

VERMONT AGENCY OF TRANSPORTATION
CONSTRUCTION & MATERIALS BUREAU
MATERIAL TESTING & CERTIFICATIONS SECTION



QUALIFIED TECHNICIANS
PROGRAM
Procedures

Procedures for the Qualification of Sampling and Testing Personnel

May 1, 2024

Larkin Wellborn
FHWA Field Operations Engineer

DocuSigned by:
Larkin Wellborn
01878289816F4E4...

Nick Van Den Berg, P.E.
VTrans Materials Manager

DocuSigned by:
Nick Van Den Berg
57D4DD3560C24C2...

AGENCY OF TRANSPORTATION**QUALIFIED TECHNICIAN PROGRAM****1.0 INTRODUCTION**

The Qualified Technician Program (QTP) establishes minimum training requirements necessary for staff employed by the Agency to be considered “qualified testing personnel” as referenced in the Agency’s Quality Assurance Program (QAP).

2.0 APPLICABILITY

The QTP has been developed by the Materials Testing and Certification Section for use by the entire Construction and Materials Bureau (CMB). Other Bureaus may use this document to address their needs but are responsible for administration of the QTP within their Bureau.

Agency staff and Consultant staff employed by the Agency to perform or witness acceptance sampling must be Qualified in accordance with the requirements of this program. Agency staff assigned as Independent Assurance technicians must also be Qualified.

Qualification requirements for Agency staff that are assigned as laboratory technicians within the Agency’s AASHTO accredited Laboratory(s) will be governed by the Quality Systems Manual (QSM).

All qualified staff are subject to Independent Assurance Technician Proficiency Evaluation (TPE) requirements, which is separate and distinct from this program.

3.0 AUTHORITY

Only the Agency can deem personnel to be ‘qualified technicians’.

Only external certification programs such as the Northeast Transportation Technician Certification Program (NETTCP) or American Concrete Institute (ACI) can deem personnel to be ‘certified’.

Any Qualified Agency technician can conduct the technician qualification examination (TQE) required to qualify another technician, following the procedures detailed in section 4.0.

4.0 HOW TO BECOME QUALIFIED

Qualification for Agency and Consultant staff is attained through completion of two steps;

1. Complete Agency-assigned training and,
2. Successfully pass a Technician Qualification Examination (TQE).

4.1 TRAINING

Personnel receive formal training including all applicable AASHTO, ASTM, and VTrans sampling and testing procedures with instruction on the importance of proper procedures and the significance of test results. The specific training required for each sampling or testing procedure is shown in Table 1 and Table 2.

AGENCY OF TRANSPORTATION**QUALIFIED TECHNICIAN PROGRAM**

The responsibilities of the trainee would be to:

1. Observe proper sampling and testing techniques of a qualified technician.
2. Read and understand applicable AASHTO, ASTM, and VTrans procedures.
3. Learn calculations associated with the procedures.
4. Learn how to prepare appropriate paperwork.
5. Learn applicable computer programs associated with prompt and accurate sampling, testing, and reporting.
6. Understand the importance of calibrating applicable equipment and identifying out of tolerance equipment.

4.2 TECHNICIAN QUALIFICATION EXAMINATION

Upon successfully completing all of the training requirements for a given procedure, the employee will have the opportunity to demonstrate their competency in performing that procedure through a technician qualification examination (TQE). The TQE may require hands-on demonstration, written exam, other means of examination, or any combination thereof. Examination requirements are listed in Table 1 and Table 2 below.

To become a Qualified Technician, the employee must satisfactorily complete a TQE for each of the sampling and testing procedures they will be qualified to perform. If the employee does not satisfactorily complete the TQE, the examiner will, at their discretion, either provide coaching and immediately re-examine, or schedule a subsequent TQE attempt at a later date to allow the technician time for additional training.

It is the responsibility of the examiner that is conducting this TQE to confirm that the examinee has completed all training requirements prior to examination and to record this in the TQE form. It is the responsibility of the examiner that is conducting this TQE to document the results of the examination on the appropriate form and distribute those results as indicated on the form. The completed TQE will be reported to the Independent Assurance unit to update the roster of Qualified Technicians.

All current TQE/TPE forms can be accessed at this [link](#);

An example TQE/TPE form is provided in Appendix A.
An example Employee Training Record is provided in Appendix B.

