



# Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection<sup>1</sup>

This standard is issued under the fixed designation E329; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

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

## 1. Scope\*

1.1 This specification defines the minimum requirements for inspection agency personnel or testing agency laboratory agencies engaged in:

- a. Construction inspection of construction and materials used in construction,
- b. Special Inspection, and
- c. Testing of construction and materials used in construction.

1.2 Criteria are provided for evaluating the competence of an agency to properly perform designated tests, inspections, or Special Inspection services. This specification establishes essential characteristics pertaining to the organization, management, personnel, facilities, quality systems, responsibilities, duties, test and inspection methods, records, and reports of the agency. This specification may be supplemented by more specific criteria and requirements if required.

1.2.1 This specification specifically addresses factors relevant to an agency's ability to produce precise, accurate test data or determine the conformity of construction and materials used in construction with regulations, codes, standards, or specifications containing the requirements against which the test or inspection will be performed, or both. Specific or general requirements include:

- 1.2.1.1 Technical competency of personnel,
- 1.2.1.2 Validity and appropriateness of test and inspection methods and procedures,
- 1.2.1.3 Traceability of measurements and calibrations to national standards,
- 1.2.1.4 Suitability, calibration, and maintenance of test equipment,
- 1.2.1.5 Sampling, handling, and transportation of test items,
- 1.2.1.6 Quality assurance of test and inspection data,
- 1.2.1.7 Reporting of test and inspection data or findings, and
- 1.2.1.8 Non Conformance Report (NCR) management and records.

1.3 This specification can be used as a basis to assess an agency and is intended for use in accrediting agencies, public or private, engaged in construction inspection. Special inspection or testing of construction and materials used in construction. These inspection services include but are not limited to reinforced concrete, precast concrete, structural steel erection, welding, bolting, soil and rock, foundations, masonry, sprayed fire-resistive materials, fire stops, exterior insulation and finish system (EIFS), and Special Cases. Building officials can use Specification E329 as a tool in the qualification and establishment of competency of construction inspection, Special inspection, and testing agencies in the fields covered by Specification E329.

1.4 A certificate of accreditation, including the scope of accreditation, is required to comply with this specification.

1.5 The users of an accredited agency must review the agency's scope of accreditation to ensure the agency has been accredited for its technical competence to perform the specific tests or inspections requested by the user.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

A880 [Practice for Criteria for Use in Evaluation of Testing Laboratories and Organizations for Examination and Inspection of Steel, Stainless Steel, and Related Alloys](#)

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee E36 on Accreditation & Certification and is the direct responsibility of Subcommittee E36.70 on Agencies Performing Construction Inspection, Testing and Special Inspection.

Current edition approved June 15, Aug. 1, 2011. Published July September 2011. Originally approved in 1967. Last previous edition approved in 2011 as E329-11a. DOI: 10.1520/E0329-11ab.

<sup>2</sup> 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.

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

C1077 Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

C1093 Practice for Accreditation of Testing Agencies for Masonry

D3666 Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

E4 Practices for Force Verification of Testing Machines

E543 Specification for Agencies Performing Nondestructive Testing

E605 Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members

E736 Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members

E994 Guide for Calibration and Testing Laboratory Accreditation Systems General Requirements for Operation and Recognition

E1513 Practice for Application of Sprayed Fire-Resistive Materials (SFRMs)

E2174 Practice for On-Site Inspection of Installed Fire Stops

E2393 Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

2.2 AASHTO Standard:

R18 Standard Recommended Practice for Establishing and Implementing a Quality System for Construction Materials Testing Laboratories<sup>3</sup>

2.3 ANSI/ISO/IEC Standard:

17020 General Criteria for the Operation of Various Types of Bodies Performing Inspection<sup>4</sup>

17025 General Requirements for the Competence of Calibration and Testing Laboratories<sup>4</sup>

2.4 AWS Documents:<sup>5</sup>

B1.11 Guide for the Visual Inspection of Welds

D1.1 Structural Welding Code, Steel

D1.4 Structural Welding Code—Reinforcing

D1.5 Bridge Welding Code

2.5 SJI Documents:<sup>6</sup>

Recommended Code of Standard Practice for Steel Joists and Joist Girders

### 3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 accreditation, *n*—the third-party attestation of an agency competence to perform inspection, testing services, or both.

3.1.1.1 accreditation body, *n*—the body that administers the accreditation program and issues the certificate of accreditation.

3.1.1.2 accreditation scope, *n*—the formal statement issued by the accreditation body to the agency that describes the specific tests, inspections, or both for which the agency has demonstrated a competency in performing and is accredited.

