



Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation¹

This standard is issued under the fixed designation C1077; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This practice identifies and defines the duties, responsibilities, and minimum technical requirements of testing agency personnel and the minimum technical requirements for equipment utilized in testing concrete and concrete aggregates for use in construction.

1.2 This practice provides criteria for the evaluation of the capability of a testing agency to perform designated ASTM test methods on concrete and concrete aggregates. It can be used by an evaluation authority in the inspection or accreditation of a testing agency or by other parties to determine if the agency is qualified to conduct the specified tests.

NOTE 1—Specification E329 provides criteria for the evaluation of agencies that perform the inspection of concrete during placement.

1.3 This practice provides criteria for Inspection Bodies and Accreditation Bodies that provide services for evaluation of testing agencies in accordance with this practice.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- C31/C31M Practice for Making and Curing Concrete Test Specimens in the Field
- C39/C39M Test Method for Compressive Strength of Cylindrical Concrete Specimens

¹ This practice is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.98 on Evaluation of Laboratories.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

- C78/C78M Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
- C117 Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing
- C125 Terminology Relating to Concrete and Concrete Aggregates
- C127 Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
- C128 Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate
- C136/C136M Test Method for Sieve Analysis of Fine and Coarse Aggregates
- C138/C138M Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- C143/C143M Test Method for Slump of Hydraulic-Cement Concrete
- C172/C172M Practice for Sampling Freshly Mixed Concrete
- C173/C173M Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
- C231/C231M Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
- C617/C617M Practice for Capping Cylindrical Concrete Specimens
- C802 Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction Materials
- C1064/C1064M Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
- C1231/C1231M Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Cylindrical Concrete Specimens
- D75/D75M Practice for Sampling Aggregates
- D2419 Test Method for Sand Equivalent Value of Soils and Fine Aggregate
- E4 Practices for Force Verification of Testing Machines
- E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves
- E329 Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

*A Summary of Changes section appears at the end of this standard

E1301 Guide for Proficiency Testing by Interlaboratory Comparisons (Withdrawn 2012)³

2.2 *ACI Standards:*

ACI 214-77 Recommended Practice for Evaluation of Strength Test Results of Concrete⁴

2.3 *ISO Standards:*

ISO 17011 Conformity Assessment—General Requirements For Accreditation Bodies Accrediting Conformity Assessment Bodies⁵

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this practice, refer to Terminology C125.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *evaluation authority, n*—an independent entity, apart from the testing agency being evaluated, that has the capability to provide an unbiased evaluation of the technical activities of concrete and concrete aggregates testing agencies in accordance with Annex A1 or Annex A2.

3.2.1.1 *Discussion*—Two acceptable methods of evaluation are inspection and accreditation, and these evaluations are offered by many evaluation authorities. An inspection is an evaluation of equipment and procedures based on the Test Methods and Procedures section, along with a review of the quality system. An inspection report is the final step in the process for an inspection agency. The testing agency being evaluated performs corrective actions for any deficiencies noted, and these corrections are to be placed with the other inspection documentation as part of the permanent record of the inspection. An accreditation agency uses the results of the inspection report or the results of their own onsite assessment as one phase of the accreditation process. As a separate phase, the accreditation agency also reviews the testing agency's corrective actions for the deficiencies noted and issues a certificate of accreditation once all of the deficiencies have been corrected. There is no universally accepted evaluation authority in the construction materials testing field; therefore, testing agencies should give careful consideration when selecting an evaluation authority to gain the most benefit from the evaluation. In most cases, a testing agency will select an evaluation authority as a result of requirements in a project specification, or contract, or in response to local codes, or other industry requirements. In those circumstances, the requirements will stipulate the acceptable evaluation authorities. If there are no specific requirements and the evaluation is in anticipation of future work or to compete with other local testing agencies, then the agency should contact the organization(s) most likely to use their services for a list of acceptable evaluation authorities. A list of evaluation authorities is provided in the Qualification of Personnel and Laboratory Evalu-

ation section of the Manual of Aggregate and Concrete Testing.⁶ The list is merely a collection of organizations willing to provide this service and is not an endorsement of any particular organization. Other organizations may also be available to provide this service.

