



Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection¹

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

1. Scope*

1.1 This specification defines the minimum requirements for agencies engaged in any of the following:

- (a) Inspection of specified methods and materials used in construction,
- (b) Special Inspection, and
- (c) Testing of materials used in construction.

1.2 Criteria are provided for assessing the competence of an agency to properly perform designated inspections, tests, or Special Inspection services. This specification establishes essential characteristics pertaining to the organization, management, personnel, facilities, quality systems, responsibilities, duties, inspection and testing 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 activities and materials used in construction with regulations, codes, standards, and approved project plans and specifications containing the requirements against which the inspection or test, or both, will be performed. Specific or general requirements include:

- 1.2.1.1 Facilities and management of the agency,
- 1.2.1.2 Sufficiency and technical competency of personnel,
- 1.2.1.3 Suitability, calibration, and maintenance of equipment,
- 1.2.1.4 Quality system, audit, and review,
- 1.2.1.5 Responsibilities, duties, and authority of agencies,

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1.2.1.6 Validity and appropriateness of sampling, testing, and inspection methods and procedures,

1.2.1.7 Management of records,

1.2.1.8 Reporting, review, and transmission of test and inspection data or findings, and

1.2.1.9 Specific requirements for identified fields (concrete, soil, etc.).

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 inspection, testing, and Special Inspection of construction activities and materials used in construction. These services include but are not limited to reinforced concrete, precast concrete, structural steel erection, welding, bolting, soil and rock, foundations, masonry, sprayed fire-resistant materials, fire stops, exterior insulation and finish system (EIFS), and Special Cases. Building officials can use Specification E329 to assess the competency of 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 inspections or tests requested by the user.

1.6 This specification is not intended to:

- (a) circumvent or replace the agreement between the agency and the owner that should clearly define the responsibilities and authorities of the agency;
- (b) address design requirements that supersede applicable codes, laws, and regulations; or
- (c) address construction means, methods, techniques, or sequences.

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

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

Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:²

- 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/E605M** Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members
- E736/E736M** Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
- E814** Test Method for Fire Tests of Penetration Firestop Systems
- E1513/E1513M** Practice for Application of Sprayed Fire-Resistive Materials (SFRMs)
- E1966** Test Method for Fire-Resistive Joint Systems
- E2174** Practice for On-Site Inspection of Installed Firestop Systems
- E2307** Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
- 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 Laboratories³

2.3 ANSI/ISO/IEC Standard:⁴

- 17011** General Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies
- 17020** General Criteria for the Operation of Various Types of Bodies Performing Inspection
- 17025** General Requirements for the Competence of Calibration and Testing Laboratories

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.

³ 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>.

⁴ 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>.

2.4 AWS Documents:⁵

- 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:⁶

- Recommended Code of Standard Practice for Steel Joists and Joist Girders

2.6 Other Referenced Documents:

- 2018 International Building Code® (IBC)⁷
- UL 2079 Tests for Fire Resistance of Building Joint Systems⁸

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *accreditation, n*—the third-party attestation of an agency's competence to perform inspection, or 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 inspections, tests, 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(s) of inspection or testing, effective dates, conditions and authorized signatures, seals, or combinations thereof, of the accreditation body. The certificate must be accompanied by an accreditation scope to fully describe the technical competence of the agency.

3.1.2 *agency, n*—the organization, or part thereof, authorized by the client or client's duly authorized representative to inspect, test, or both, construction activities and materials used in construction as required by the approved project plans and specifications.

3.1.2.1 *inspection agency, n*—an agency that uses technical procedures and individuals with special expertise to perform inspection activities.

3.1.2.2 *Discussion*—Agency personnel may collect and submit samples, identified with respective portions of the construction, for laboratory evaluation. The inspection agency and testing agency may be one organization or separate organizations.

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

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

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

⁷ Available from the International Code Council, Inc. 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001, https://codes.iccsafe.org/content/IBC2018?site_type=public

⁸ Available from UL LLC 333 Pfingsten Rd, Northbrook, IL 60062, https://standardscatalog.ul.com/standards/en/standard_2079

3.1.2.4 *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.

3.1.2.5 *testing agency, n*—an agency that uses technical procedures, individuals with special expertise, and specified equipment to measure, sample, examine, test, or otherwise produce data unique to the construction activities or materials used in construction. The inspection agency and testing agency may be one or separate organizations.

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 include 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.

3.1.4 *client, n*—the party that contracts with the agency to perform its services.

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

3.1.6 *contractual agreement*—the legally-binding service contract between the agency and the agency's client.