3.1.1.3 Discussion—A certificate of accreditation shall identify the agency and its location along with the accreditation body, the accreditation standard, the general field testing or inspection, effective dates, conditions and authorized signatures, seals, or combinations thereof, of the accreditation body. This must be accompanied by an accreditation scope to fully describe the technical competence of an agency.

3.1.2 agency, *n*—the organization, or part thereof, authorized by the project sponsor or his duly authorized representative to inspect, test, or both, construction and materials used in construction as required by the project specifications.

3.1.2.1 inspection agency, *n*—an agency that makes visual observations and field measurements of construction or materials used in construction, or both. It may collect and submit samples, identified with respective portions of the construction, for laboratory evaluation. The inspection agency/body/agency and testing agency may be one organization or separate organizations.

3.1.2.2 Special Inspection agency, *n*—an accredited third-party inspection agency approved by the applicable building official to perform Special Inspections.

3.1.2.3 Special Inspector, *n*—a person employed by a Special Inspection Agency and approved by the applicable building official, certified by a third party to perform certain types of inspection as required by the applicable building code.

3.1.2.3.1.2.4 testing agency, *n*—an agency that measures, samples, examines, tests, or otherwise determines the characteristics or performance of materials used in construction.

3.1.3 bituminous material and mixtures, *n*—as used in construction, all types of asphalts and tars for pavements.

3.1.3.1 Discussion—Bituminous mixtures are bituminous stabilized soil, base course, binder, leveling, surface course, and mastic mixtures. Bituminous mixtures may contain asphalt binder material which, in some cases, may be further modified with other additive materials to produce special properties.

<sup>3</sup> Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, <http://www.transportation.org>.

<sup>4</sup> 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>.

<sup>5</sup> Available from American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126, <http://www.aws.org>.

<sup>6</sup> Available from Steel Joist Institute (SJI), 3127 Mr. Joe White Ave., Myrtle Beach, SC 29577-6760, <http://www.steeljoist.org>.

3.1.4 *concrete, n*—as used in construction, a mixture of hydraulic cement, aggregates, and water, with or without admixtures, fibers, or other cementitious materials.

3.1.5 *contract*—the contractual agreement between the agency and the project sponsor.

3.1.6 *documentation, n*—unless otherwise specified, the term documentation, and related terms such as the verb “document,” refer herein to written documentation.

3.1.6.1 *Discussion*—Documentation other than written documentation, such as video or audio recordings, shall be used, where appropriate, in addition to written documentation, if possible.

3.1.7 *engineer, n*—the term “engineer,” when used in combination with the terms “registered,” “licensed,” or “professional” are to be considered interchangeable for the purposes of clarification.

3.1.7.1 *Discussion*—Governmental jurisdiction may differ in the title, but the definition and intent are the same.

3.1.8 *inspection, n*—as used in construction: a visual observation or measurement of construction activities or materials used in construction, to determine general compliance to the project specification.

3.1.8.1 *Special Inspection, n*—this unique term applied to the process of inspection or monitoring of specific materials, equipment, installation, fabrication, erection or placement of components and connections by individuals with special expertise as approved by the building official to ensure compliance with the approved contract documents.

3.1.9 *inspector/technician, n*—an employee of the inspection or testing agency or both assigned to perform the actual services of construction inspection or testing of materials used in construction or both:

3.1.9.1 *Special Inspector, n*—a person employed by a Special Inspection Agency and approved by the applicable building official, certified by a third party to perform certain types of inspection as required by the applicable building code.

3.1.10 *main facility, n*—a structure with a permanent address, which provides testing or inspection services, or both, for multiple projects for a period expected to be greater than three years.

3.1.10.1

3.1.9.1 *sub-facility, n*—a structure with a permanent address, that is physically separate from, but considered an extension of the main facility, which generally provides testing and/or inspection services or both for multiple projects.

3.1.10.23.1.9.2 *site facility, n*—a structure, or a mobile, fully-equipped, self-contained unit, capable of conducting specific tests and/or inspections, or inspections or both, established in a dedicated area on-site for the duration of a specific project, but not for projects expected to exceed three years.

3.1.10.33.1.9.3 *temporary, adj*—as used to describe testing and/or inspection facilities, as used to describe testing or inspection facilities or both, expected to function for a period not to exceed three years.

3.1.10.4

3.1.9.4 *permanent, adj*—as used to describe testing or inspection facilities, or both, expected to function for a period exceeding three years.

3.1.11

3.1.10 *masonry, n*—as used in construction, masonry units, brick, mortar and grout used in construction.

