
Standard Practice for Technician Training and Certification Programs

AASHTO Designation: R 25-22¹

Technically Revised: 2022

Tech Subcommittee: 5c, Quality Assurance and Environmental



**American Association of State Highway and Transportation Officials
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1. SCOPE AND LIMITATION

- 1.1. This document provides a guideline for establishing evaluation and certification procedures for personnel engaged in sampling and testing of soils, aggregates, asphalt mixture, and portland cement concrete in accordance with AASHTO test methods. The guideline is intended for use by organizations providing certification of sampling and testing technicians at the basic testing level for acceptance of materials and independent assurance testing.
 - 1.2. The terms used in this standard regarding “technician” or “certification” are meant to be generic descriptions. The term “qualification” is equivalent to “certification” within this standard. Each state will need to use appropriate terminology consistent with state law and practices.
 - 1.3. This guideline does not purport to address all possible events and procedures inherent in the administration and use of a technician certification program (TCP).
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2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards and Publications:*
 - R 47, Reducing Samples of Asphalt Mixtures to Testing Size
 - R 76, Reducing Samples of Aggregate to Testing Size
 - R 90, Sampling Aggregate Products
 - R 97, Sampling Asphalt Mixtures
 - R 100, Making and Curing Concrete Test Specimens in the Field
 - T 11, Materials Finer Than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
 - T 19M/T 19, Bulk Density (“Unit Weight”) and Voids in Aggregate
 - T 22M/T 22, Compressive Strength of Cylindrical Concrete Specimens
 - T 27, Sieve Analysis of Fine and Coarse Aggregates
 - T 30, Mechanical Analysis of Extracted Aggregate
 - T 44, Solubility of Bituminous Materials
 - T 84, Specific Gravity and Absorption of Fine Aggregate
 - T 85, Specific Gravity and Absorption of Coarse Aggregate
 - T 89, Determining the Liquid Limit of Soils
 - T 90, Determining the Plastic Limit and Plasticity Index of Soils

- T 99, Moisture–Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-in.) Drop
- T 113, Lightweight Particles in Aggregate
- T 119M/T 119, Slump of Hydraulic Cement Concrete
- T 121M/T 121, Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- T 152, Air Content of Freshly Mixed Concrete by the Pressure Method
- T 166, Bulk Specific Gravity (G_{mb}) of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens
- T 176, Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
- T 180, Moisture–Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop
- T 196M/T 196, Air Content of Freshly Mixed Concrete by the Volumetric Method
- T 209, Theoretical Maximum Specific Gravity (G_{mm}) and Density of Asphalt Mixtures
- T 245, Resistance to Plastic Flow of Asphalt Mixtures Using Marshall Apparatus
- T 255, Total Evaporable Moisture Content of Aggregate by Drying
- T 265, Laboratory Determination of Moisture Content of Soils
- T 269, Percent Air Voids in Compacted Dense and Open Asphalt Mixtures
- T 272, Family of Curves—One Point Method
- T 283, Resistance of Compacted Asphalt Mixtures to Moisture-Induced Damage
- T 304, Uncompacted Void Content of Fine Aggregate
- T 308, Determining the Asphalt Binder Content of Asphalt Mixtures by the Ignition Method
- T 309, Temperature of Freshly Mixed Portland Cement Concrete
- T 310, In-Place Density and Moisture Content of Soil and Soil–Aggregate by Nuclear Methods (Shallow Depth)
- T 312, Preparing and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyratory Compactor
- T 329, Moisture Content of Asphalt Mixtures by Oven Method
- T 335, Determining the Percentage of Fracture in Coarse Aggregate
- T 355, In-Place Density of Asphalt Mixtures by Nuclear Methods
- *Implementation Manual for Quality Assurance*, Joint Construction Quality Assurance Task Force, 1995
- *Quality Assurance Guide Specification*, Joint Construction Quality Assurance Task Force, 1995

2.2. *ASTM Standard:*

- D4791, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

3. INTRODUCTION

3.1. *This guideline is provided to:*

- Help individual states, and where desired, combinations of states and other public agencies develop a TCP for use in conjunction with quality assurance (QA) specifications as described in the *Implementation Manual for Quality Assurance* and the *Quality Assurance Guide Specification*.
- Describe the activities and organizational needs for the development and operation of a TCP that provides an effective means for ensuring qualified personnel perform sampling and testing.

- Identify the commonly used tests performed to ascertain material or product characteristics, for acceptance and/or payment under project contracts incorporating soils, aggregates, portland cement concrete (PCC), and asphalt mixture. Examples of these tests are shown in Appendix X1.

