



1. Introduction

The AASHTO Accreditation Program (AAP) accredits laboratories for standard test methods, practices, and specifications provided by different standards development organizations such as AASHTO, ASTM, ISO/IEC, and certain state highway departments. Some quality management system (QMS) standards included in the scope of the AAP define criteria for supervisory and testing personnel certifications.

QMS standards vary in the level of detail they provide, and the terminology used. This leaves laboratories, specifying agencies, and accreditation bodies with some level of uncertainty regarding the conformance criteria for personnel certifications required by ASTM standards C1077, C1093, D3666, D3740, and E329.

AASHTO R 18 does not require personnel certifications, but if a laboratory desires to be accredited for ASTM standards C1077, C1093, D3666, D3740, or E329, it must maintain certifications for its supervisory and testing personnel in conformance with the requirements of those standards and this policy.

Because AASHTO Accreditation is site-specific, the laboratory must request special consideration by the AASHTO re:source Administrative Task Group (ATG) to approve situations in which personnel are working at multiple locations. This is true even for those standards that specifically allow for one person to oversee multiple locations such as ASTM E329.

If the standard requiring the certification does not specify national, regional, state, external, or third party, the certification can be created and administered internally so long as the creator of the examination is not the person taking the examination.

The AAP does not accept expired certifications of any kind. Even if no requirement for recertification is stated in the ASTM standard, expired certifications are not considered to be valid.

2. Terminology

There are terms used in this document that warrant additional explanation so that all readers understand the wording of the policy.

Authority – a government agency or an entity that has been delegated the authority to act on behalf of a governmental agency to carry out a specific activity on behalf of that governmental agency.

Discussion: An association, research, or trade association providing certifications is not considered to be an authority unless a government agency has delegated the authority to them.

CERT- the AASHTO Accreditation Program's (AAP) Certification Exam Review Team. This team is managed by AAP staff and reviews exams for internal certification approval.

Certificant – an individual who holds a current certification that conforms to the requirements of the applicable QMS standard.

Certified – holding a valid credential that recognizes the competency of the certificant through passing a formal examination

External certification program – A program approved through a state DOT or a national or regional authority which was created, administered, and graded through a controlled methodology by a third-party.

Internal certification program – a certification program created, administered, and graded through a controlled methodology by the management of the certificant or with influence from the management of the certificant.

ASTM Quality management system (QMS) standard – any ASTM standard that defines the quality management system and may include accreditation requirements for the construction materials laboratories that are accredited by the AASHTO Accreditation Program (including C1077, C1093, C1222, D3666, D3740, and E329)

Program – A clearly defined set of policies and procedures that have been established to carry out an objective.

Standard – any standard practice, test method, specification, or inspection method that can be included in a certification program

Trainee – a person who is in the process of learning the duties of the position description and is unable to carry out those duties without direct supervision.

3. Accreditation Requirements for ASTM QMS standards

The AAP will only grant accreditation for ASTM standards C1077, C1093, D3666, D3740, and E329 and corresponding material types if the laboratory is accredited for the required standards. The following list shows those requirements as of the revision date on this document:

- a. C1077 (Concrete): C31, C39, C138, C143, C172, C173 or C231, C617 or C1231, C1064; C78 is also required if the laboratory includes the standard in its scope of services
- b. C1077 (Aggregate): C117, C127, C128, C136
- c. C1093: at least one of the following ASTM standards C140, C270, C780, C1019, C1314, or C1552
- d. D3666: at least three standards in the relevant scope of testing (Aggregate, Asphalt Binder, Asphalt Mixture, or Emulsified Asphalt)
- e. D3740: at least five ASTM soil and/or rock standards

- f. E329: all standards required in the underlying ASTM requirement above (ex. C1077's required standards) - if there are none, the following are required:
 - a E329 Sprayed Fire-Resistive Material – E605 or E736

4. Positions Identified in the Standards

The ASTM QMS standards require several key positions to maintain certifications or other credentials. This section identifies the most common positions identified in the standards along with the typical roles served by the person holding each position. It is understood that sometimes one person holds multiple positions, or their position serves multiple roles.