3.2.2 *external technical services, n*—those services required by a testing agency that are provided by another organization.

3.2.3 *quality systems, n*—those internal procedures and practices that an agency utilizes to ensure continued compliance with applicable testing standards for concrete and concrete aggregates.

3.2.4 *testing agency, n*—organization that measures, examines, performs tests, or otherwise determines the characteristics or performance of materials or products. This includes organizations that offer commercial testing services, an in-house quality control function, an academic institution, or any other organization providing the required testing services, whether performed in the laboratory or in the field.

4. Significance and Use

4.1 The testing and inspection of concrete and concrete aggregates are important elements in obtaining quality construction. A testing agency providing these services shall be selected with care.

4.2 A testing agency shall be deemed qualified to perform and report the results of its tests if the agency meets the requirements of this practice. The testing agency services shall be provided under the technical direction of a registered professional engineer.

4.3 This practice establishes essential characteristics pertaining to the organization, personnel, facilities, and quality systems of the testing agency. This practice may be supplemented by more specific criteria and requirements for particular projects.

5. Organization

5.1 The following information shall be readily available for review:

5.1.1 Description of the organization, including:

5.1.1.1 Complete legal name and address of the main office and each testing agency location,

5.1.1.2 Names and positions of the principal officers and the responsible, registered professional engineer in charge, and

5.1.1.3 Description of the testing agency management structure.

5.1.2 Listing of the relevant technical services offered, and

5.1.3 All external technical services normally utilized.

5.2 The testing agency shall designate an individual with access to management who has the responsibility of seeing that procedures required in this document are being carried out.

6. Personnel Qualifications

6.1 Information shall be made available to substantiate personnel qualifications as follows:

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333-9094, <http://www.aci-int.org>.

⁵ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, <http://www.iso.ch>.

⁶ Manual of Aggregate and Concrete Testing, *Annual Book of ASTM Standards*, Vol 04.02.

6.1.1 All relevant testing services shall be provided under the full-time technical direction of a licensed professional engineer with at least 5 years experience in construction materials testing.

6.1.2 Laboratory and field supervisors shall meet the following requirements:

6.1.2.1 Possess at least 3 years relevant experience.

6.1.2.2 Shall be certified in the relevant tests required of the personnel they are supervising, as outlined in 6.1.3.

6.1.3 Personnel performing laboratory and field testing shall possess current certification(s) that includes a written and performance examination for each relevant standard identified in 6.1.3.1, 6.1.3.2, and 6.1.3.3 and shall conform to the requirements identified in 6.1.4.

6.1.3.1 Concrete laboratory testing certification(s) shall include the following standards: Test Method C39/C39M and Practice C617/C617M or C1231/C1231M. Test Method C78/C78M is also considered a relevant test if it is included on the agency's list of technical services.

6.1.3.2 Aggregate laboratory testing certification(s) shall include the following standards: Test Methods C117, C127, C128, and C136/C136M.

6.1.3.3 Concrete field testing certification(s) shall include the following standards: Practices C31/C31M and C172/C172M, and Test Methods C138/C138M, C143/C143M, C173/C173M, C231/C231M, and C1064/C1064M.

6.1.4 The certification program shall meet the following criteria:

6.1.4.1 The written examination shall be of sufficient length and detail to cover the test method or practice, including, as applicable: the significance of the test or practice, sampling, specimen preparation, procedure, calculations, and reporting of results,

6.1.4.2 The performance examination shall include a demonstration of the test method or practice, to document the individual's ability to correctly perform the procedure in accordance with the standard, and

6.1.4.3 The written and performance examinations shall include all relevant test methods that are listed in the section above for the type of individual being certified.

NOTE 2—A list of certification programs is provided in the Qualification of Personnel and Laboratory Evaluation section of the Manual of Aggregate and Concrete Testing.⁶ The list is merely a collection of certification programs and is not an endorsement of any particular program. Other programs may also be available.

