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An American National Standard

# Standard Specification for Agencies Engaged in System Analysis and Compliance Assurance for Manufactured Building[1]

This standard is issued under the fixed designation E541; 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.

## 1. Scope*

1.1 This specification was initiated to meet the needs of regulatory programs for the certification of manufactured building. The various statutes differ somewhat in the responsibilities assigned to the administrative agency responsible for implementing the rules and regulations for manufactured building. The administrative agency may utilize the services and facilities of building-evaluation agencies in carrying out its responsibilities for evaluating manufactured building systems. By providing criteria for evaluating these agencies, this specification's objective is to (*1*) utilize the voluntary standards system to provide a common base for the various regulatory approaches employed by the authorities having jurisdiction, and (*2*) make provision for varying degrees of optional technical support for the certification of manufactured building.

1.2 To establish an appropriate degree of intra- and interstate credibility regarding building system evaluations made through governmental or private agencies, the authorities having jurisdiction may wish to utilize an accreditation program for such agencies.

1.3 Building-evaluation organizations examined under this specification may include both governmental and private agencies qualified to act on behalf of the public as designee agents (that is, agencies) of the government office having jurisdiction.

1.4 This specification covers criteria by which the technical resources of agencies, both governmental and private, may be evaluated for their capability to perform the system analysis or compliance assurance function, or combination thereof, in the evaluation and inspection (certification) of manufactured building. Practice E651/E651M may be used for the evaluation of such agencies.

1.5 These criteria set forth the minimum personnel requirements and the technical and organizational procedures required for agencies engaged in evaluating manufactured building. Other criteria such as independence, financial stability, and objectivity may need to be considered.

1.6 Criteria are included for agencies evaluating innovative as well as conventional building systems, against applicable requirements.

1.7 Agencies involved in testing, quality assurance and evaluating building components can be evaluated by using Practice E699.

1.8 *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]

E651/E651M Practice for Evaluating Capabilities of Agencies Involved in System Analysis and Compliance Assurance for Manufactured Building

E699 Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components

## 3. Terminology

3.1 *Definitions:*

3.1.1 *administrative agency (user agency)*—a generic name for the authority having jurisdiction charged with administering the legislation, act, or other responsibility.

3.1.2 *agency*—an organization acting as designee agent of the administrative agency in the regulation of manufactured building.

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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.

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

3.1.3 *applicable requirements*—the specific material and performance specifications included in designated codes, standards, and approved documents. They may include special requirements adopted by the administrative agency or other jurisdictions.

3.1.4 *building-evaluation agencies*—a collective term for the group of agencies that perform one or more of the building-evaluation services of systems analysis and compliance assurance.

3.1.5 *closed construction*—any building, building assembly, or system manufactured in such a manner that concealed parts or processes of manufacture cannot be inspected at the building site without disassembly, damage, or destruction.

3.1.6 *compliance assurance*—the process of appraising the manufacturer's compliance control program in conjunction with monitoring or auditing and inspection of production, implemented to provide objective evidence that the manufactured building conforms to the approved documents.

3.1.6.1 *Discussion*—In conventional construction the compliance assurance function roughly corresponds to field inspection of construction to ensure that the building is constructed in accordance with the approved plans.

3.1.7 *compliance assurance manuals*—a document employed as part of the manufacturer's compliance control program for the purpose of periodic monitoring, surveillance, or audit by the manufacturer and the compliance assurance agency of the manufacturer's production and product compliance programs.

3.1.8 *compliance control manual*—a document prepared by the manufacturer detailing the methods, procedures, and systems employed in the compliance control program.

3.1.9 *compliance control program*—the manufacturer's system, including directly related quality and process controls, for assuring compliance with applicable codes and standards and approved documents.

3.1.10 *criteria*—the minimum standards or limits on which judgments may be based.

3.1.11 *manufactured buildinga*—any building or mobile home that is of closed construction and that is made or assembled in manufacturing facilities, on or off the building site, for installation, or assembly and installation, on the building site. Manufactured building also means any building of open construction for which certification is sought by the manufacturer and that is made or assembled in manufacturing facilities away from the building site, for installation, or assembly and installation, on the building site.