Most laboratories do not identify their technical positions based on the definitions provided in the various ASTM specifications. This leads to industry-wide confusion regarding who exactly needs to be certified to conform to the requirements of the standards. It is not the AAP's intent to make the laboratory redefine the titles of their positions to conform to the terminology in the standards. Instead, the AAP's intention is to verify the personnel who must be certified by their operating capacities are certified in conformance to the standard requirements.

[The AASHTO Accreditation Program \(AAP\) Personnel Requirements Summary Table](#) is stored on the AASHTO re:source website in the document library. A combination of external and internal certifications may be used together to meet the complete requirements of an ASTM QMS standard. For example, if an external certification only includes written and performance examinations for 3 soil standards, the remaining 2 soil standards can be covered using internal approved written examinations and performance evaluations to meet for D3740.

These are some of the individual position titles identified in ASTM QMS standards along with their roles and responsibilities:

- a. **Technical Director** – the person charged with overall responsibility for the technical operations of the laboratory. This person must have duties related to the laboratory operations that indicate responsibility.
- b. **Laboratory Supervisor** – the person who supervises the technicians. This person often performs training and competency evaluations. The responsibilities may be the same as those of the Laboratory Manager or a Supervising Laboratory Technician.
- c. **Field Supervisor** – the person who supervises the field technicians. The responsibilities may be the same as those of the Laboratory Supervisor or Supervising Laboratory Technician when there are not many laboratory and field personnel.
- d. **Supervising Laboratory Technician** – the *technician* who also provides supervision or direction to the other laboratory technicians. A person who does not perform testing cannot be considered for this position. This is often the same person as the Laboratory Supervisor because that person supervises and occasionally performs testing.
- e. **Supervising Field Technician** – the *technician* who also provides supervision or direction to the other field technicians. A person who does not perform testing cannot be considered for this position.

This is often the same person as the Field Supervisor because that person supervises and occasionally performs testing.

- f. **Technician** – the person that performs testing in the laboratory or field (as applicable).
- g. **Inspector** – the person that performs inspecting in the laboratory or field (as applicable).

5. Identifying the Personnel that Hold the Positions

The AAP identifies personnel that hold the positions based on the information found on one or more of the following documents: the laboratory's organizational chart; test records; test reports; technician matrices; assessment worksheets; and on-site observations. The organizational chart is the primary source of information, but other documents and observations may be used to determine the true organizational structure of the laboratory.

ASTM D3666, D3740, and E329 indicate that a person may fill multiple positions with a company if they meet the qualification requirement for the highest-level position. ASTM C1077 does not permit the qualification for the highest-level position to satisfy the requirements for other positions; C1093 explicitly states that it is satisfactory for a person to fill one or more positions in an agency providing that person is qualified for each position. Therefore, if someone fills multiple positions at a laboratory, that person must hold all required credentials for each position when pursuing C1077 or C1093.

For example, a PE who manages the testing services and who also performs aggregate tests in the laboratory **does** qualify as a D3666 (Aggregate) and E329 (Aggregate) testing technician based on this license; however, this person **does not** qualify as a C1077 (Aggregate) testing technician based on this license. This person would also need to possess a current certification per Section 6.1.3 and 6.1.3.2 of C1077-17 for the laboratory to conform to C1077 (Aggregate).

If a laboratory is accredited for standards that require supervisory staff and technicians to maintain certifications, everyone holding the positions requiring certifications must conform to the requirements of the standard. It is not acceptable to only have a supervisor maintain certifications while the technicians are not certified. It is understood that temporary hires and summer help may be added during construction season, but the AAP requires all employees to hold the required certifications for the work that they perform.

a. Organizational Charts

Laboratories must maintain an organizational chart that accurately reflects the names and position titles of those persons currently employed. The assessor will evaluate its accuracy through observations during the assessment. AAP will also review and evaluate the organizational chart during initial accreditations, annual reviews, and anytime a nonconformity is written in the report. It is common for a laboratory to initially submit an organizational chart and certification documentation for review that results in a certification nonconformity. In most cases, the appropriate action for the laboratory to take is to begin working on obtaining the required certifications to resolve any nonconformities.