3.1.6.1 *Discussion*—The *contractual agreement* referred to throughout this document may include *testing, inspection, or Special Inspection services contracts*.

3.1.7 *engineer, professional, n*—an individual who is registered or licensed to engage in the practice of engineering as defined by the statutory requirements of the professional registration or licensing laws of the state or jurisdiction in which the project is to be constructed.

3.1.8 *inspection, n*—a technical procedure based on visual observation or field measurement of construction activities or materials used in construction employed to evaluate activities or materials and determine general compliance with approved project plans and specifications.

3.1.8.1 *Special Inspection, n*—the 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 applicable building official to ensure compliance with the approved project plans and specifications.

3.1.9 *inspector/technician, n*—a person employed by the agency assigned to perform the inspection or testing of construction activities or materials used in construction or both.

3.1.10 *facility, main, 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 *facility, site, n*—a structure, or a mobile, fully-equipped, self-contained unit, capable of conducting specific tests 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.

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

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

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

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

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

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

3.1.12.1 *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 *registered design professional, n*—an individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

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

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.

3.1.15.1 *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 *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 inspection and testing of construction activities and the materials used in construction are important elements in obtaining quality construction in general compliance with the

contract documents. An agency providing construction inspection, testing, or Special Inspection, must be selected with care after a comprehensive evaluation of their competency to perform the services properly and in compliance with the approved project plans and specifications.

4.2 This specification provides minimum criteria for use in assessing the qualifications of construction inspection, testing, and Special Inspection agencies. 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 standardized basis for requirements for a technically oriented construction inspection, testing, or Special Inspection 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 accreditation body by an agency desiring to be accredited to this specification,

4.4.2 Assessment of the agency-submitted information by 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 3.1.2.3 or 3.1.2.5 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, their judgment, 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:

6.2.1 The following personnel requirements must be satisfied by the agency when 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 activities or materials used in construction, shall be under the direction of a person charged with engineering managerial responsibility. The person shall be a professional engineer and a full-time employee of that agency. The person shall have at least five years experience in inspection and testing of construction activities and materials used in construction. The organization may consist of one or more separate facilities providing inspection or testing services

or both. A professional engineer 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 professional engineer 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 in relevant construction activities and materials used in construction. 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 inspection or test to which the person is assigned. This person must be able to demonstrate competence for the test or inspection that 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 service, 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 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 registered design professional can have 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 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.

6.3.4 The qualifications of the Special Inspector shall be determined by the applicable building official. If no requirements have been set forth, the Special Inspector shall be certified by a third party. This certification exam shall include; a written examination that 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.

6.3.5 The registered design professional according to 6.3.2, in addition to the requirements of 6.3.4 shall document the experience and job training of each Special Inspector being supervised. The Special Inspection agency shall maintain such documentation for a minimum of three years after the individual(s) have left their employment.

6.3.6 A person can fill one or more of the levels of management, supervision, inspector, or technician positions in accordance with 6.3.2 – 6.3.4, 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 from documented policies and procedures occur;

8.2.15 The agency's arrangements for permitting departures from documented policies, procedures, or standards;

8.2.16 Procedures for dealing with complaints;

8.2.17 Procedures for protecting confidentiality and proprietary rights; and

8.2.18 Procedures for audit and review.

8.3 The agency shall arrange for audits or inspections of its activities at appropriate intervals to verify that its operations continue to comply with the requirements of the quality system. Such audits shall be carried out by qualified personnel who are independent of the activity to be audited.

8.3.1 If the audit findings cast doubt on the correctness or validity of the agency's inspections or test results, the agency shall investigate the findings and circumstances to determine if the agency's inspection or test results reported to the client and other parties were affected. If the agency's investigation determines that the agency's inspection or test results were affected, the agency shall take immediate corrective action and shall immediately notify, in writing, the client and any other party as required by the contractual agreement.

8.4 The quality system adopted to satisfy the requirements of this specification shall be reviewed at least once a year by the management to ensure its continuing suitability and effectiveness and to introduce any necessary changes or improvements.

8.5 All audit and review findings, external and internal, and any corrective actions that arise from them shall be documented. The person responsible for quality shall ensure that these actions are discharged within the agreed timescale.

8.6 In addition to periodic audits, the agency shall ensure the quality of results provided to clients by implementing checks. These checks shall be reviewed and shall include, as appropriate, but are not limited to:

8.6.1 Internal quality control schemes using, whenever possible, statistical techniques,

8.6.2 Participation in proficiency testing or peer reviews,

8.6.3 Regular use of certified reference materials or in-house quality control using secondary reference materials, or both,

8.6.4 Replicate inspections or testing using the same or different methods,

8.6.5 Re-inspection or re-testing of retained items, and

8.6.6 Correlation of results for different characteristics of an item.

9. Responsibilities and Duties

9.1 It shall be the responsibility of the agency to ensure that it performs only inspections or tests for which it is adequately equipped and staffed, and that its personnel perform only inspections or tests for which they are adequately trained.