3.1.12 *open construction*—any building, building assembly, or system manufactured in such a manner that all portions can be readily inspected at the building site without disassembly, damage, or destruction.

3.1.13 *service equivalent*—the experience that an individual has accumulated in the engineering or arthitectural discipline(s) involved that serves as a substitute for academic requirements. In general, eight years of experience in engineering or architectural practice indicative of growth in engineering or architectural competency and responsibility are considered an alternative to the engineering or architectural education requirements.

3.1.14 *system analysis*—the process employed to determine whether a proposed manufactured building conforms to applicable requirements.

3.1.14.1 *Discussion*—In conventional construction the system analysis function roughly corresponds to plan review and approval by the authority having jurisdiction.

## 4. Requirements and Criteria for System Analysis Agencies

4.1 The system analysis agency is responsible for determining whether a building system, including the design, materials, and fabrication process, is in conformance with applicable requirements. The agency shall be capable of performing the following steps, where applicable, in the system analysis function:

4.1.1 Project management,
4.1.2 Preliminary meeting,
4.1.3 Submission of documents,
4.1.4 Staffing,
4.1.5 Evaluation of prescribed systems,
4.1.6 Evaluation of performance specifications,
4.1.7 Evaluation of innovative systems,
4.1.8 Evaluation of compliance assurance manuals,
4.1.9 Evaluation of installation documents, and
4.1.10 Factory visit (this may be included in compliance assurance function).

## 5. Documents of the System Analysis Function

5.1 The criteria herein are based on the following basic documents:

5.1.1 Product description document.
5.1.2 Compliance assurance manual.
5.1.3 Installation document.

5.2 The first and third documents are prepared by the manufacturer and submitted for processing through the system analysis agency.

5.3 The manufacturer's compliance control program is submitted for review by the compliance assurance agency. This program forms the basis for preparation of, and is incorporated into, a compliance assurance manual containing a description of the building, required production tests, compliance procedures, and any other information that is needed to guide and assist the compliance assurance agency in determining that production units continue to comply with requirements.

## 6. General Procedure for System Analysis

6.1 *Task*—To provide a description of the general procedures for system analysis, which includes as a minimum the activities described in 6.2.

6.2 *Requirements:*

6.2.1 Drawings, calculations, test reports and specifications of manufactured building shall be reviewed by the agency's engineering staff and details compared with provisions of applicable requirements. The construction of assemblies or

components, or both, including material identification, shall be compared with published descriptions of listed, approved, or recognized designs where applicable.

6.2.2 Where production has been instituted, and subsequent to the review of drawings and specifications, qualified personnel from the system analysis agency (or compliance assurance agency) shall visit the factory of the producer of manufactured building to:

6.2.2.1 Compare the actual construction with the drawings and specifications.

6.2.2.2 Examine and record all features required by the codes and standards if not included in the drawings and specifications.

6.2.2.3 Evaluate all required production test methods to ascertain that the correct equipment, instruments, and procedures are followed and to determine that the building, assembly, or subassembly is capable of meeting the test requirements.

6.2.2.4 Discuss items of noncompliance with the manufacturer's representative, identify the source of the requirement, and explain the requirement.

6.2.3 The system analysis agency shall issue a written report to the manufacturer confirming all items of noncompliance from the applicable requirements and summarizing the steps needed to proceed with the system analysis.

6.2.4 The system analysis agency shall verify that all items of noncompliance are corrected by the manufacturer.

6.2.5 The system analysis agency shall prepare a final report describing the manufactured building, confirming the tests performed, stating the basis for judgment of acceptability of assemblies and components, and itemizing the edition of the codes or standards against which the building was evaluated.

6.3 *Criteria*—The system analysis agency shall be prepared to provide sample documentation to establish that its procedures accomplish the intent of the requirements of 6.2. Such documentation shall include examples of data sheets or other forms used to analyze construction and equipment, preliminary reports, final reports, and compliance assurance manuals prepared for producers of manufactured building.