In some cases, after being notified of a nonconforming situation, laboratories attempt to simply submit a restructured organizational chart and explanation to resolve the nonconformity. AAP does not allow for

restructuring of the staff on the organizational chart to meet the QMS standard certification requirements. See examples below:

- Swapping supervisory roles with non-supervisory personnel because one person holds a required certification while the other does not
- Making any other changes that do not accurately capture the laboratory's personnel hierarchy involved in the various testing services offered by the laboratory.

However, if the laboratory did not originally accurately capture the true organizational structure of the laboratory, the updated organizational chart and the laboratory's explanation for any changes will be evaluated by the AAP. A determination will be made as to whether any such changes appear to be acceptable. Assessment observations are usually required to verify these types of claims.

b. Trainee Status Staff

It is not permissible to reclassify technicians as trainees. The AAP does not accredit a laboratory with only trainees as technicians or supervisors regardless of how the laboratory identifies the personnel. The laboratory must demonstrate conformance to the personnel qualification requirements for all personnel involved.

6. External Certification Programs

a. Evaluating External Certification Programs

When a laboratory submits certifications that have not been vetted by the AAP, the AAP staff researches the content of the certification program to determine whether it conforms to the requirements of the ASTM standards, keying in on certain program components such as:

- Has the program been approved by a state DOT or a national or regional authority?
- What standards are included in each program?
- Are written examinations included?
- Are performance examinations included?
- What types of questions are included and how are they administered?
- Do the programs have expiration dates?
- Can we determine the status of a certification through the program administrator?

Where possible, the AAP reviews external certification programs using the same criteria used for internal certification programs (Section 8). If a program does not conform, AASHTO re:source may provide the program administrator with a detailed explanation for this decision. The external certification program can submit evidence to the AAP for reexamination of their certification program to be approved at any time.

For a list of external certification programs that have been reviewed by the AAP, please review the [External Certification Programs](#) table that is stored in the re:university section the AASHTO re:source website.

b. External Certification Program Written and Performance Examination

A supervisor or technician may pass a written examination but fail the performance examination or not have access to a performance examination. A similar situation can occur when a supervisor or technician

passes the performance examination but either fails or does not have access to a written examination. When this occurs, the AAP does not consider this an external certification because the certification program's minimum requirements were not met, and a certification was not issued, from the external certification program.

Please see [The AASHTO Accreditation Program \(AAP\) Personnel Requirements Summary Table](#) for information on which ASTM QMS standards require external certification programs approved by a state DOT or national or regional authority; or allow for internal certification programs.

c. AASHTO and State Standards in Certification Programs

Some certification programs include AASHTO or state standards instead of ASTM standards. The AAP will review the standards and determine if they are equivalent to ASTM standards.

7. Internal Certification Programs

a. Evaluating Internal Certification Programs

A laboratory may choose to create its own written and performance examinations for conformance where internal certifications are permitted. The CERT will evaluate the internal certification program based on conformance to the requirements of the standards and the rigor of the written examinations. This evaluation is accomplished through a committee review approach. In-house examinations submitted for conformance must include standards for which the laboratory is accredited.

If a laboratory is using an internal certification program and the laboratory has been found to be out of conformance with the requirements of the AAP through the assessment reports or proficiency sample testing, the AAP reserves the right to disallow the use of internal examinations for that laboratory at any time; official notice will be sent to the laboratory main contacts.

b. Initial Exam Requirements for CERT Review Submittal

i. Examination Revision Dates

The examinations must include revision dates for both the examination and the applicable standards. The revision date for the written examination is the month, day, and year the examination was created or last revised. The revision date for the standard is the published date for the standard included in the examination, including any letters used to identify multiple updates that have occurred within the same year (ex. ASTM C31-19a). Notations used to signify updates to a standard that are only editorial in nature do not need to be included in the revision date for the test standard. For example, ASTM D1557-12^{e1} can be identified as simply D1557-12 on the laboratory's written examination.

ii. Answer Key Requirements

A completed answer key must be submitted with each exam. Each answer must also include the section number and the name of the section from the standard it references.

iii. Independent Evaluators

The examinations must include the name(s) of the author(s) to ensure that the examinee is not the author of the written examination. Anyone is permitted to administer the examinations; however, the author of the written examination cannot be the examinee.

c. Fees

Laboratories that submit internal written exams to meet the certification requirements from ASTM standards will be charged a review fee of \$100 per exam. One exam is considered to be the list of questions and answer key covering the required sections of **one** ASTM standard or applicable Annex accreditation listing.

d. Exam Requirements

i. Required Sections

The questions must effectively evaluate the examinee’s knowledge of the important aspects of the standards. Please use Table 1 below, to identify required sections to be covered by each QMS standard.