6.1.4.4 The certification body shall establish the period of certification but not to exceed five years.

6.1.4.5 The period for which the certification is valid shall be clearly and prominently stated on any documents that attest to the certification(s) held by the individual.

7. Test Methods and Procedures

7.1 The testing agency shall be capable of performing the required ASTM test methods, guides, or practices in 7.2 and may request additional evaluation for the optional methods in 7.3 to the extent that those services are provided by the agency.

7.2 Required Test Methods and Practices:

7.2.1 For Agencies Testing Concrete:

7.2.1.1 *Sampling*, Practice C172/C172M,

7.2.1.2 *Slump*, Test Method C143/C143M,

7.2.1.3 *Unit Weight, Yield, and Air Content*, Test Method C138/C138M,

7.2.1.4 *Air Content*, Test Method C173/C173M (volumetric method), or Test Method C231/C231M (pressure method), or both.

7.2.1.5 *Temperature*, Test Method C1064/C1064M,

7.2.1.6 *Making and Curing Test Specimens*, Practice C31/C31M,

7.2.1.7 *Compressive Strength*, Test Method C39/C39M,

7.2.1.8 *Capping Cylinders*, Practice C617/C617M or Practice C1231/C1231M.

7.2.2 *For Agencies Testing Concrete Aggregates:*

7.2.2.1 *Sieve Analysis*, Test Method C136/C136M,

7.2.2.2 *Material Finer Than 75-µm (No. 200) Sieve*, Test Method C117, and

7.2.2.3 *Specific Gravity and Absorption*, Test Method C127 (Coarse Aggregate) and Test Method C128 (Fine Aggregate).

7.3 Optional Test Methods or Practices:

7.3.1 Some testing agencies conduct other tests on concrete and concrete aggregates in addition to those listed in The *Required Test Methods and Practices* Section. These optional test methods and practices could include any of the test methods or practices developed by Committee C09 and contained in volume 04.02, as well as other related standards such as Practice D75/D75M and Test Method D2419. The agency shall have evidence of proper facilities, equipment, and trained personnel to comply with the applicable test method or practice, if it is included in the scope of services as defined by the agency. The agency and the evaluation authority will mutually agree upon which optional test methods or practices will be included in the agency's evaluation. The evaluation authority shall then select which of the optional test methods or practices offered by the agency need to be demonstrated by the personnel.

7.4 The testing agency shall use the latest version of each referenced method within one year of its publication unless an earlier version of the standard is required by the client.

7.5 Testing agency personnel shall have convenient access to applicable standards.

8. Facilities, Equipment, and Supplemental Procedures

8.1 *General*—The testing agency shall have facilities and equipment conforming to the requirements of the applicable test method. This section contains equipment requirements and procedures that clarify certain provisions of the test methods.

8.2 *Procedures Related to Required Test Methods*—In addition to standard test method requirements, the conditions listed in 8.3 and 8.4 shall be met.

8.3 For Agencies Testing Concrete:

8.3.1 *Compressive Strength Testing Machines*, shall conform to the applicable requirements of Test Method C39/C39M.

8.4 For Agencies Testing Concrete Aggregates:

8.4.1 *Sieve Accuracy*—Verification of sieve accuracy shall be performed at least annually on each sieve used in the test for sieve analysis (Test Methods **C117** and **C136/C136M**). Any one of the following three methods of verification is acceptable. Each method of sieve verification shall include an inspection of the sieve cloth for punctures or obvious defects.

8.4.1.1 Verification of each sieve used according to the procedures prescribed in the Annex of Specification **E11**.

8.4.1.2 A comparison of the results of a split sample sieved on different sieve sets. Results shall be verified for single operator precision to be within the acceptable range of two results stated in the test method.

8.4.1.3 Participation in the sieve analysis test in an aggregate proficiency sample program, as described in the Quality Systems section. Results shall be verified for multilaboratory precision to be within the acceptable range of two results stated in the test method.