## 7. System Analysis Project Manager

7.1 *Task*—To provide the services of a project manager in the system analysis function, including the following:

7.1.1 *Convening and Conducting the Preliminary Meeting*—For the purpose of familiarizing the manufacturer with the system analysis function, and with the submittal.

7.1.2 *Assisting in Preparation of a Plan for Submittal*—To establish the scope of the submission and evaluation effort.

7.1.3 *Determining the Need for Submission of Performance Data*—Assessing the extent of innovation involved in the submission in terms of identifying any part of the proposed product that is beyond the scope of ordinary systems.

7.1.4 *Staffing the System Analysis Function*—Selecting the appropriate team to undertake the system analysis, consisting of in-house staff and consultants.

7.1.5 *Monitoring Progress of System Analysis Activities*—To keep it on schedule and performing effectively.

7.2 *Requirements:*

7.2.1 *General Expertise in Building Systems*—Experience and familiarity with the state-of-the-art of new developments in building products and in the building process.

7.2.2 *Knowledge of the System Analysis Function*—Thorough understanding of the system analysis agency (of which he is a part) as well as all details of the system analysis function procedure.

7.2.3 *Knowledge of Performance Specifications*—Familiarity with performance-based evaluation of building systems.

7.2.4 *Analytical Ability*—The ability to analyze a problem and determine all the resources necessary for its solution.

7.2.5 *Practical Knowledge of Building*— An understanding of the practical aspects of the manufactured building process from several points of view (that is, owner, builder, design professional, etc.).

7.2.6 *Management Ability*—The capability of managing an interdisciplinary team of professionals, including work assignment and scheduling.

7.3 *Criteria:*

7.3.1 *Education*—Bachelor's degree in engineering or architecture, or service equivalent.

7.3.2 *Experience*—Four years of plan examination, design, construction, manufacturing building component evaluation, or manufacturing experience in the building industry. A master's degree in a related field of study may be substituted for one year of the required four years' experience. It is not a substitute for any of the types of experience listed above.

7.3.3 *Professional Competence*—Registration as a professional engineer or architect.

## 8. Technical Staff Evaluating Building Systems

8.1 *General*—8.1.1-8.1.2.6 apply to all disciplines listed in Section 8. Technical staff members may qualify for more than one discipline. The agency need not have individual technical staff members for each discipline.

8.1.1 *Task*—To assess the submission against the applicable requirements for compliance using the following:

8.1.1.1 Drawings and building specifications, including plans, elevation, sections, and details;

8.1.1.2 Engineering calculations;

8.1.1.3 Test reports, which may relate to particular subsystem or subassembly within the structure;

8.1.1.4 Materials and product specifications; and

8.1.1.5 Site and climate-related load data.

8.1.2 *Requirements:*

8.1.2.1 *Knowledge of Codes and Standards*—Knowledge of the applicable codes and standards, including geographic requirements for various load conditions.

8.1.2.2 *Knowledge of Engineering*—Understanding of conventional engineering principles and practices.

8.1.2.3 *Ability to Interpret Drawings*—Ability to read and interpret drawings for code compliance, completeness, and coordination with calculations.

8.1.2.4 *Analytical Ability*—Ability to evaluate calculations for compliance with applicable codes and standards.

8.1.2.5 *Ability to Evaluate Reports*—Ability to evaluate test reports for validity and compliance with applicable requirements.

8.1.2.6 *Knowledge of the System Analysis Process*—Understanding and appreciation of the system analysis function.

8.2 *Structural:*

8.2.1 *Task*—To assess the structural aspects of the submission against the applicable requirements for compliance.

8.2.2 *Criteria:*

8.2.2.1 *Education*—A bachelor's degree in engineering or architecture with specialized course work in structures, or service equivalent.

8.2.2.2 *Experience*—One year of structural engineering experience related to buildings.

