be discussed. Each operator will be found *Fully Compliant*, *Partially Compliant*, or *Non-Compliant*, based upon the type and number of findings noted during the evaluation. Guidelines for each level of conformance are given in *Table 2*. The guidelines in *Table 2* are general rules used by AASHTO re:source to determine the level of compliance of an operator. Depending upon the severity of the findings noted, and based upon the expertise and judgment of the AASHTO re:source Evaluator, these guidelines may not be followed exactly. Compliance of each operator will be determined on a case-by-case basis.

**Repeat Observations**

If a similar *Observation* is noted on two or more consecutive evaluation reports, the *Observation* may be changed to a *Nonconformity*, and the operator will be found *Partially Compliant* or *Non-Compliant*, depending upon the severity of the finding.

**Table 2: Levels of Compliance**

<b>Compliance Level</b>	<b>Definition</b>	<b>Guidelines</b>
Fully Compliant	Operator fully understands and demonstrates sound implementation of the calibration protocol and uses the calibration equipment and software appropriately.	Generally, no <i>nonconformities</i> and up to three <i>observations</i> may be noted during the evaluation. Certification may be issued after any <i>observations</i> notes have been resolved.
Partially Compliant	Operator fully understands the calibration protocol. Some necessary changes in equipment, software use, and/or implementation of the calibration protocol may be required.	Generally, one or more <i>nonconformities</i> and/or more than three <i>observations</i> are noted. Certification may be issued after these findings are resolved.
Non-Compliant	Operator does not demonstrate an adequate understanding of the calibration protocol or its implementation.	Generally, three or more <i>nonconformities</i> and/or more than five <i>observations</i> are noted. It is recommended that the Operator undergo further training before attempting to obtain certification again. A supplemental evaluation will likely be required in order for the operator to obtain certification.

**8. Resolving Nonconformities and Observations**

**Methods of Resolving Findings**

All *nonconformities* noted in the evaluation report will require that a written response be submitted before the certification process can continue. Responses shall be submitted on an FWD On-Site Evaluation Response Form to AASHTO re:source. The FWD On-Site Evaluation Response Form can be found on AASHTO re:source’s website. *Nonconformities* may be resolved by providing sufficient evidence to indicate that the finding has been

addressed. Photographs, paperwork, or receipts may be used as evidence of resolution of equipment and facility-related findings. Evidence shall be submitted as attachments to the FWD Evaluation Response Form. Procedural findings may be addressed by re-training of the operator or by other means. In some cases, procedural findings may require a supplemental On-Site Evaluation by AASHTO re:source in order to fully resolve the issue (see *Section 9*). Observations noted in the evaluation report do not require an official response to AASHTO re:source, but are still expected to be adequately resolved.

### **Submitting Responses to Findings**

Evidence of resolution of *Nonconformities* must be submitted to AASHTO re:source within thirty (30) calendar days of the issuance of the evaluation report. Responses may be submitted by fax, email, or postal service. If this deadline is not met, another full on-site evaluation may be required before certification will be issued.

### **Review of Responses**

Upon receipt, AASHTO re:source staff will review responses and will contact the facility if further information or clarification is needed. Once responses are complete, the information will be forwarded to the AM AASHTO re:source RL Administrative Task Group (ATG) for review.

### **Communication of Certification Decisions**

If certification is denied, the center will be notified of the reason for the denial and given an opportunity to respond or appeal the decision (see *Section 10*). If all responses are accepted, certification will be issued in accordance with *Section 12*. Email will be the primary form of communication for all Administrative Task Group decisions. A reply from the center that the notification was received will be requested. Certified mail will be used if the center does not respond to the email notification.

## **9. Supplemental On-Site Evaluations**

At the request of the Chair of the Administrative Task Group, AASHTO re:source evaluators may make supplemental visits to a calibration center to (1) investigate a history of not correcting previously identified evaluation findings, (2) ensure that changes in the facility's equipment and location do not affect the ability of the operator(s) to conform to the program requirements, and (3) re-evaluate calibration operators found partially compliant or non-compliant as a result of the previous on-site evaluation. Supplemental on-site evaluations will be scheduled with the facility's manager and will be completed at additional cost to the center.

## **10. Appeal Process**

If an operator is denied certification, the calibration center has the right of appeal if the center feels that the program requirements have been met. AASHTO re:source uses a two-level appeal procedure as described below.