Table 1. Required Sections to be Included in Each Written Examination

	C1077	C1093	D3740	E329
Significance and Use	✓	✓	✓	
Samling	✓	✓	✓	
Specimen Preparation	✓	✓	✓	
Procedure	✓		✓	✓
Calculations	✓	✓		
Reporting of Results	✓	✓	✓	
Additional Requirements from underlying standards				✓

Certain standards include required content in sections of the test method that are not named with the exact section designations used by ASTM C1077, C1093, or D3740. For example, there may be content that is relevant to a standard’s procedure that is found in a section that is not titled “Procedure.” In such cases, the required coverage of the written examinations is not limited to the content that is strictly titled as such in the standard, but that the required coverage extends to all the sections that include relevant content, regardless of how they are named within the individual test methods.

Some standards do not include relevant content for a specified section at all. For example, there may not be content that explains or pertains to the significance and use of a standard. In such cases, there is no requirement for this section to be included in an in-house exam.

ii. Number of Questions

The scope of each question asked, and the number of questions being asked, are evaluated and compared with the amount of relevant material that needs to be covered. The laboratory is then notified of the need to add a certain number of questions to adequately cover a particular section of a standard. One question is not enough to test a technician's knowledge of a Significance and Use section that spans twelve subsections and notes; neither are two questions enough to adequately test the knowledge of a Procedure that spans two full pages of a standard. However, some questions may be more comprehensive than others. Due to this unpredictable variation within the questions themselves, there is no objective minimum required number of questions assigned beforehand to the review of each written examination.

iii. Types of Questions

Examinations can include multiple choice, fill-in-the-blank, true or false, matching, short answer, and calculation questions. The AAP evaluates the questions and answers on their ability to assess the competency or knowledge of the examinee. If a question is judged to be too vague, overly simplistic, or incorrectly worded, it will not be counted toward meeting the requirements specified in applicable QMS standards.

iv. Calculations

When applicable, questions that cover the calculations of a test standard are required. In evaluating examinations for conformance to this requirement, the CERT is looking for questions where mock data is supplied, and the technician is required to calculate the answer from this data. Where not specifically required, it is strongly recommended that such questions likewise be employed. This provides technicians with the opportunity to demonstrate their understanding of how the data they record feeds into the intermediate and final results of a test.

v. Best Practice

In addition to covering all required sections, as applicable, there are other sections found in certain standards that should be covered by written examinations. Some ASTM standards mention such aspects as (1) apparatus, (2) the principles underlying the standard, (3) the basis of some of the required calculations, and (4) common sources of error. Although it is not required for written examinations to cover this additional content, it is considered best practice to do so. Another example includes the Scope section found in many standards, which can include critical information. Examinations should also address calibration, standardization, check, or maintenance requirements where relevant to the testing technician.

viii. Re-evaluations of Approved Examinations

Once approved, the CERT will not need to re-evaluate the examinations unless there is a major change made to (1) the ASTM QMS standards, (2) the test standard, (3) a relevant AAP policy, or (4) it is found that the original review was in doubt.

If the AAP determines a re-evaluation is needed, the laboratory will be required to submit the current examinations for review by a specified deadline. If the examinations are not updated and

approved by the deadline, the AAP will no longer accept the internal exams as an approved internal certification program.

A major change to an ASTM QMS standard is defined as a change in the required intervals for recertification or the required content in the written examinations. As an example, in 2012, ASTM D3740 redefined the contents of the examinations. In 2013, ASTM C1077 added the 5-year interval for recertification.

If a major change is made to one of the ASTM QMS standards, or to a relevant AAP policy, the AAP will grant laboratories time to conform to the new requirements of the standard or policy update.