8.3 *Mechanical:*

8.3.1 *Task*—To assess the mechanical aspects of the submission against the applicable requirements for sufficiency.

8.3.2 *Criteria:*

8.3.2.1 *Education*—A bachelor's degree in engineering or architecture with specialized course work in HVAC systems, or service equivalent.

8.3.2.2 *Experience*—One year of mechanical engineering experience related to buildings.

8.4 *Electrical:*

8.4.1 *Task*—To assess the electrical aspects of the submission against the applicable requirements for compliance.

8.4.2 *Criteria:*

8.4.2.1 *Education*—A bachelor's degree in engineering or architecture with specialized course work in electrical engineering, or service equivalent.

8.4.2.2 *Experience*—One year of electrical engineering experience related to buildings.

8.5 *Plumbing:*

8.5.1 *Task*—To assess the plumbing aspects of the submission against the applicable requirements for compliance.

8.5.2 *Criteria:*

8.5.2.1 *Education*—A bachelor's degree in engineering or architecture with specialized course work in hydraulics, or service equivalent.

8.5.2.2 *Experience*—One year of plumbing experience related to buildings.

8.6 *Building Planning:*

8.6.1 *Task*—To assess the building planning aspects of the submission against the applicable requirements for compliance.

8.6.2 *Criteria:*

8.6.2.1 *Education*—A bachelor's degree in engineering or architecture, or service equivalent.

8.6.2.2 *Experience*—One year of experience related to building planning.

8.7 *Fire Safety:*

8.7.1 *Task*—To assess the fire safety aspects of the submission against the applicable requirements for compliance.

8.7.2 *Criteria:*

8.7.2.1 *Education*—A bachelor's degree in engineering or architecture, or service equivalent.

8.7.2.2 *Experience*—One year of experience in fire protection engineering related to buildings.

## 9. Project Manager Evaluating Innovative Building Systems

9.1 *Task* (*All Disciplines*)—To assess the adequacy of the innovative design specifications to carry out the intent of the applicable requirements.

9.1.1 *Subtask 1*—To assess the applicable requirements for adequacy, using the following:

9.1.1.1 *Code Intent Statement*—An explicit statement of the intent of the applicable requirements with regard to safety and serviceability.

9.1.1.2 *Performance Specifications*—Comparison with existing performance specifications.

9.1.1.3 *Reference Materials*—Applicable reference materials such as other codes and standards, similar specifications, technical books, and journals.

9.1.1.4 *Interface with Conventional Materials*—A review of conventional materials and their environment.

9.1.2 *Subtask 2*—To assess the proposed tests for adequacy in demonstrating compliance with the proposed criteria, using the following:

9.1.2.1 Detailed test method write-ups of each proposed test.

9.1.2.2 Proposed theoretical method of calculation.

9.1.2.3 Texts on the rationale and history of simulation methods.

9.2 *Requirements:*

9.2.1 *Subtask 1:*

9.2.1.1 *Knowledge of Codes*—Knowledge of the intent of the applicable codes. Thorough understanding of the intent of the particular provisions of the applicable codes, as well as an understanding of the general concepts of health and safety requirements.

9.2.1.2 *Knowledge of Research Methods*— Access to related reference material and understanding of reference research methods.

9.2.1.3 *Advanced Concepts*—Knowledge of state-of-the-art advanced concepts in the particular discipline(s) involved. Awareness of current research relative to the material and process.

9.2.1.4 *Design Perception*—Sufficient design perception to anticipate potential areas of incompatibility and areas of potential failure relative to the structure, other systems, and the occupants.

9.2.1.5 *Building Process*—Understanding of how various constraints of sequential assembly operations influence the design selection of components and their interface connections.

9.2.2 *Subtask 2:*

9.2.2.1 *Proposals for Performance Testing*— Knowledge of testing, equipment, and methods, and evaluation of testing to performance specifications. An understanding of test methods and their applicability to different materials is essential.

9.2.2.2 *Accepted Engineering Procedures*— Knowledge of accepted engineering procedures and their applicability to

innovative materials. The appropriateness of analysis by calculations versus physical testing for these materials is a critical determination.