AGENCY OF TRANSPORTATION

QUALIFIED TECHNICIAN PROGRAM

4.3 TRAINING AND EXAMINATION REQUIREMENTS BY PROCEDURE

Table 1: Field Procedures

Procedure Description	Procedure Designation	Agency Training Requirement	TQE Format
HMA Field Sampling	R 97	1. LMS online , and 2a. In-person training event, or 2b. On the job training	Hands-on
HMA Coring	R 67	1. LMS online	LMS quiz
HMA Truck Sampling	R97	1. On the job training	Hands-on
Emulsion Sampling	R66	1. On the job training	Hands-on
Binder Sampling	R66	1. On the job training	Hands-on
Concrete Wet Testing	ASTM C1064, C172, C143, C138, C231, C173, C31	1. ACI Field Testing Grade 1	1. ACI Field Testing Grade 1
Concrete Spread (Self-Consolidating Concrete)	ASTM C 1611	In-person	Hands-on
Grout and Repair Material Cube Samples	AASHTO R 64	In-person	Hands-on
Flowable Fill Sampling	ASTM D 5971, ACI 229 Section 8.4	In-person	Hands-on
Aggregate Sampling	R 90	1. In-person training event, and 2a. Online TC3 , or 2b. On the job training	Hands-on
Density Testing of In-Place Aggregates	AASHTO T310, ASTM D8167	1. Online TC3, and 2. On the job training	Hands-on

Table 2: Laboratory Procedures

Procedure Description	Procedure Designation	Agency Training Requirement	TQE Format
Aggregate Testing	Various	1a. NETTCP Certification, or 1b. Online TC3 and on the job training.	Hands-on
Precast Concrete Strength Testing	Various	1. ACI Strength Testing Technician, or 2. On the job training.	Hands-on
HMA Testing	Various	1a. NETTCP HMA Plant Certification or 1b. Online TC3 and 2. On the job training	Hands-on

AGENCY OF TRANSPORTATION

QUALIFIED TECHNICIAN PROGRAM

5.0 HOW TO REMAIN QUALIFIED

To remain Qualified, a Qualified Technician must:

1. Perform sampling and testing procedures properly and proficiently.

A Qualified Technician will lose their Qualification status if;

1. Two full construction seasons (April 1 – November 15) have passed since the technician last performed the procedure. Qualification will expire on the December 31st immediately following the second season.
2. The technician is subjected to an Independent Assurance Technician Proficiency Evaluation and the result is unsatisfactory.
3. The Qualification procedure for which they are qualified has changed significantly, for example due to technical changes to the applicable AASHTO or ASTM procedure or a change to specifications.
4. The technician is found to have improperly performed acceptance sampling or testing.
5. The technician is found to be falsifying test result records and/or conducting themselves in an unethical manner that impacts sampling, testing, or the acceptance of materials.
 - a. In this case, permission to seek re-qualification must be granted by the CMB Director.

To regain Qualification status, the employee must successfully complete the applicable training and technician qualification examination as outlined in Section 4.

6.0 HOW TO CONFIRM YOUR QUALIFICATION STATUS

The Independent Assurance Unit maintains a roster of Qualified Technicians, which can be [viewed here](#);

7.0 QUALIFICATION EVENTS

Training and Qualification events, sometimes referred to as ‘rodeos’, are intended to provide one or more of the following;

1. Training that satisfies the requirements of Table 1 ‘Agency Training Requirements’ for one or more procedures
2. An opportunity for technicians to perform a TQE and become Qualified
3. An opportunity for technicians to undergo IA TPE

It is important to note that a technician cannot receive TQE and IA TPE at the same time.