- 3.1.1. A successful TCP requires the full support and commitment from agencies and industry that have a vested interest in technician training and certification. Involvement of those with a common interest in technician training and certification helps in understanding the multiple perspectives of the team members, and this, in turn, helps develop policies and procedures that will be supported by their respective organizations.
- 3.1.2. Development of an agreement at the program inception, and before major changes, is recommended as the best means for gaining the needed understanding and support for the program.
- 3.1.3. Consideration of reciprocal agreements between states, and where feasible, regions, regarding materials technician certification acceptance is a means of addressing economy and business process efficiencies and should be an integral part of all TCPs.
- 3.2. *Background:*
- 3.2.1. Historic roles and responsibilities of industry and agencies have changed for sampling and testing activities under QA specifications. QA specifications allow the use of contractor test results in the acceptance decision, and the use of consultants in independent assurance and verification sampling and testing programs.
- 3.2.2. Certification programs and associated training have been shown to be an effective tool for improving the quality of highways and bridges by verifying essential knowledge and skills are possessed by agency or industry personnel who monitor, inspect, and control construction operations. Certification programs for personnel have proven to be useful, common “yardsticks” for measuring expertise and performance among public transportation agencies, private construction contractors, and independent materials laboratories.
- 3.2.3. As the use of QA specifications increases, the need for TCPs as an equitable means for test result comparison and credibility between contract parties has become apparent. Each state using QA specifications should have provisions requiring the use of certified technicians involved in construction project testing and inspection activities.

4. PROGRAM ORGANIZATIONAL STRUCTURE AND MANAGEMENT

- 4.1. *Joint Sponsorship, Key to Success*—A successful TCP works best with the full support and commitment from all parties (i.e., agency and industry) that have a vested interest in technician training and certification. Developing a partnership agreement at program inception, and before major changes, is recommended as the best means for gaining needed understanding and support for a TCP.
- 4.2. *TCP Oversight Committee*—State laws and state DOTs’ policies may dictate a state or regional TCP structure, and restrictions on the language of the program charter and operation. Therefore, each state DOT should coordinate with its legal staff when developing their charter and bylaws for TCP governance and organizational structure.
- Note 1**—When developing a state or regional program whose bylaws will include rules that *require* certification, recertification, and/or provision for decertification, legal review is needed. The identification of legal restrictions and identification of the TCP charter or franchise

requirements, based on applicable state laws, will help the TCP manager and oversight committee in their duties to administer the program.

- 4.2.1. A TCP should have an oversight committee to provide TCP governance. Several alternatives are recommended for establishing an oversight committee:
- Establish a joint venture between public and private industry;
 - Have the state DOT take the lead; or
 - Have an educational institution or industry group take the lead.
- 4.2.2. Oversight committee members typically include representatives from the following areas: state DOT personnel, contractors, suppliers, producers, independent laboratories, academia, private consultants, and the Federal Highway Administration (FHWA). Because these programs will impact contract requirements, an agency manager should chair the oversight committee. Program oversight should be a joint effort of the entities represented on the oversight committee.
- 4.2.3. If the organization is a joint venture between agency and industry or between states, it may be incorporated as a nonprofit organization in order to receive and disburse funds on a regular basis.
- 4.3. *TCP Manager*—The oversight committee should identify a TCP manager as a single contact point. The TCP manager may coordinate training activities (e.g., course development and curriculum; instructors and hands-on trainers; test development and certification; training locations; manual development; class registration; provision of supplies).
- 4.4. *Location*—A centralized administration at a regional or state level should be established to provide program oversight (e.g., management, record keeping, scheduling). Certification and training may also be done at the local level to better meet the customers' needs.
- 4.5. *Funding*—Start-up funds will be needed immediately for a variety of start-up tasks (e.g., facilitate meetings, travel, printing). Possible start-up and developmental funding sources may include the following:
- State;
 - Industry contributions;
 - State Planning and Research (SP&R) Funds;
 - Federal Highway Administration;
 - Contributed time, facilities or equipment from industry, consultants, and academia; or
 - Other innovative funding mechanisms (e.g., loans paid back from generated income for courses).
- 4.5.1. Multi-state or regional involvement may result in additional funding sources and a decrease in costs to the individual participants.
- 4.5.2. Course fees should be reasonable, but adequate, to enable the program to become self-sufficient. It is necessary to make a long-term commitment and conduct the program as if it were a business, knowing that the program may lose money initially but should become self-sufficient after several years of operation. Areas where operational support may be available include the following:
- Manuals developed for certification and training may be sold publicly provided copyright laws are followed;
 - Continued financial support from the agency and industry;
 - Continued use of contributed items (e.g., facilities, equipment) from the agency and industry.
- 4.6. *Task Groups*—A task group for each certification area (i.e., asphalt mixture, portland cement concrete, soils, and aggregates):