8.4.2 *Mechanical Sieve Shaker*—When mechanical sieving devices are used, the period of mechanical agitation shall be checked at least annually for adequacy of sieving as described in Test Method **C136/C136M**. Mechanical agitation periods shall be established for each different type of aggregate tested.

NOTE 3—Different types of aggregate refer to shape and composition, not supplier. For example, agitation periods for elongated materials may need to be extended, while softer materials that break down easily may require a shorter period to minimize alteration of the particle size distribution.

8.4.3 *Relative Density (Specific Gravity) and Absorption Tests*—When performing the procedures of Test Methods **C127** and **C128**, duplicate tests shall be made at least once every 6 months. Results shall be verified for single operator precision within the tolerance stated in the respective test method. Participation in a proficiency sample program with relative density (specific gravity) and absorption testing is an acceptable alternative.

8.4.4 Balances or scales for all concrete and aggregate tests shall be calibrated annually.

8.5 *Procedures Related to Optional Test Methods:*

8.5.1 If the applicable test method requires equipment calibration and does not specify a frequency, then the testing agency shall establish a frequency in its quality assurance program and conform thereto.

8.5.2 In the event that the testing agency borrows or rents equipment to perform an optional test method, the agency shall be able to document that it obtained the appropriate equipment and that the equipment was calibrated, standardized, or verified.

8.6 All equipment listed in this section shall be calibrated or verified before being placed in service. Equipment not in operating condition or out of tolerance shall be marked as such and taken out of service until corrected.

9. Testing Agency Records and Reports

9.1 The testing agency shall maintain a system of records that permits verification of any issued report.

9.2 The records of the testing agency shall contain the following information:

9.2.1 Standard operating procedures for the following:

9.2.1.1 Identification of the test sample,

9.2.1.2 Transfer of the sample from the field to the testing facility, and

9.2.1.3 Recording of test results.

9.2.2 Calibrations or verifications of equipment required by the test method for all of the tests offered in the scope of the testing agency's services. The records shall include:

9.2.2.1 The identification of the specific piece of equipment,

9.2.2.2 The identification of the equipment used to perform the calibration or verification,

9.2.2.3 The name of the individual who performed the calibration or verification,

9.2.2.4 The date the calibration or verification was performed,

9.2.2.5 The quantity measured by the equipment (such as length, force, or mass), and

9.2.2.6 The associated accuracy of the measurement or a comparison of the measured quantity with the associated allowable tolerances, as necessary to verify that the equipment complies with the requirements in the relevant standards. Where additional calibration or verification requirements have been listed in the *Facilities, Equipment, and Supplemental Procedures* Section, this information shall also be included in the records.

9.2.3 Records on testing agency personnel that document work experience, education, on-the-job training, and methods used to ensure continued competence in performing the required test methods,

9.2.4 Audits and inspections by outside agencies and all reports or certifications, with applicable dates, of any evaluation or accreditations issued by any evaluating authorities,

9.2.5 The testing agency shall retain results of participation in proficiency sample programs, including data sheets, summary reports and, if low proficiency sample ratings are received, a record of the agency's investigation into the reason for the low ratings and corrective action taken.

9.2.6 Current standard test methods and other pertinent reference material in a library,

9.2.7 Identification of the person performing the field and laboratory tests, and

9.2.8 Documents that establish the traceability to an acceptable reference standard or a national standard for load cells, proving rings, thermometers, test weights, and test equipment used for verification or calibration of testing equipment.

9.3 Agency test reports shall accurately and clearly present the specified test results and all pertinent data.

9.4 Test reports shall include the following information:

9.4.1 Name and address of the testing agency,

9.4.2 Identification of the report and the date issued,

9.4.3 Name of the client,

9.4.4 Project identification,

9.4.5 Sample identification,

9.4.6 Identification of the standard test method used, a notation of all known deviations from the test method, and all requirements of the test method that were not performed by the testing agency (**Note 5**),

9.4.7 Test results and other pertinent data required by the standard,

9.4.8 Name of the registered professional engineer or his designee, and

9.4.9 Identification of results obtained from tests performed by other testing agencies.

9.5 Corrections or additions to reports shall clearly reference the report being amended.

9.6 All records required by this standard shall be stored safely for at least 3 years, unless otherwise required by law or governing specifications. Those records that are confidential in nature, including test reports and other records generated as required by contract with the client, shall be stored safely in confidence to the client, unless otherwise required by law, governing specification, or client requirements.