9.3 *Criteria:*

9.3.1 *Education*—A bachelor's degree in engineering with specialization in the particular discipline(s) involved.

9.3.2 *Experience*—Three years of building plan evaluation or building design experience with an additional one year in evaluating or designing innovative materials and systems. A master's degree may be substituted for one year of the required experience.

9.4 In addition to the above, the requirements and criteria for the technical staff evaluating innovative building systems shall be identical to those detailed in Section 8.

## 10. Technical Staff Evaluating Compliance Assurance Manuals

10.1 *Task*—To assess the following aspects of the compliance assurance manual relative to the applicable requirements for the product being produced and to assess the manufacturer's capabilities to implement and to manage the proposed processes:

10.1.1 *Integrity of Raw Material Supply*— Procedures for acceptance or rejection of incoming materials for damage and compliance with purchase documents.

10.1.2 *Integrity of Raw Materials Storage and Handling*—Availability of equipment and facilities for storage and handling of raw materials, including weatherproof space for materials susceptible to damage by weather or whose moisture content must be controlled.

10.1.3 *Assembly/Fabrication*—Appropriateness of inspection locations for monitoring fabrication or assembly sequence and availability of systems for tests and inspections.

10.1.4 *Replacement and Repair*—Ability to replace or repair unacceptable materials to limit damage of previously accepted portions.

10.1.5 *Unit Storage and Handling*—Adequacy of storage and handling of accepted units prior to shipment, including weatherproofing of units to be stored outside, the means of transporting the units from the assembly area to the storage area, and the means of rechecking the units' integrity during storage.

10.2 *Requirements:*

10.2.1 *Understanding of Materials in Proposed System*—Experience with the specific materials proposed, including understanding of their characteristics and attributes.

10.2.2 *Understanding of Production Techniques Applicable to Specific Submission*—Knowledge of construction assembly and fabrication.

10.2.3 *Ability to Read and Interpret Drawings and Other Documents*—Understanding of engineering design drawings, specifications, and other documents (inspection manual, etc.). Ability to evaluate such manuals and drawings for sufficiency.

10.2.4 *Applicability of Production Verification Inspections or Tests*—Review of proposed production verification inspections or tests for appropriateness as well as frequency, type of sampling, and test parameters.

10.2.5 *Understanding of Compliance Assurance Theory*—General appreciation and understanding of compliance assurance methods and concepts and an understanding of their application to the specific compliance assurance process proposed.

10.2.6 *Ability to Anticipate Modes of Failure*—The understanding of process design, enabling identification of likely failure locations and appropriate monitoring and inspection measures.

10.2.7 *Understanding of Process Management*—The ability to evaluate an organization's capability to perform, based on its management and administrative structure.

10.3 *Criteria:*

10.3.1 *Education*—A bachelor's degree in engineering or architecture, with course work in quality control and manufacturing processes, or service equivalent.

10.3.2 *Experience*—One year of experience in quality control or inspection relating to buildings.

## 11. Requirements and Criteria for Compliance Assurance Agencies

11.1 The compliance assurance agency is responsible for the development and implementation of a compliance assurance program with the objective of ascertaining that the manufacturer's product complies with the applicable requirements. An understanding of the elements of the manufacturer's compliance control program is essential for identifying the activities of the compliance assurance agency. It is necessary to identify them at this point as a basis for establishing an acceptable level of criteria for the compliance assurance agency.

11.2 The compliance assurance agency shall be capable of evaluating the following elements:

11.2.1 An organization identifying the person(s) responsible for the overall administration and functioning of the program.

11.2.2 A method of identifying the units produced and the inspections made on each unit.

11.2.3 The fabrication task descriptions identifying the items to be checked at the various stages of manufacture.

11.2.4 Methods for verifying that only approved materials and equipment are purchased and used.

11.2.5 A method for the control and storage of materials and equipment to be incorporated in the manufacture of each unit.