A major change to a relevant standard would include changes to required sections of the standard. Examples include, but are not limited to, changes that (1) either directly or indirectly impact test results, (2) render portions of the standard's content obsolete, (3) impact the way that the technician performs the test, from sampling to the reporting of results, etc. The examinations themselves need to be updated within one year of the publication date of the updated standard, and technicians *may* also need to be recertified by means of these examinations within this one-year period, with variations to this recertification policy explained below.

e. The CERT Committee Review Process

A lab may submit internal written exams for review to their state quality analyst or the quality analyst assigned to their assessment report. The AAP's Certification Examination Review Team (CERT) conducts a preliminary review, which includes an objective determination of which parts of the examination each question covers, a determination regarding conformance to stated requirements, and a subjective determination regarding the rigor of the examination.

The preliminary review is discussed in a committee meeting. The results of the discussion and marked up version of the examinations will be prepared by the chair of the CERT committee. The chair will attach the summary of the evaluation as a PDF to the written examination.

If the examinations do not conform to the requirements of the applicable QMS standard(s) or this document, the specific reasons for a lack of conformance are communicated to the laboratory.

When a lab completes the required updates needed for their exams, they need to submit the PDF versions back to the quality analyst for final review. The laboratory will then be notified if the exams are approved and can be administered to staff or if additional updates need to be made.

When making updates to exams that have been through the initial review process, CERT requires that already reviewed questions are not deleted, unless requested by the CERT committee. It is preferable to put all additional questions at the end of the exam. If they are added throughout the exam, the lab must highlight them, so the updated questions are clear for the reviewer.

8. Intervals for Recertification

- ASTM C1077: has a defined maximum interval for recertification of 5 years, which include both written and performance examinations.
- ASTM C1093: has a defined maximum interval for recertification of 5 years, which include both written and performance examinations.
- ASTM D3666: does not have a maximum interval for recertification.
- ASTM D3740: has not defined a maximum interval for the written examination recertification.
- ASTM E329: does not have a maximum interval for recertification. Intervals for preceding ASTM QMS standards must be followed where applicable.

If an interval is specified for recertification, those recertifications must include a formal evaluation by the certification body. For a certification body that only includes a written examination and confirmation by the supervisor of the applicant that the applicant is competent to perform the testing included in the certification (ex. NICET), a written examination must be conducted at the specified interval. The laboratory personnel may retest through that program even if the program does not specifically require retesting at the specified interval. The dates of retesting must be confirmed by the AAP before the certification can be accepted.

For internal certifications, the laboratory may define their own internal intervals for recertification as long as the interval does not exceed the maximum interval in the ASTM QMS standard(s).

9. Training and Competency Evaluation

Some ASTM QMS standards define a training and competency evaluation interval. This is sometimes confused with certification requirements, but the training and competency evaluation requirements are separate from the certification requirements.

- ASTM C1077: Competency evaluations must take place at least every 24 months for supervisors and technicians.
- ASTM C1093: Interval can be defined by laboratory.
- ASTM D3666: Interval can be defined by laboratory.
- ASTM D3740: Competency evaluations must take place at least every 24 months for technicians and at least every 36 months for supervisors.
- ASTM E329: Competency evaluations must take place at least every 36 months for supervisors and technicians.

Summary of Changes:

Rev 11/1/2018: Expanded trainee information (terminology and explanation in Rev 7/1/2019: New fees added for review of internal exams.

Rev 11/18/2019: New fee section added to policy (Section 2).

Rev 10/16/2020: Added certification requirements from C1093-19; added personnel experience requirements; clarified accreditation requirements for underlying standards and the required standards

for certification; deleted the terminology of test method and added terminology for standard; updated the term test method to standard throughout the document.

Rev 9/14/2021: Added statement to section 6A indicating that labs must record the section number and name of the section from the standard on the answer key

Rev 3/10/2022: Added section 6 (Third-Party Written and Performance Examination) to clarify when portions of an external certification would be accepted as an internal certification. Added statement to section 7i indicating that all written examinations must include the name of the author.

Rev 2/17/2023: Added definitions to clarify AAP's interpretation of terminology that exists in ASTM standards. Removed older notations for past revisions.

Rev 7/24/2024: Entire reorganization of document for better flow. Added definitions and updated all sections within document to include current and relevant information.

Rev 9/13/2024: Updated section 6a to include a reference to the external certification program table that is available on the AASHTO re:source website.