NOTE 4—There are circumstances when a longer retention period may be advantageous to the testing agency. Records concerning the calibration, verification, and standardization of equipment are an example. Records of this type are often held throughout the useful life of the equipment.

NOTE 5—Deviation from standard test methods may adversely affect results.

10. Quality Systems

10.1 The testing agency shall maintain a quality manual of written procedures for ensuring the quality of the services offered (Note 8). In addition to the following information, each page in the manual shall contain a preparation or revision date to ensure the latest procedure is being followed.

10.1.1 Internal quality assurance program, including:

10.1.1.1 Personnel training and evaluation including a description of the training program, the method of evaluation, the frequency of the review, the criteria used, and the title or name of the individual responsible for administering the evaluations,

10.1.1.2 Equipment calibration and maintenance,

10.1.1.3 A current library including all relevant test methods, and

10.1.1.4 Inventory of all test equipment requiring both an initial and a subsequent periodic calibration or verification that is used by the agency to perform the test methods covered by this standard and within the agency's scope of services. The inventory shall include the equipment description, identification number, and next date of calibration or verification.

NOTE 6—The inventory should include equipment such as scales, compression machines, and slump cones. Equipment such as tamping rods and expendable supplies such as single-use cylinder molds need not be included on the inventory.

10.1.1.5 Participation in proficiency sample programs (PSP). The agency shall participate in concrete or aggregate proficiency sample programs or both if the agency performs testing in both areas. The PSP used shall meet the following criteria: (1) include a minimum of 10 participants, (2) issue a report that includes the agency's results, the average of all results, the standard deviation of the results, and rating(s) based on the number of standard deviations that the agency's results vary from the grand average for the test method(s) covered, (3a) include at least one of the following methods if the agency tests concrete: C39/C39M, C138/C138M, C143/C143M, C173/C173M, or C231/C231M; and, (3b) include at least one of the following methods if the agency tests concrete aggregate:

gates: C136/C136M, C127, or C128, (4) be independent of the participating agencies, (5) distribute samples at least once annually, and (6) maintain a record of all sample test results from participants for at least 3 years.

NOTE 7—For additional guidance in selecting a proficiency sample program the testing agency may wish to consult Guide E1301.

10.1.2 The testing agency shall establish procedures for responding to low proficiency sample program ratings. Ratings are considered to be low if the agency's result is beyond two standard deviations from the grand average on the final report.

10.1.3 The testing agency shall establish procedures for handling technical complaints from clients that includes the title or name of the individual responsible for handling the complaint, the review system in the agency and the type of reply to be issued.

10.1.4 The laboratory shall have a procedure in its quality system that shall be implemented when it is determined that equipment is out of calibration or testing procedures are found to be deficient. The laboratory shall halt any work affected by any deficiency until corrective actions have been completed and documented. The laboratory shall review all affected work performed between the time when the equipment or testing procedure was last verified and when the deficiency was discovered. The laboratory shall evaluate the significance of any deficiency on reported results and, if necessary, notify clients of the possibility of nonconforming test results.

10.1.5 The testing agency shall establish procedures for ensuring the quality of external technical services, such as: calibration services used by the agency, equipment and materials procured by the agency from vendors, and subcontractors (that is, an agency contracted to perform a standard test method or part of a test method). The agency should be able to demonstrate that the subcontractor is competent and is in compliance with the requirements of the test methods. The agency should maintain records of the subcontractor and vendor evaluations. The selection and evaluation criteria for the subcontractor should include a review of external audits, inspections, certifications, and accreditations held by the agency.