11.2.6 A method for controlling the use of approved documents.

11.2.7 Methods for making product verification measurements.

11.2.8 Procedures for corrective actions for deficient construction and materials.

11.2.9 Procedures for determining the sources of nonconformances and implementing corrective actions.

11.3 The compliance assurance agency shall demonstrate specific procedures as follows:

11.3.1 The agency shall have a definite program for training of new agency inspectors and supervision of all inspectors.

11.3.2 The agency shall arrange and conduct training programs for all inspectors to ensure uniform interpretation and application of requirements in all factories where certified products are made.

11.3.3 The agency shall maintain records to control its certification marks or State insignia when requested by the State.

11.3.4 The agency shall maintain records on performance of individual manufacturers in order to establish appropriate inspection frequency.

11.3.5 The agency shall conduct field surveys to determine that certification marks are properly applied.

11.3.6 The agency shall be capable of performing field inspections of installed products to assist regulatory authorities, when requested.

11.3.7 The agency shall establish methods for investigating field failures reported to it.

11.3.8 Where applicable, the agency shall employ a registered certification mark, and some means of maintaining record of usage.

11.4 *Criteria*—The compliance assurance agency shall provide documentation to establish that its procedures accomplish the intent of the requirements in 11.3. Such documentation shall include a formal description of its supervision and training program for inspectors, control records for its own or State insignia, or both, performance records of manufacturers, examples of field inspections, label or insignia samples, agreements or contracts with manufacturers, etc.

## 12. Compliance Assurance Agency Project Manager

12.1 *Task*—To provide the services of an agency project manager in the compliance assurance function, including the following:

12.1.1 *Project Liaison*—Representing the compliance assurance agency in project coordination meetings with other building evaluation agencies and the building system manufacturer. Familiarizing the manufacturer with the compliance assurance function and the agency staff with the new project. Submitting proposed compliance assurance manual for approval by the system analysis agency.

12.1.2 *Assisting in Preparation of the Compliance Assurance Manual*—Establishing the scope of the project and the compliance assurance effort. Reviewing technical input and preparing management portion of the proposed compliance assurance program.

12.1.3 *Scheduling of the Compliance Assurance Activities*—Preparing and monitoring the complete management plan for compliance assurance activities to keep it on schedule and performing effectively.

12.1.4 *Training*—Establishing and evaluating training programs appropriate to performance of specific job tasks of the compliance assurance inspection staff and to maintaining the technical competency of the engineering staff.

12.1.5 *Administrative Support*—Providing for effective clerical and administrative support of all agency activities.

12.2 *Requirements:*

12.2.1 *General Expertise in Systems Building*—General knowledge of the control of manufacturing processes and assurance of code compliance as related to manufactured building.

12.2.2 *General Knowledge of Applicable Requirements.*

12.2.3 *Knowledge of the Compliance Assurance Function*—Thorough understanding of the compliance assurance agency function and relationship to other building-evaluation and governmental agencies.

12.2.4 *Logical Approach to Problem Resolution and Decision Making*—Ability to define problems and organize resources to obtain a solution.

12.3 *Criteria:*

12.3.1 *Education*—A bachelor's degree in engineering, architecture, or closely related physical science, with course work in quality control and manufacturing processes.

12.3.2 *Experience:*

12.3.2.1 Two years in building code enforcement, or quality control or compliance assurance of building systems manufactured for human occupancy.

12.3.2.2 One year in responsible technical project planning and management. May be related to experience requirements in 12.3.2.1.

12.3.3 *Professional Competence*—Registration as a professional engineer or architect.

## 13. Technical Staff Preparing Compliance Assurance Manuals

13.1 *Task:*

13.1.1 In addition to the tasks specified in Section 11, the compliance assurance agency's engineering staff shall prepare at least the technical portion of the compliance assurance program. This entails the following subtasks:

13.1.1.1 *Inspection Check List*—Developing check lists for the compliance assurance agency inspectors, flagging items of particular importance.

13.1.1.2 *Label Control*—Specifying procedures to be employed in application, control, and accounting of product certification labels or marks.