3.1.11.1

3.1.10.1 *Discussion*—The masonry construction may be load bearing or non-load bearing.

3.1.12

3.1.11 *nondestructive testing, n*—procedures for testing construction or materials used in construction or both, that does not impair the serviceability of the materials or assemblies under test.

3.1.12.1

3.1.11.1 *Discussion*—Nondestructive testing includes all test methods that do not impair the serviceability of the material, part, or assembly under test. Nondestructive tests are specific. They usually reveal only the specific kinds of defects and conditions for whose detection they were designed. Consequently, they must be selected in accordance with the specific materials, the specific conditions to be detected, and the specific job to be done.

3.1.13

3.1.12 *owner, n*—the owner’s officer, the engineer, or the architect responsible for the work, or his duly recognized or authorized representative.

3.1.14

3.1.13 *project sponsor, n*—the organization that retains the agency, and normally, the owner of record when the project is complete.

3.1.15

3.1.14 *soil, n*—as used in construction, subgrade, subbase, base, select fill and other similar types of granular and non-granular soils used in construction regardless of whether it is considered as a structural element in the project or general fill not supporting structural elements.

3.1.16

3.1.15 *steel, n*—as used in construction, structural steel plates and shapes used wholly or in part for structures including reinforcing steel used in concrete.

3.1.16.1

3.1.15.1 *Discussion*—It is not intended to include steels used in conjunction with mechanical, electrical, heating or air-conditioning equipment except for the supporting structures.

3.1.16 *technician, n*—an employee of the agency assigned to perform the actual services of construction inspection or testing of materials used in construction or both.

3.1.17 *testing*—a technical procedure performed on construction activities or materials used in construction with specified equipment that produces data unique to the construction activities or materials; the data are used to evaluate or determine selected properties or characteristics of the activities or materials.

#### 4. Significance and Use

4.1 The testing and inspection of construction and the materials in construction is an important element in obtaining quality construction in general compliance to the contract documents. A construction inspection, Special Inspection or testing agency, or both, must be selected with care after a comprehensive evaluation of their competency to perform the services properly and in compliance with the applicable building code.

4.2 This specification provides basic minimum criteria for use in evaluating the qualifications of technically oriented construction inspection, Special Inspection, or testing agency. The criteria may be supplemented by more specific criteria and requirements for particular classes of testing or types of inspection agencies. An individual user can also use it to judge the competency of an agency.

4.3 The intent of this specification is to provide a consensus system standardized basis for requirements for a technically oriented construction inspection, Special Inspection, or testing agency, with respect to the agency's capability to objectively and competently provide the specific services without prejudice.

4.4 Typically, assessing an agency involves the following three essential sequential phases:

4.4.1 Submittal of basic information in accordance with the criteria of this specification to the evaluator by an agency desiring to be qualified to this specification,

4.4.2 Assessing the agency-submitted information from the accreditation body, and

4.4.3 On-site assessment of the agency by the accreditation body.

#### 5. Organization and Management

5.1 The agency shall be legally identifiable. It shall be organized and shall operate in such a way that its facilities meet the requirements of this specification.

5.1.1 Main facilities, sub-facilities, and permanent site facilities shall maintain personnel, equipment, procedures, and documentation as required in this specification. The manager for the main facility may also be responsible for a sub-facility or permanent site facility (see 6.2.2 and 6.3.2). Main facilities, sub-facilities, and permanent site facilities shall be accredited in accordance with 9.4.1 to perform the functions described in 3.1.2.1 or 3.1.2.2 or 3.1.2.3-3.1.2.4 of this specification.

5.1.2 Temporary site facilities offering a defined scope of services for a specific project, which are demonstrably under the main facility's or sub-facility's technical direction and quality program, do not require separate accreditation. Agencies that use temporary site facilities for their projects shall describe the operation of these facilities in their quality manual.

5.1.3 An endorsement for the operation of temporary site facilities shall also be listed on the agency's accreditation certificate.

5.2 The agency shall:

5.2.1 Have managerial personnel with the authority and resources needed to discharge their duties.

5.2.2 Have arrangements to ensure that its personnel are free from any commercial, financial, and other pressures including trade organization rules that might adversely affect their independence of judgments and the integrity of their services. A Special Inspection agency or its personnel shall not be directly involved in the manufacture, supply, installation, use, or maintenance of the inspected items.

5.2.3 Be organized in such a way that confidence in its independence of judgment and integrity is maintained at all times.

5.2.4 Specify and document the responsibility, authority, qualifications, and interrelation of all personnel who manage, perform, or verify services affecting the quality of inspections or tests, or both.

