



Standard Criteria for Agencies Engaged in System Analysis and Compliance Assurance for Manufactured Building¹

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INTRODUCTION

This standard 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 standard'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.

To establish an appropriate degree of intra- and inter-state 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.

Building-evaluation organizations examined under this standard 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. Scope

1.1 This standard covers criteria by which the technical resources of agencies, both governmental and private, may be evaluated for their capability to perform the system analysis (Part A) or compliance assurance (Part B) function, or combination thereof, in the evaluation and inspection (certification) of manufactured building.

1.2 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.

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

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

bility of regulatory limitations prior to use.

2. Descriptions of Terms Specific to This Standard

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

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

2.3 *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.

2.4 *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.

2.5 *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.

2.6 *compliance assurance*—the process of appraising the manufacturer's compliance control program in conjunction with monitoring or auditing and inspection of production,

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implemented to provide objective evidence that the manufactured building conforms to the approved documents.

NOTE 1—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.

2.7 compliance assurance manual—a document employed by the compliance assurance agency for the purpose of periodic monitoring, surveillance, or audit of the manufacturer's production and product compliance programs.

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

2.9 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.

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

2.11 manufactured building—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.

2.12 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.

2.13 service equivalent—the experience that an individual has accumulated in the engineering or architectural discipline(s) involved that serves as a substitute for academic requirements. In general, 8 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.

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

NOTE 2—In conventional construction the system analysis function roughly corresponds to plan review and approval by the authority having jurisdiction.

PART A—REQUIREMENTS AND CRITERIA FOR SYSTEM ANALYSIS AGENCIES

3. General

3.1 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:

- 3.1.1 Project management.
- 3.1.2 Preliminary meeting.
- 3.1.3 Submission of documents.

- 3.1.4 Staffing.
- 3.1.5 Evaluation of prescribed systems.
- 3.1.6 Evaluation of performance specifications.
- 3.1.7 Evaluation of innovative systems.
- 3.1.8 Evaluation of compliance assurance manuals.
- 3.1.9 Evaluation of installation documents.
- 3.1.10 Factory visit (this may be included in compliance assurance function).

4. Documents of the System Analysis Function

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

- 4.1.1 Product description document.
- 4.1.2 Compliance assurance manual.
- 4.1.3 Installation document.

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

4.3 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.

5. General Procedure for System Analysis

5.1 Task—To provide a description of the general procedures for system analysis, which includes as a minimum the activities described in 5.2.

5.2 Requirements:

5.2.1 Drawings, calculations, 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.

5.2.2 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:

5.2.2.1 Compare the actual construction with the drawings and specifications.

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

5.2.2.3 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.

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

5.2.3 The system analysis agency shall issue a written report to the manufacturer confirming all items of compliance and noncompliance.

from the applicable requirements and summarizing the steps needed to proceed with the system analysis.

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

5.2.5 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.

5.3 *Criteria*—The system analysis agency shall be prepared to provide sample documentation to establish that its procedures accomplish the intent of the requirements of 5.2. 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.

6. System Analysis Project Manager

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

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

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

6.1.3 *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.

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

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

6.2 Requirements:

6.2.1 *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.

6.2.2 *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.

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

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

6.2.5 *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.).

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

6.3 Criteria:

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

6.3.2 *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.

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

7. Technical Staff Evaluating Building Systems

7.1 *General*—Paragraphs 7.1.1-7.1.2.6. to apply to all disciplines listed in Section 7. Technical staff members may qualify for more than one discipline. The agency need not have individual technical staff members for each discipline.

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

7.1.1.1 Drawings and building specifications, including plans, elevation, sections, and details.

7.1.1.2 Engineering calculations.

7.1.1.3 Test reports, which may relate to particular subsystem or subassembly within the structure.

7.1.1.4 Materials and product specifications.

7.1.1.5 Site and climate-related load data.

7.1.2 Requirements:

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

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

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

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

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

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

7.2 . Structural:

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

7.2.2 Criteria:

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

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

7.3 Mechanical:

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

7.3.2 Criteria:

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

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

7.4 Electrical:

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