NOTE 8—Other recommended quality programs for a testing agency include: (1) Conducting within-laboratory statistical computations on concrete tests. Randomly selecting 10 tests per month and determining the within-test standard deviation (see ACI 214-77 and Practice C802 for statistical methods); (2) Participation in an interlaboratory proficiency program on concrete tests. A quarterly exchange of samples between agencies in accordance with Practice C802 will provide excellent quality assurance data.

11. Testing Agency Evaluation

11.1 The testing agency shall have its facilities, equipment, personnel, and procedures evaluated at intervals of approximately 2 years by an evaluation authority to confirm its ability to perform the required tests.

11.2 Two methods of evaluation, either inspection or accreditation, are acceptable.

11.2.1 Responsibilities and duties of evaluation authorities conducting assessments (identified as Inspection Bodies) shall be in accordance with Annex A1.

11.2.2 Responsibilities and duties of evaluation authorities conducting assessments as part of an accreditation process (identified as Accreditation Bodies) shall be in accordance with **Annex A2**.

11.3 The personnel and equipment used by the agency during the evaluation shall be representative of the personnel and equipment available during the period between evaluations. Temporary acquisition of personnel or equipment to enhance the results of the evaluation shall not be permitted.

11.4 The testing agency shall provide an initial written corrective action response within 30 days of receipt of deficiencies noted in the final report. The agency then will complete all corrections within 60 days of receipt of the final report.

11.4.1 If an inspection service is used, the agency shall supplement the final report with a statement of corrective actions taken, which is signed by the agency's professional engineer.

11.4.2 If an accreditation service is used, the agency shall report deficiency corrections to the Accreditation Body who will issue a certificate of accreditation when its requirements are satisfied.

12. Keywords

12.1 aggregates; concrete; criteria; evaluation; quality assurance (QA); testing ; testing agency

ANNEXES

(Mandatory Information)

A1. EVALUATION AUTHORITIES CONDUCTING ASSESSMENTS—INSPECTION BODIES

A1.1 Organization and Management

A1.1.1 The Inspection Body shall clearly disclose on the inspection report any potential conflicts of interest it or its inspection personnel may have with the testing agency being inspected. This shall include any potential conflicts that could be reasonably construed or perceived to impair the impartiality of their evaluation.

A1.1.2 The Inspection Body shall be under the direction of a manager who is knowledgeable of the applicable standards and inspection processes used.

A1.1.3 The Inspection Body shall implement a quality system appropriate to the type of inspections performed. The Inspection Body shall maintain a quality system manual documenting the procedures and techniques used to accomplish the objectives of its inspection.

A1.1.3.1 The Inspection Body shall maintain documentation of instructions and procedures for conducting inspections and inspection planning. These current written procedures shall be available to inspection personnel. Deviations from written procedures shall be documented during the conduct of an inspection.

A1.1.4 The Inspection Body shall maintain a training program for its personnel that includes the following:

A1.1.4.1 A review of each test method or practice as listed in the "Required Test Methods and Practices" section;

A1.1.4.2 Demonstrations by the trainer of the procedures used in each of these test methods or practices;

A1.1.4.3 Demonstrations by the trainer of the proper use of measurement tools (inspection equipment) needed to evaluate testing agency equipment;

A1.1.4.4 An evaluation by the trainer of the trainee's ability to properly execute the procedures of each test method or practice and to correctly use the measurement tools;

A1.1.4.5 At least one month of supervision by the trainer of onsite testing agency inspection work by the trainee; and

A1.1.4.6 A final evaluation by the trainer of the trainee's competence to conduct an inspection based on performance during the training period.

A1.1.5 The Inspection Body shall maintain an evaluation program for its inspectors that includes the following:

A1.1.5.1 An annual review of inspection techniques; and

A1.1.5.2 An annual review of performance based on customer feedback, including the inspector's knowledge and communication during inspections.

A1.2 Facilities and Equipment

A1.2.1 The Inspection Body shall have the facilities and equipment necessary to provide effective inspection services to its customers.

A1.2.1.1 All equipment used for training and inspections shall be identified and documented.

A1.2.1.2 All measuring equipment shall be maintained in accordance with documented procedures and verified for accuracy before being put into service and at time intervals defined in the quality system manual. When results from the measurement equipment are questionable, such equipment shall not be used until its accuracy has been verified.