### **First-Level Appeal**

A center may make a first-level appeal by sending explanations and supporting documentation to AASHTO re:source. The appeal and supporting documentation must be sent within thirty (30) calendar days of receipt of notice of denial. Upon receipt of an appeal, AASHTO re:source will prepare a memorandum for the Chair of the AASHTO re:source Administrative Task Group (ATG) presenting the appeal and the center's supporting documentation. AASHTO re:source will submit the memorandum and supporting documentation to the six voting members of the ATG which includes the Chair, the Secretary, and the four regional representatives for comments and recommendations. Based on all the comments and recommendations made, the ATG Chair will prepare a first-level appeal ballot for the voting members requesting that they agree or disagree with the recommendation of the Chair. Support of at least two-thirds (2/3) of the voting members of the ATG will be required to uphold the recommendation of the Chair. If the recommendation is not upheld, the opposite position will be the ruling of the ATG. The center will be notified of the decision on its appeal by certified mail, return receipt requested. Decisions will be mailed within fifteen (15) calendar days from when the decision was made by the ATG. If the appeal is denied, the notification letter will include the reason for the denial and information on the second-level appeal process that is available. If the center decides to resolve the issue, the center must provide AASHTO re:source with evidence that the finding(s) have been resolved as specified in *Section 8*. If the appeal is granted, certification will be issued as specified in *Section 12*.

### **Second-Level Appeal**

A calibration center may make a second-level appeal by informing the Chair of the Highway Subcommittee on Materials (HSOM) in writing within thirty (30) calendar days after receipt of the denial of the first-level appeal. A special review panel comprised of the HSOM Chair and three members chosen by the HSOM Chair from the HSOM will be established to hear the second-level appeal. Members of the ATG who participated in the first level appeal are not eligible for membership on the panel. The center will be notified in writing of the appeal hearing time. At the discretion of the HSOM Chair, the hearing may be either a face-to-face meeting or a telephone conference call between the panel and the calibration center representative. The hearing will be held within forty-five (45) calendar days of receiving the notice of the second-level appeal. Travel expenses for panel members participating in the appeal hearing will be covered by AASHTO re:source, while the center will be responsible for its expenses related to the hearing. Following the hearing, AASHTO re:source, in consultation with the HSOM Chair, will ballot the panel. On the ballot, the panel will vote to either support

or deny the appeal. Support by at least three members of the panel will be required to grant the appeal; otherwise, the appeal is denied. The center is notified of the decision on its second-level appeal within thirty (30) calendar days of the hearing by certified mail, return receipt requested. If the appeal is denied, the center may decide to resolve the issue. To resolve the issue, the center must provide evidence that the finding(s) have been resolved as specified in *Section 8*. If the appeal is granted, certification will be issued as specified in *Section 12*.

## **11. Fee Structure**

**Note**— AASHTO Member Departments, including State and Federal Highway departments, are not subject to the fee structure described in this section.

### **Domestic Facilities**

Domestic facilities include those within the continental United States. A fee of \$1500 will be charged for the first day of an on-site evaluation, and a fee of \$750 will be charged for each day or portion of a day thereafter. A “day” is considered any amount of time up to nine (9) hours within the course of one calendar day. If an on-site evaluation extends past 9 hours of one calendar day, the center may be charged for a second day. If a supplemental evaluation is required in order to resolve nonconformities and observations as noted on the evaluation report, the fee structure as described above will be used.

### **International Facilities**

International facilities include any facility outside of the continental United States. In addition to the fees described above, international facilities may be subject to additional charges depending upon the location and any extraordinary travel costs. International facilities interested in AASHTO re:source FWD Calibration Center Operator Certification should contact AASHTO re:source staff for specific details and a cost estimate for services.

### **Cancellation Fee**

Any facility that cancels or reschedules an on-site evaluation within two weeks of the scheduled visit date may be subject to a cancellation fee of \$500 to offset costs associated with administrative processing and cancellation of travel plans.

### **Invoicing**

The facility will receive an invoice for services rendered, as specified above, within thirty (30) days of the on-site evaluation. Certificates will not be issued until all invoices have been paid in full. Certificates will be issued within fifteen (15) days of receipt of payment.

## **12. Certificates**

### **Issuance**

Certificates will be issued following an on-site evaluation, resolution of all findings as described in *Section 6* and *Section 7*, and receipt of payment on all invoices. Calibration operator certificates will include the full name of the operator, the date of issuance, the name and location of the calibration center, and expiration date of the certification. The certificate will be signed by AASHTO's Executive Director and the Chair of the AASHTO Highway Subcommittee on Materials (HSOM). An example certificate may be found in *Appendix B*.

### **Distribution**

An original copy of all certificates will be mailed to the facility upon issuance. An electronic copy of the certificate will be made available on AASHTO re:source's website at <http://www.AASHTOresource.org>. A list of certified operators will be maintained as described in *Section 13*.

## **13. Directory**

AASHTO re:source maintains a listing of certified FWD calibration center operators containing the following information:

- a) Name of Operator
- b) Name and Location of Calibration Center
- c) Evaluation Date
- d) Expiration Date
- e) Electronic Copy of Certificate

A current list of certified operators is maintained on AASHTO re:source's website.