5.2.5 Provide supervision by persons qualified to perform the inspections and tests and to implement relevant procedures. They shall be qualified to evaluate the objective of the inspections or tests and the results. The ratio of supervisory to non-supervisory personnel shall be such as to ensure adequate supervision.

5.2.6 Have a technical manager (however named) who has overall responsibility for the technical operations.

5.2.7 Have a quality manager (however named) who has the responsibility for the quality system and its implementation. The quality manager shall have direct access to the highest level of management at which decisions are made on agency policy or resources, and to the technical manager. In some agencies, the quality manager may also be the technical manager or deputy technical manager.

5.2.8 Nominate deputies in case of absence of the technical or quality manager.

5.2.9 Where relevant, have documented policy and procedures to ensure the protection of clients' confidential information and proprietary rights.

5.2.10 Where appropriate, as determined by the agency's quality manual, participate in interlaboratory comparisons and proficiency testing programs.

## 6. Personnel

### 6.1 General

6.1.1 The agency shall have sufficient personnel having the necessary education, training, technical knowledge, certification as appropriate, and experience for their assigned functions.

6.1.2 The agency shall ensure that the training of its personnel is kept up-to-date.

6.1.3 Records of relevant certification, qualifications, training, skills, and experience of the technical personnel shall be maintained by the agency.

### 6.2 Construction Inspection and Testing Agency, or Both

6.2.1 The following personnel requirements must be satisfied by the agency when construction inspection or testing services, or both, are being provided:

6.2.2 The inspection and testing services of the agency, that provides the quality control or quality assurance program, or both, as related to construction or materials used in construction, shall be under the direction of a person charged with engineering managerial responsibility. The person shall be a licensed/registered design professional and a full-time employee of that agency. The person shall have at least five years experience in testing and inspection of construction materials. The organization may consist of one or more separate facilities providing inspection or testing services or both. A licensed/registered design professional may have engineering managerial responsibility for one or more facilities within the organization.

6.2.3 When a producer's or manufacturer's laboratory only serves as a quality control laboratory and does not produce tests for acceptance, payment, or the official record, the requirement for a registered professional is waived. However, the laboratory function of the organization shall be supervised by a quality control manager. The quality control manager shall have at least five years experience in testing of that particular construction material, and be a full time employee of the organization. The quality control manager will have the authority to make changes in production to ensure that quality material is produced. He may serve as the quality control manager for several materials production facilities. The quality control manager shall have the certifications appropriate to the testing of the materials supervised.

6.2.4 A laboratory supervisor shall have at least three years experience performing tests on relevant construction materials. This person shall be able to demonstrate either by oral or written examination, or both, their ability to perform the tests normally required in the manner stipulated under ASTM or other governing test procedures and shall be capable of evaluating the test results in terms of specification compliance. Certification by qualified national, regional, or state authorities as appropriate to the services is required.

6.2.5 A field supervisor shall have at least three years inspection experience in the type of services being supervised. This person shall be able to demonstrate, either by oral or written examination, or both, their ability to perform correctly the required duties and shall be capable of evaluating the inspection or test results in terms of specification compliance. Certification by qualified national, regional, or state authorities as appropriate to the services is required.

6.2.6 *Inspector or Technician*—This person shall have sufficient education and on-the-job training or trade school training to properly perform the test or inspection to which the person is assigned. This person must be able to demonstrate competence for the test or inspection which is being conducted either by oral or written examination, or both. Certification as appropriate for the services being performed, or certification by other qualified national authorities as appropriate to the work, shall be considered as one means of documenting competency. The inspector or technician shall work under the direct supervision of personnel meeting the requirements of 6.2.4 or 6.2.5.

6.2.7 It is satisfactory for a person to fill one or more of the levels of management, supervision, inspector, or technician positions in accordance with 6.2.2, 6.2.3, 6.2.4, and 6.2.5, provided the person qualifies for the highest level worked. It is also recognized that frequently some tests and inspections are conducted at small field or peripheral locations; it is not the intent of this specification that the supervisory personnel be directly present at such locations at all times. If the qualified person in 6.2.2 performs as a supervisor, they do not have to comply with the certification requirements.

### 6.3 Special Inspection Agency

6.3.1 The following personnel requirements must be satisfied by an agency that provides Special Inspection services:

6.3.2 The Special Inspection services of the agency shall be under the direction of a licensed/registered design professional and a full-time employee of that agency. The person shall have at least two years experience in Special Inspections. The organization can consist of one or more separate facilities providing Special Inspection. A licensed/registered design professional can have engineering managerial responsibility for one or more facilities within the organization as defined by Section 5.

