

**VERMONT AGENCY OF TRANSPORTATION**

# **QUALIFIED LABORATORY PROGRAM**

William E. Ahearn, P.E.  
Materials and Research Engineer



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# VTrans Qualified Laboratory Program

## 1.0 APPLICABILITY

The Qualified Laboratory Program does not apply to the Agency's Central Laboratory, located in Berlin, VT, which is accredited by AASHTO Materials Reference Laboratory (AMRL)

This program does apply to all other Agency, Consultant, and Producer or Contractor laboratories in which acceptance sampling and testing activities are performed.

## 2.0 PURPOSE

The purpose of the Qualified Laboratory Program is to ensure that all laboratory sampling and testing equipment associated with acceptance sampling and testing procedures is maintained in proper working order and good condition.

## 3.0 DEFINITION OF A QUALIFIED LABORATORY

A laboratory is considered to be a qualified laboratory if it is in compliance with all pertinent facility requirements detailed in the current edition of the Vermont Agency of Transportation's Standard Specifications for Construction **and** meets at least one of the following criteria:

1. **(QL1)** The laboratory is an AASHTO accredited laboratory, **or**
2. **(QL2)** The laboratory complies with and maintains certification through the NorthEast Transportation Training and Certification Program's (NETTCP) Laboratory Certification Program, **or**
3. **(QL3)** The laboratory is a not AASHTO accredited but agrees to be inspected by the Agency. In addition, the laboratory must maintain compliance with Section 6 of the 2008 edition of AASHTO R-18 - Standard Recommended Practice for Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories. There are two exceptions; 1) calibration requirements for HMA and Concrete Producers equipment is limited to only those pieces of equipment included in the Appendices and 2) the calibration interval for HMA and Concrete Producers equipment is 12 months.

Each qualifying laboratory is assigned a qualified laboratory designation of either QL1, QL2, or QL3 depending upon the above qualification criteria.

## 4.0 GENERAL REQUIREMENTS

In accordance with Section 4, qualified laboratories are expected to have all equipment necessary to conduct acceptance sampling and testing. This equipment shall be adequately maintained and calibrated. In addition, accurate records shall be maintained for a minimum period of 7 years. Equipment calibration records shall be kept in a clearly defined location within the laboratory at all times.

Qualified laboratories agree to be subjected to an annual initial inspection and thereafter at unspecified and unannounced intervals as specified in Section 5. Qualified laboratories shall designate one individual to act as the Laboratory Manager. The Laboratory Manager is someone who has overall

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responsibility for the technical operations of the laboratory. Qualified laboratories should also nominate a designee to serve in the Laboratory Manager's absence. For Agency Laboratories the Laboratory Manager has been determined to be the Paving Engineer (Bituminous Core Lab) and the Regional Construction Engineers (Regional Agency Materials Laboratories).

Qualified laboratories must correct any deficiencies encountered during any prior inspection, in accordance with Section 6 of this document.

### **4.1 Facility Requirements and Equipment Inventory**

As stated earlier, a qualified laboratory must comply with all pertinent facility requirements as detailed in the current edition of the Vermont Agency of Transportation's Standard Specifications for Construction. In addition, the laboratory facility must adequately house and allow for the proper operation of all required testing equipment in accordance with applicable test procedures.

All laboratories which are determined qualified based on Section 3.0 must ensure that their laboratory facilities are in continuous conformance with the applicable requirements of this document. As determined by the Agency or NETTCP, a laboratory found to be in noncompliance with the above requirements may have its Qualified Laboratory status suspended.

### **4.2 Equipment Calibrations**

All testing equipment shall be calibrated in accordance with the applicable AASHTO, ASTM, or AOT-MRD specification for each acceptance test procedure conducted in the laboratory. Any equipment calibrations that cannot be performed by laboratory personnel shall be performed by an external calibration service using standards traceable to the National Institute of Standards and Technology (NIST). Qualified laboratories must maintain compliance with Section 6 of the 2008 edition of AASHTO R-18

The laboratory shall also maintain, and make available for review, a current equipment list documenting the frequency of their equipment calibrations, similar to Appendix A and/or B.