9.2 The following duties are those usually performed by the agency:

9.2.1 Obtain representative samples of those materials required by the approved project plans and specifications, and authorized by the contractual agreement to be tested and evaluated.

9.2.2 When samples are collected by the agency, the agency must ensure that there is proper protection, handling, and storing of the samples to ensure that they remain representative of the material being used at the time of sampling.

9.2.3 When the agency is responsible for collecting samples, the samples must be identified with the respective portions of the work in which the material represented was or will be used.

9.2.4 Perform all testing and inspection operations in accordance with appropriate standards as referenced in the contractual agreement.

9.2.5 Call to the attention of the client any irregularities or deficiencies in the construction materials or processes, or both, as related to construction materials, that the contractual agreement specifically states the agency is responsible for testing or inspecting.

9.2.6 Submit promptly to the client and distribute as specified in the contractual agreement formal reports of all tests and inspections which indicate compliance or noncompliance with the approved project plans and specifications. The reports shall be complete and factual, citing the methods used in obtaining samples, the tests performed, the specified values for the measured characteristics, the values obtained, the parts of the structure involved, and similar pertinent data. The agency shall be prepared to substantiate its reports to the extent necessary.

9.3 Unless specifically authorized, the agency does not have the right of rejection.

9.4 The agency shall have its laboratory procedures and equipment inspected at intervals of not more than three years by a qualified national authority as evidence of its competence to perform the required tests.

9.4.1 The agency shall demonstrate evidence of meeting the requirements of Specification E329 through accreditation in the field of its operations by a recognized accreditation authority. ANSI/ISO/IEC Standards 17011 can be used to evaluate the credentials, qualifications, and operation of the accreditation body.

9.5 The agency shall supply the qualified accreditation authority with the qualification of its Personnel as listed in Section 6. At a minimum each person shall be re-evaluated internally or externally, at least every three years for each test or inspection or both the person is authorized to perform.

10. Inspections and Test Methods

10.1 The agency shall have documented instructions on the use and operations of all relevant equipment, on the handling and preparation of items, and for inspection, calibration, or testing, or a combination thereof, where the absence of such instructions could jeopardize the inspections or tests. All instruction, standards, manuals and reference data relevant to

the services of the agency shall be maintained up-to-date and be readily available to the personnel and external auditors.

10.2 The agency shall use appropriate test methods and procedures for all inspections and tests and related activities within its responsibility (including sampling, handling, transport and storage, and preparation of items, estimation of uncertainty of measurement, and analysis of inspection data or test data, or both). They shall be consistent with the accuracy required, and with any standard specifications relevant to the inspections, or tests concerned.

10.3 Where test methods are not specified, the agency shall, whenever possible, select test methods that have been published as international or national standards, those published by reputable technical organizations or in relevant scientific texts or journals.

10.4 Where it is necessary to employ test methods that have not been established as standards, these shall be subject to agreement with the client, be fully documented and validated, and be available to the client and other recipients of the relevant reports.

10.5 Where sampling is carried out as part of the test method, the agency shall use documented procedures and appropriate statistical techniques to select samples.

10.6 Calculations and data transfers shall be subject to appropriate checks.

10.7 Where computers or automated equipment are used for the capture, processing, manipulation, recording, reporting, storage, or retrieval of inspection or test data, the agency shall ensure that:

10.7.1 All requirements of this specification are complied with,

10.7.2 Computer software is documented and adequate for use,

10.7.3 Procedures are established and implemented for protecting the integrity of data; such procedures shall include, but are not limited to: the integrity of data entry or capture, data storage, data transmission and data processing,

10.7.4 Computer and automated equipment is maintained to ensure proper functioning and provided with the environmental and operating conditions necessary to maintain the integrity of inspection and test data, and

10.7.5 Appropriate procedures for the maintenance of security of data including the prevention of unauthorized access to, and unauthorized amendment of, computer records are established and implemented.

10.8 Documented procedures shall exist for the purchase, reception and storage of consumable materials used for the technical operations of the agency.

11. Records

11.1 The agency shall establish and maintain a documented system to identify, collect, index, access, file, store, maintain, and dispose of management and technical records to suit its particular circumstances and to comply with applicable regulations.