6.3.3 The qualifications of the field supervisor shall be determined by the applicable building official. If no requirements have been set forth, the following shall apply:

6.3.3.1 A field supervisor of Special Inspection shall have at least two years Special Inspection experience in the type of work being supervised. This person shall be certified in the areas he or she is supervising.

6.3.3.2 The qualifications of the Special Inspector shall be determined by the local building official. If no requirements have been set forth, the following shall apply:

6.3.3.3 A Special Inspector shall be certified by a third party. This certification exam shall include; a written examination which shall include reading plans as a performance element. The examination shall demonstrate the candidate's ability to correctly perform the required duties and evaluate the inspection results for specification and code compliance.

6.3.3.4 The licensed/registered design professional according to 6.3.2, in addition to the requirements of 6.3.3.2 shall document the experience and job training of each Special Inspector under his supervision. The design professional shall maintain such documentation for a minimum of three years after the individual(s) have left their employment.

6.3.4 A person can fill one or more of the levels of management, supervision, inspector, or technician positions in accordance with 6.3.2-6.3.3.1, provided the person qualifies for the highest level worked.

## **7. Equipment**

7.1 The agency shall furnish all items of equipment, including reference materials, required for the correct performance of inspections and tests. In those cases where the agency needs to use equipment outside its permanent control, it shall ensure that the relevant requirements of this specification are met.

7.2 All equipment shall be properly maintained. Maintenance procedures shall be documented and shall include a schedule for future maintenance.

7.2.1 Any equipment that has been subjected to overloading or mishandling, or that gives suspect results, or has been shown by verification or otherwise to be defective, shall be taken out of service, clearly identified, and wherever possible, stored at a specified place until it has been repaired and shown by calibration, verification, or test to perform satisfactorily.

7.2.1.1 The agency shall examine the effect of this defect on previous inspections or tests.

7.3 Each item of equipment including reference materials shall, when appropriate, be labeled, marked or otherwise identified to indicate its calibration status.

7.4 Records shall be maintained for each item of equipment and all reference materials significant to the inspections or tests performed. The records shall include:

7.4.1 The name of the item of equipment,

7.4.2 The manufacturer's name, type identification, and serial number or other unique identification,

7.4.3 Date received and date placed in service,

7.4.4 Condition when received (for example, new, used, reconditioned, and so forth),

7.4.5 Copy of the manufacturer's instructions, where available, condition when received (for example, new, used, reconditioned, and so forth),

7.4.6 Details of maintenance carried out to date,

7.4.7 Dates and results of calibrations or verifications, or both, and date of next calibration or verification, or both,

7.4.8 History of any damage, malfunction, or repair, and

7.4.9 Current location.

## **8. Quality System, Audit and Review**

8.1 The agency shall establish and maintain a quality system appropriate to the type, range, and volume of inspections and testing activities it undertakes. The elements of this system shall be documented. The quality documentation shall be available for use by the agency's personnel.

8.1.1 The agency shall define and document its policies and objectives for, and its commitment to good practice and quality of, inspection or testing services.

8.1.2 The agency management shall ensure that these policies and objectives are documented in a quality manual and communicated to, and understood and implemented by all personnel concerned. The quality manual shall be maintained current under the responsibility of the quality manager.

8.2 The quality manual, and related quality documentation, shall state the agency's policies and operational procedures established in order to meet the requirements of this specification. The quality manual and related quality documentation shall also contain:

8.2.1 A quality policy statement, including objectives and commitments, by top management,

8.2.2 The organization and management structure of the agency, its place in any parent organization and relevant organizational charts,

8.2.3 The relations between management, technical operations, support services, and the quality system,

8.2.4 Procedures for control and maintenance of documentation,

8.2.5 Job descriptions of key personnel and reference to the job descriptions of other personnel,

8.2.6 Identification of the agency's approved signatories (where this concept is appropriate),

8.2.7 The agency's procedures for achieving traceability of measurements,

8.2.8 The agency's scope of inspections or tests, or both,

8.2.9 Arrangements for the agency to review all new services to ensure that it has the appropriate facilities and resources before commencing such services,

8.2.10 Reference to the test procedures used,

8.2.11 Procedures for handling inspection and test items,

8.2.12 Reference to the equipment and reference measurement standards used,

8.2.13 Reference to procedures for calibration, verification and maintenance of equipment,

8.2.14 Procedures to be followed for feedback and corrective action whenever testing discrepancies are detected, or departures