## **14. Withdrawal of Certification**

A facility may choose to withdraw certification of their calibration center operators at any time. Requests for withdrawal of certification must be made in writing to the AASHTO re:source Manager. Refunds will not be provided for services already rendered.

## **15. Certification Location**

Certification is issued for individual operators and is not site-specific. An operator is considered certified to perform FWD calibrations by AASHTO re:source regardless of location. If an operator leaves a calibration center to work at another, a new on-site evaluation is not required.

While certification is not site-specific, adequate facilities and calibration equipment are an important component of successful FWD calibration. During the on-site evaluation, operators will be expected to demonstrate competency regarding the condition of the location in which

the calibration is performed, as described in AASHTO R 32. A review of the facilities in which the calibration is demonstrated will be a significant component of the on-site evaluation. Delay, denial, or revocation of certification of all operators at a particular location may result if the facilities or equipment used to demonstrate the on-site evaluation are deemed inadequate or unsatisfactory.

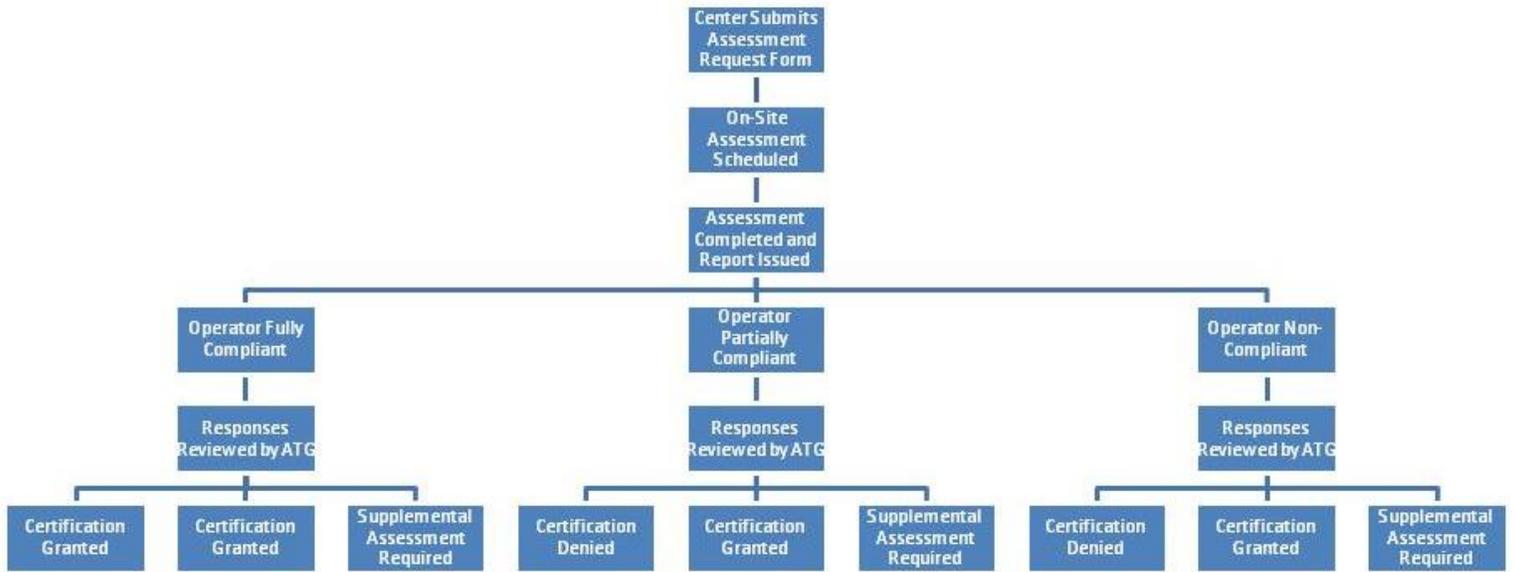
## **16. Conduct and Ethics**

AASHTO may choose to revoke certification for any center or individual operator that engages in unethical practices, including, but not limited to, falsification of records and data. AASHTO reserves the right to investigate claims of unethical practices to determine if revocation of certification is necessary. Refunds will not be provided for services already rendered.

## **17. Confidentiality Policy**

The only information shared by AASHTO re:source regarding FWD calibration centers and operators is that which can be found on the calibration certificate and online directory as described in *Section 12* and *Section 13*. All other information obtained during on-site evaluations, as well as all other correspondence with AASHTO re:source, will not be shared with any third party without explicit written permission from the calibration center or operator, as applicable.

**Appendix A, FWD Calibration Operator Certification Workflow**



**Appendix B, FWD Calibration Center Operator Example Certificate**