A1.2.1.3 Verification or standardization of measuring equipment shall be traceable to applicable national standards. The frequency of verifications or standardizations shall be in accordance with the governing standard or the Inspection

Body's quality system manual. Records of such verifications or standardizations shall be maintained.

A1.2.1.4 Reference measurement standards shall be used only for verification or standardization of measuring equipment. The reference measurement standards shall be standardized by a competent body traceable to nationally recognized standards.

A1.3 Inspection Methods and Procedures

A1.3.1 The Inspection Body shall offer inspection services for testing agencies at the frequency required in the standard or as otherwise requested by the testing agency.

A1.3.2 The inspection services shall include either the required concrete or concrete aggregate test methods and practices, or both, listed in 7.2.

A1.3.3 The Inspection Body shall provide inspection services for any optional method requested by the testing agency within the scope of its services, provided the agency's equipment and procedures can be assessed in a laboratory setting.

NOTE A1.1—There are some test methods and practices that involve observation and assessment techniques of uniquely qualified personnel that may not be possible to be evaluated by inspection personnel.

A1.3.4 The Inspection Body shall evaluate equipment and procedures for each test method or practice presented by the testing agency.

A1.3.4.1 The Inspection Body shall use its equipment to evaluate the testing agency's test equipment and verify the capability of the agency's equipment to measure to the tolerances specified in the relevant standards. Alternatively, review of accuracy verification or standardization records is permitted.

A1.3.4.2 The inspector shall observe demonstration of techniques and procedures by testing agency personnel for each test method or practice presented. At the discretion of the inspector, it is permitted for some procedural aspects of test methods or practices to be described by agency personnel in lieu of demonstration.

A1.3.5 The Inspection Body shall review the qualifications and proficiencies of testing personnel of the agency being inspected. It is permitted to use a representative sampling to evaluate proficiency of testing personnel.

A1.3.6 The Inspection Body shall interview selected testing personnel to evaluate their awareness of test methods and practices and their proficiency in performing them.

A1.3.7 The Inspection Body shall review at least the three previous years of records of testing agency participation in proficiency sample programs as required by this practice.

A1.3.8 The Inspection Body shall review typical data recording procedures and reports generated by the testing agency.

A1.4 Inspection Reports

A1.4.1 The Inspection Body shall issue a final inspection report of findings that lists the test methods and practices covered. The inspection report shall note any deficiencies of testing agency equipment, procedures relative to the pertinent standards, qualification of testing personnel, and other requirements of this standard.

A1.4.1.1 Corrections or additions to an inspection report or the testing agency's documentation of correction of deficiencies shall be retained with the original inspection report.

A1.4.1.2 The complete inspection report, including documentation of actions to correct deficiencies, shall be provided to an Accreditation Body, when the report of the Inspection Body is used as part of the process for accreditation of a testing agency.

A1.5 Statement of Conformance

A1.5.1 Upon request, the Inspection Body shall provide a statement indicating that inspection services were conducted in accordance with this Annex.

A2. EVALUATION AUTHORITIES CONDUCTING ASSESSMENTS—ACCREDITATION BODIES

A2.1 Organization and Management

A2.1.1 The Accreditation Body shall clearly disclose any potential conflicts of interest it or its assessors may have with the testing agency being accredited. This shall include any potential conflicts that could be reasonably construed or perceived to impair the impartiality of their assessment.

A2.1.2 The Accreditation Body shall be under the direction of one or more managers who are knowledgeable on the applicable standards and accreditation processes used.

A2.1.3 The Accreditation Body shall maintain a management system documenting the processes it uses to accomplish the objectives of its assessment for accreditation of testing agencies.

A2.1.3.1 The management system shall document the duties, responsibilities, and authorities of management and assessors. The qualifications of assessors relative to education, training, work and assessment experience, and scope of expertise shall be defined. The system should define what constitutes conflict of interest for assessors.