### **4.3 Reference, Records, and Documentation Management**

Each qualified laboratory must maintain current laboratory reference manuals, which contain applicable AASHTO, ASTM, and AOT-MRD standard testing procedures. These reference manuals shall also include VTrans policies for the handling, identification, conditioning, storage, retention, and disposal of test samples for all tests performed.

The management of laboratories where acceptance sampling and testing is performed shall maintain records of equipment calibrations and verifications in accordance with AASHTO R-18 Section 6.0. Qualified laboratories shall maintain, and make available for review, documentation of all calibration records for a minimum of 7 years.

See Appendix C for an example of an acceptable calibration/verification record. Calibration and verification records of all testing equipment should include the minimum information:

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- a. The name and location of the laboratory.
- b. The item calibrated.
- c. The name of the manufacturer.
- d. The model number and serial number or identifying number of the equipment.
- e. The person performing the calibration.
- f. The standard used to calibrate the equipment and its serial number.
- g. The required frequency of the calibration.
- h. Date last calibrated
- i. Date of the current calibration.
- j. The next calibration due date.
- k. Measured results.
- l. Specified tolerances.
- m. Adjustments made to the equipment and the end result.
- n. Indication of compliance or noncompliance with the appropriate test method.

**If providing acceptance test results to the Vermont Agency of Transportation then all acceptance test results shall be recorded and reported using forms acceptable to the Vermont Agency of Transportation.**

The laboratory shall maintain a record of all laboratory evaluations performed by VTrans, including appropriate follow-up corrective actions taken to resolve any deficiencies.

### 5.0 AGENCY INSPECTIONS

#### 5.1 Laboratory Inspection Request

The initial laboratory inspection shall be performed before acceptance sampling and testing activities are conducted within the laboratory and/or prior to production. The annual initial laboratory inspection must be requested by the Qualified Laboratory's Laboratory Manager in writing to the Agency's Materials & Research Engineer at least 30 days prior to production. The request shall include a current equipment inventory. The request shall also include assurances the laboratory has all of the necessary equipment and that all of this equipment has been calibrated and is in good working condition. This request shall include the name of the person who will fill in for the Laboratory Manager if absent during the date of the inspection.

The laboratory inspection will be scheduled within 10 working days of receipt of the laboratory inspection request. The laboratory inspection will be conducted within 30 days of the receipt of the laboratory inspection request.

#### 5.2 Frequency of Agency Inspections

The Agency will perform an annual initial inspection to determine that the laboratory is in compliance with the Agency's Qualified Laboratory Program.

In addition, the Agency will perform a minimum of one unannounced, random Independent Assurance review of each active laboratory every year.

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### **5.3 Distribution of the Inspection Report**

Laboratory inspection reports will be sent directly to the Laboratory Manager within 10 working days after the date of the inspection. Copies will also be distributed to the Agency Technician performing the inspection and the Agency's Certification and Independent Assurance Unit.

### **6.0 CORRECTIVE ACTIONS**

Any deficiencies found during the laboratory inspection(s) will be documented in the Laboratory Inspection Report. The Laboratory Manager will have 5 working days to propose a schedule for correction. Unless otherwise approved by the Materials & Research Engineer, the Laboratory Manager will have no more than 10 working days from the date of the receipt of the report to correct the deficiencies.

The Laboratory Manager will provide written notice to the Materials & Research Engineer of the corrective actions initiated and the steps taken to prevent reoccurrence of the deficiency. If in the judgment of the Agency the evaluation of the condition and working order of the equipment is such that the acceptability of the material can not be dependably determined, qualification of the laboratory may be suspended until a corrective action plan has been developed and implemented by the Laboratory Manager.