APPENDIX A

Example Technician Competency

All current Technician Competency Evaluation forms can be accessed at this [link](#);

VERMONT AGENCY OF TRANSPORTATION
MATERIALS TESTING

TECHNICIAN PROFICIENCY EVALUATION
FOR
Test: Sieve Analysis of Fine and Coarse Aggregate- AASHTO T27

Technician being Evaluated: _____ Date: _____

Assessor: _____ Date: _____

PROCEDURE

Mixtures of Fine and Coarse Aggregate

Sample size the same as sample for coarse aggregates?..... _____

Fine Aggregate

Initial mass: _____ Final mass: _____

1. Sample obtained by T248 (*ASTM C702*)?..... _____
2. Minimum sample mass 300 g?..... _____
3. (Optional) If T11 (*ASTM C117*) is used, does the dry nest include a 75-µm (No. 200) sieve?..... _____
4. Sample dried to constant mass at 110±5°C (230±9°F)?..... _____
5. AASHTO: Mass determined to nearest 0.1%? _____
Note: If specimen consists of material leftover after T11 (*ASTM C117*) then Step 5 does not apply because it is assumed that total specimen mass was determined as part of that test.
6. AASHTO: Sieving continued until not more than 0.5% by mass of the total specimen passes a given sieve during one minute of continuous hand sieving?* _____
*ASTM: Sieving continued until not more than one mass % of the residue on any individual sieve passes that sieve during one minute of continuous hand sieving?** _____
Sieve size: _____ Mass retained on sieve: _____ Mass passing sieve: _____
7. Residue on each sieve weighed to 0.1% of original dry mass? _____
8. Sieves not overloaded - mass of residue on each sieve [finer than 4.75-mm (No. 4) sieves] less than 7 kg/m² of sieving surface (200 g for 8" diameter sieve)? _____
9. Total mass of material after sieving agrees with mass before sieving to within 0.3% (If not, do not use for acceptance testing)?..... _____
10. Percentages calculated to the nearest 0.1% and reported to the nearest whole number (except 75-µm - if less than 10%, percentages reported to nearest 0.1%)?..... _____
11. Percentage calculations based on original dry sample mass, including the passing 75-µm fraction (if T11/*ASTM C136* was used)? _____

Appendix A: Technician Competency

VERMONT AGENCY OF TRANSPORTATION
MATERIALS TESTING

TECHNICIAN PROFICIENCY EVALUATION
FOR

Test: Sieve Analysis of Fine and Coarse Aggregate- AASHTO T27

Technician being Evaluated: _____ Date: _____

Assessor: _____ Date: _____

Coarse Aggregate

Initial mass: _____ Final mass: _____

1. If whole field sample is not used, is test sample obtained by T248 (*ASTM C702*)?..... _____
2. Sample dried to constant weight at 110±5°C (230±9°F) or sieved surface dry?..... _____
3. AASHTO: Mass determined to nearest 0.1%?..... _____
Note: If specimen consists of material leftover after T11 (*ASTM C117*) then Step 3 does not apply because it is assumed that total specimen mass was determined as part of that test.
4. Minimum sample mass: 3/8 in. - 1 kg; 1/2 in. - 2 kg; 3/4 in. - 5 kg; 1 in. - 10 kg; 1 ½ in. - 15 kg; 2 in. - 20 kg; 2 ½ in. - 35 kg; 3 in. - 60 kg; 3 ½ in. - 100 kg?..... _____
5. If hand sieving, particles not forced to pass through openings?..... _____
6. *AASHTO: Sieving continued until not more than 0.5% by mass of the total specimen passes a given sieve during one minute of continuous hand sieving?..... _____
**ASTM: Sieving continued until not more than one mass % of the residue on any individual sieve passes that sieve during one minute of continuous hand sieving?* _____
Sieve size: _____ Mass retained on sieve: _____ Mass passing sieve: _____
7. Residue on each sieve weighed to 0.1% of original dry mass?..... _____
8. Sieves not overloaded:
 - (a) Mass of residue on each sieve [finer than 4.75-mm (No. 4) sieves] does not exceed 7 kg/m² of sieving surface (200 g for 8" diameter sieve)?..... _____
 - (b) Mass of residue on each sieve [for 4.75-mm (No. 4) sieves and larger] does not exceed 2.5 X (sieve opening, mm) X (effective sieving area, m²)?..... _____
9. Total mass of material after sieving agrees with mass before sieving to within 0.3% (If not, do not use for acceptance testing)?..... _____
10. Percentages calculated to nearest 0.1% and reported to nearest whole number?..... _____
11. Percentage calculations based on original dry sample mass, including the passing 75-µm fraction (if T11/*ASTM C136* was used)?..... _____

* Check by hand with 8-in. diameter sieve.

COMMENTS:

Appendix A: Technician Competency (continued)

APPENDIX B

Example Employee Training and Evaluation Record