13.1.1.3 *Compliance Assurance*—Preparing specific program and procedures to be followed by compliance assurance agency inspectors regarding frequency and format of plant visits, preparation and interpretation of sampling frequency plans, and resolution of various categories of discrepancies.

13.1.2 To provide the technical expertise necessary to resolve compliance assurance problems referred by the agency's inspection staff and assist the manager in identifying those problems which should be referred to the system analysis agency due to the involvement of design or process changes.

13.2 The basic requirements and criteria for compliance assurance agency technical staff and consultants preparing compliance assurance manuals are the same as those for the system analysis agency staff responsible for approving the manuals (see Section 10). Engineering personnel qualified under this standard may be either on the agency staff or under contract to provide the specified technical services.

13.3 *Requirements*—See Section 10.

13.4 *Criteria:*

13.4.1 *Education*—A bachelor's degree in engineering or architecture, or service equivalent.

13.4.2 *Experience:*

13.4.2.1 One year of experience in factory quality control and manufacturing processes.

13.4.2.2 (*a*) One year in building code enforcement, or in compliance control or compliance assurance of building systems manufactured for human occupancy; or (*b*) one year of experience, and understanding of inspection, or testing and test methods, or both, relative to building systems manufactured for human occupancy.

NOTE 1—Qualifying experience shall relate to the types of building codes and standards and the construction materials and processes for which the engineer is to provide technical services.

## 14. Compliance Assurance Supervisor of Inspection

14.1 *Task:*

14.1.1 *Monitoring of Field Inspection*—To provide periodic first-hand review of the performance of compliance assurance agency inspectors in the field.

14.1.2 *Resolution of Problems*—To resolve non-routine inspection referred by field inspectors. Refer the technical problems to the technical staff.

14.2 *Requirements:*

14.2.1 *Detailed Knowledge of the Applicable Requirements.*

14.2.2 *Supervisory Ability*—Ability to select and motivate inspectors who perform as required, and to provide a proper balance between efficient utilization of personnel and assurance of compliance.

14.2.3 *Personnel Evaluation*—Ability to perform periodic unscheduled in-plant inspections using the approved compliance assurance manual for the purpose of providing an ongoing evaluation of the performance of the compliance assurance inspectors and the adequacy of the program.

14.3 *Criteria:*

14.3.1 *Education*—Mathematical and communicative skills equivalent to those acquired through a high school education.

14.3.2 *Experience*—Three years as an inspector in manufactured building or related quality control, or building experience.

## 15. Compliance Assurance Inspectors

15.1 *Task:*

15.1.1 To perform the in-plant monitoring of the manufacturer's compliance control program using the inspection checklist developed by the technical staff.

15.1.2 To perform production inspections or tests for the purpose of monitoring the effectiveness of the compliance assurance program, or witness such tests performed by others.

15.2 *Requirements:*

15.2.1 *Personal Characteristics*—Possession of the personal characteristics of tact, integrity, and a sense of authority.

15.2.2 *Technical Characteristics*—Ability to follow detailed instructions and checklists that provide the criteria for construction, including both material and fabrication requirements.

15.2.3 *Orientation and Training*—Completion of a period of orientation and training for which he performs the inspection function. This training shall be under the continuous direction of a supervisor fully qualified under this criteria.

15.2.4 *Production Inspections or Tests*—Ability to evaluate the results of well-defined or routine measurements or tests by reason of experience or familiarity with such measurements or tests.

15.3 *Criteria:*

15.3.1 *Education*—Mathematical and communicative skills equivalent to those acquired through a high school education.

15.3.2 *Experience*—Two years in building construction, building code enforcement, or quality control inspection.

## 16. Keywords

16.1 building codes; building evaluation agencies; compliance assurance agency; manufactured building; system analysis

## SUMMARY OF CHANGES

Committee E36 has identified the location of selected changes to this standard since the last issue (E541 – 08) that may impact the use of this standard. (Approved May 1, 2010.)

*(1)* Revised 3.1.7.