### **7.0 NON-COMPLIANCE**

This section applies to qualified laboratories designated as QL2 and QL3 that are determined to be in non-compliance with Section 3.0 or 4.0.

If the identified deficiencies are not corrected within 30 days, the laboratory's qualification status will be revoked. The Agency shall notify the affected laboratory, and if applicable, forward a letter of explanation to NETTCP, detailing the reason(s) for revocation of the NETTCP certification. NETTCP shall amend its records within 5 working days after receipt of such letter. Appeals of such revocation submitted by QL2 Laboratories shall be handled by the Agency and NETTCP. Appeals of such revocation submitted by QL3 Laboratories shall be handled solely by the Agency.

# **APPENDIX A**

## **Calibration Checklist for HMA Laboratory Equipment**

**Independent Assurance Hot Mix Asphalt Laboratory Equipment Verification**

Company:	
Location:	
Date Inspected:	
Inspected By:	

Title	AASHTO SPEC.	Equipment Manufacturer	Serial Number	Date last Calibrated	Calibration(C)/ Verification(V) Frequency	Next Calibration/ Verification Due Date
General Purpose Drying Oven	T 245, T 176				Max. 12 Months (V)	
Temperature Measuring Devices (Thermometers)	T 209, T 166				Max. 6 Months (C)	
Marshall Compaction Hammer (Mechanically Operated)	T 245				Max. 36 Months (C)	
Marshall Molds	T 245				Max. 12 Months (V)	
Marshall Stability and Flow	T245				Max. 12 Months (C)	
Vacuum Pump	T 209				Max. 12 Months (V)	
Balance (scale)	T 209, T 245, T 166				Max. 12 Months (V)	
SHRP Gyratory Compactor	T 312				Max. 6 Months (V) or if moved.	
Vacuum Bowl	T 209				Max. 12 Months (V)	
2 Liter Flask	T 209				Max. 3 Months (C)	
4 Liter Flask	T 209				Max. 3 Months (C)	
Mechanical Sieve Shaker (Gilson Type)	T-27				Max. 12 Months (V)	
Mechanical Sieve Shaker For 8" or 12" Sieves	T-27				Max. 12 Months (V)	

Note: The Calibration/Verification requirement is referenced from **2008 AASHTO R-18**.

Comments:

**Independent Assurance Hot Mix Asphalt Laboratory Equipment Verification**

Company:	
Location:	
Date Inspected:	
Inspected By:	

Title	Equipment Manufacturer	Serial Number	Date last Calibrated	Calibration(C)/ Verification(V) Frequency	Next C-V Due Date
<b>Sieves 8" or 12"</b>					
37.5 mm (1 1/4 inch)				Max. 6 Months (V)	
25 mm (1 inch)				Max. 6 Months (V)	
19 mm (3/4 inch)				Max. 6 Months (V)	
12.5 mm (1/2 inch)				Max. 6 Months (V)	
9.5 mm (3/8 inch)				Max. 6 Months (V)	
4.75 mm (No. 4)				Max. 6 Months (V)	
2.36 mm (No.8)				Max. 6 Months (V)	
1.18 mm (No. 16)				Max. 6 Months (V)	
600µm (No. 30)				Max. 6 Months (V)	
300µm (No. 50)				Max. 6 Months (V)	
150µm (No. 100)				Max. 6 Months (V)	
75µm (No. 200)				Max. 6 Months (V)	
Pan and cover				N/A	
<b>Sieves (Gilson)</b>					
37.5 mm (1 1/4 inch)				Max. 6 Months (V)	
25 mm (1 inch)				Max. 6 Months (V)	
19 mm (3/4 inch)				Max. 6 Months (V)	
12.5 mm (1/2 inch)				Max. 6 Months (V)	
9.5 mm (3/8 inch)				Max. 6 Months (V)	
4.75 mm (No. 4)				Max. 6 Months (V)	
Pan				N/A	

Note: The Calibration/Verification requirement is referenced from **2008 AASHTO R-18.**

Comments:

# **APPENDIX B**

## **Calibration Checklist for Concrete Laboratory Equipment**

**Independent Assurance Concrete Laboratory Equipment Verification**

Company:	
Location:	
Date Inspected:	
Inspected By:	

Title	Equipment Manufacturer	Serial Number	Date last Calibrated	Calibration(C)/ Verification(V) Frequency	Next Calibration/ Verification Due Date
8" or 12" Sieves				Max. 6 Months (V)	
9.5 mm (3/8 inch)				Max. 6 Months (V)	
4.75 mm (No. 4)				Max. 6 Months (V)	
2.36 mm (No.8)				Max. 6 Months (V)	
1.18 mm (No. 16)				Max. 6 Months (V)	
600µm (No. 30)				Max. 6 Months (V)	
300µm (No. 50)				Max. 6 Months (V)	
150µm (No. 100)				Max. 6 Months (V)	
Mechanical Sieve Shaker For 8" or 12" Sieves with adjustable timer				Max. 12 Months (V)	
Balance (scale)				Max. 12 Months (V)	

**Independent Assurance Concrete Laboratory Equipment Verification**

Company:	
Location:	
Date Inspected:	
Inspected By:	

Title	Equipment Manufacturer	Serial Number.	Date last Calibrated	Calibration(C)/ Verification(V) Frequency	Next Calibration/ Verification Due Date
Sieves (Gilson Type)				Max. 6 Months (V)	
45 mm (1 ¾ inch)				Max. 6 Months (V)	
37.5 mm (1 ½ inch)				Max. 6 Months (V)	
25 mm (1 inch)				Max. 6 Months (V)	
19 mm (¾ inch)				Max. 6 Months (V)	
12.5 mm (½ inch)				Max. 6 Months (V)	
9.5 mm (⅜ inch)				Max. 6 Months (V)	
6.3 mm (¼ inch)				Max. 6 Months (V)	
4.75 mm (No. 4)				Max. 6 Months (V)	
2.36 mm (No. 8)				Max. 6 Months (V)	
1.18 mm (No. 16)				Max. 6 Months (V)	
Pan				N/A	
Mechanical Sieve Shaker (Gilson) with adjustable timer				Max. 12 Months (V)	

Note: The Calibration/Verification requirement is referenced from **2008 AASHTO R-18**.

Comments:

# **APPENDIX C**

## **Sample Calibration/Verification Report**

**VERMONT AGENCY OF TRANSPORTATION  
MATERIALS AND RESEARCH DIVISION**

**EQUIPMENT CALIBRATION/VERIFICATION REPORT**

For: General Purpose Drying Oven - Reference: AOT In-House Procedure #4

Manufacturer: \_\_\_\_\_

Model: \_\_\_\_\_ Serial Number: \_\_\_\_\_

VAOT Identification Number: \_\_\_\_\_ AMRL Number: \_\_\_\_\_

Date Purchased/Placed in Service: \_\_\_\_\_ Location (Lab): \_\_\_\_\_

Calibration/Verification Record

Checked By: \_\_\_\_\_ Date: \_\_\_\_\_

Previous Date Checked: \_\_\_\_\_ Next Due Date (6 months max.): \_\_\_\_\_

Verification Equipment Used: \_\_\_\_\_

1. Temperature setting: \_\_\_\_\_ °C Time oven closed: \_\_\_\_\_

Reading #1 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

Reading #2 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

Reading #3 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

2. Temperature setting: \_\_\_\_\_ °C Time temperature reset: \_\_\_\_\_

Reading #1 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

Reading #2 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

Reading #3 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

3. Temperature setting: \_\_\_\_\_ °C Time temperature reset: \_\_\_\_\_

Reading #1 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

Reading #2 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

Reading #3 Time: \_\_\_\_\_ Temperature: \_\_\_\_\_ °C

4. Is temperature within the range(s) required in the appropriate test method(s)?

Remarks: \_\_\_\_\_

\_\_\_\_\_