A2.1.3.2 The management system shall document information about the assessment and accreditation processes for review by users of its accreditation service. The information shall include procedures used for surveillance of accredited facilities, if any, and the process to be used by testing agencies for complaints or appeals.

A2.1.3.3 The management system shall document the procedures used for extending, suspending, withdrawing, or reducing accreditation of testing agencies. The written procedures shall be available to assessors. Deviations from written procedures during the conduct of an assessment shall be documented.

A2.1.3.4 The management system shall document the policies for retention of records for assessor personnel and for assessments.

A2.1.3.5 The management system shall define the process used to inform the public about the status and scope of accredited testing agency facilities.

A2.1.4 The Accreditation Body shall include the results of an on-site inspection of testing agency facilities and testing personnel as part of the assessment for the accreditation of a testing agency facility.

A2.1.5 If the Accreditation Body provides services for on-site inspections of testing agencies, a training program for its inspection personnel shall be maintained in accordance with **A1.1.4** and its facilities and equipment shall comply with **A1.2**.

A2.1.6 The Accreditation Body shall maintain a management review and audit process of its assessors that includes the following:

A2.1.6.1 A periodic monitoring of assessors by peers or other means;

A2.1.6.2 An annual review of assessments; and

A2.1.6.3 An annual review of assessor performance based on customer feedback during the conduct of assessments.

A2.2 Assessment Methods and Procedures

A2.2.1 The Accreditation Body is permitted to use inspection reports from separate Inspection Bodies that comply with **Annex A1**, for the on-site assessment portion of the evaluation.

A2.2.2 If the Accreditation Body performs on-site assessment of facilities and personnel as part of the evaluation, those methods and procedures shall comply with the requirements of **A1.3**.

A2.2.3 The Accreditation Body shall assign an evaluation team with a leader for its evaluation services. The members of the evaluation team shall be qualified and trained for the

services to be performed in accordance with the quality system manual of the Accreditation Body.

A2.2.4 The evaluation team shall review the testing agency's quality manual and conduct an evaluation for conformance with the procedures indicated in the quality manual. The agency's quality manual shall conform to the requirements of this practice.

A2.3 Assessment Reports

A2.3.1 The evaluation report of the Accreditation Body shall include:

A2.3.1.1 An evaluation, including notes on deficiencies requiring corrective action, of the testing agency's quality manual. This shall include an evaluation of the qualifications and testing proficiency of personnel.

A2.3.1.2 An evaluation, including notes of deficiencies requiring corrective action, of conformance to the standard test methods and practices performed by the testing agency, including the adequacy of equipment and facilities.

A2.3.1.3 An evaluation, including notes on deficiencies requiring corrective action, of participation in proficiency sample testing programs.

A2.3.2 The Accreditation Body shall require the testing agency to respond with documentation of investigations made and corrective actions taken to any deficiencies noted in the evaluation report.

A2.3.3 The Accreditation Body shall provide the testing agency a statement on the acceptability of the agency's response and actions taken to address any noted deficiencies. This statement shall be incorporated into the agency's record prior to notification of accreditation.

A2.3.4 The Accreditation Body shall provide a certificate or other means recognizing the accredited status of the testing agency. The materials and standards for which the agency has been evaluated and the duration of the accreditation shall be indicated on the certificate or on other means used to recognize accreditation.

A2.4 Statement of Conformance

A2.4.1 Upon request from the user, the Accreditation Body shall provide a statement indicating conformance with the provisions of this Annex to perform accreditation of testing agencies.

NOTE A2.1—Accreditation Bodies that have documented compliance with ISO 17011 are acceptable provided they comply with the provisions of this Annex.



SUMMARY OF CHANGES

Committee C09 has identified the location of selected changes to this practice since the last issue, C1077–16, that may impact the use of this practice. (Approved October 15, 2016.)

(1) Revised Section 6.

(2) Revised 6.1.1.

Committee C09 has identified the location of selected changes to this practice since the last issue, C1077–15a, that may impact the use of this practice. (Approved Feb. 1, 2016.)

(1) Revised 9.2.7.

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