Designation: E651/E651M – 22

An American National Standard

Standard Practice for Evaluating Capabilities of Agencies Involved in System Analysis and Compliance Assurance for Manufactured Building[1]

This standard is issued under the fixed designation E651/E651M; 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 practice is intended as a companion standard to Specification E541, Specification for Agencies Engaged in System Analysis and Compliance Assurance for Manufactured Building. Specification E541 covers criteria by which the technical resources of agencies may be evaluated for their capability to perform the system analysis or compliance assurance function, or both, in the evaluation and inspection of manufactured building. This standard [2] includes questions that should be asked of system analysis and compliance assurance agencies in order for the administrative agency to evaluate their competency. Personnel matters are not highlighted in this standard since they are covered in detail in Specification E541. This is not meant to imply that they are not important.

1.2 The preferred method for utilizing this practice is for qualified personnel of the administrative agency to visit the system analysis and compliance assurance agencies' headquarters to speak to qualified personnel and examine pertinent records and documentation. Alternatively, the evaluation may be done at any location provided the agency being evaluated is fully informed as to the material and personnel they will need to have on hand for the evaluation.

1.3 Some of the following will not be applicable in the evaluation of an agency that has not had prior experience as a building-evaluation organization. It is not the intent of this practice to preclude acceptance of such an agency provided it can otherwise demonstrate that its organizational procedures and experience in other product categories and experience of key personnel reflect a keen awareness of the problems and processes involved in manufactured building evaluation and thus warrant acceptance. In such instances the administrative agency may wish to consider extending provisional acceptance over a definite period of time, during which it is expected that the agency will have opportunity to gain the requisite experience and demonstrate its capabilities and compliance assurance functions for manufactured building.

1.4 Failure of an agency to respond satisfactorily to one or more criteria in the following should not be sole cause for rejection. Such failure should be brought to the agency's attention and be subject to close scrutiny during subsequent reevaluations.

1.5 This practice is intended to achieve uniformity in the regulation of manufactured building. It may be necessary to make changes and modifications in order to adapt to legislative or other regulatory requirements of some jurisdictions.

1.6 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the 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:*[3]

E541 Specification for Agencies Engaged in System Analysis and Compliance Assurance for Manufactured Building

3. System Analysis

"6.2.1 Drawings, calculations, and specifications of manufactured building shall be reviewed by agency's engineering

[1] This practice 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 1, 2022. Published August 2022. Originally approved in 1978. Last previous edition approved in 2008 as E651/E651M – 01 (2008), which was withdrawn in January 2017 and reinstated in June 2022. DOI: 10.1520/E0651_E0651M-22.

[2] In preparation of this practice, much assistance was gained by referring to Building Science Series 87, "Model Documents for the Evaluation, Approval, and Inspection of Manufactured Buildings," prepared by the Center for Building Technology, Institute for Applied Technology, National Bureau of Standards, issued July 1976.

[3] 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.

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." [4]

3.1 *Questions:*[5]

3.1.1 Does the system analysis agency have on hand copies of the standard(s), codes(s), specification(s), etc., against which the product is being evaluated?

3.1.2 Does the system analysis agency have on hand "how to" manuals such as UPC Plumbing Code Interpretations Manual, NFPA Handbook of the National Electrical Code, etc., and similar manuals which provide the agency with useful background information? Does the agency maintain copies of current product directories, lists, certification directories, etc., published or issued by independent organizations, trade associations, and other groups?

3.1.3 Ask to see checklists and other evaluation aids developed by the system analysis agency, or developed by others and used by the agency, in their evaluation process. Does the agency have: (*a*) a data collection checklist for determining the adequacy of data submitted by the manufacturer for review (that is, how does the agency know when it has sufficient data to start a review?); (*b*) a comprehensive review checklist for determining compliance with applicable standards and procedures that cover the full range of architectural, structural, mechanical, etc., features to be reviewed? Does the review checklist include provisions for convenient notation of those items found to be and not to be in compliance with the code(s)?

3.1.4 Ask the system analysis agency to explain the criteria upon which they base their acceptance or rejection of a component, material, device, etc., used in the building system.

3.1.4.1 Is the product specifically identified as to make, model, type designation, etc.?

3.1.4.2 Is the code or standard that forms the technical basis for certification of a product known, such as by being marked on the product, or included in the certifier's seal, label, or mark, or referenced in the certifier's test report or other available documents?

3.1.5 Ask the system analysis agency to explain the criteria upon which they base their acceptance or rejection of tests on individual products used in the building system. Does the criteria include at least the following elements:

3.1.5.1 Identification of the specimen tested (manufacturer, type, model number, source of supply, etc.).

3.1.5.2 A detailed description or drawing of the physical characteristics of the specimen, including condition (age, repair, etc.).

3.1.5.3 Number of tests and sampling technique used in selection of specimens.

3.1.5.4 Identification of test method used (if a standard test method) or a detailed description of the test procedure, equipment, and instrumentation used.

3.1.5.5 Tabulation of numerical values associated with test, such as loadings, voltage, etc., and corresponding result readings (for example, deflections), giving the time scale involved.

3.1.5.6 Listing or identification of any significant test conditions not indicated above (such as ambient air temperature, humidity, etc.).

3.1.5.7 Date of test.

3.1.5.8 Name and address of testing organization or laboratory.

3.1.5.9 Signature of the laboratory's officer or authorized representative (generally a test engineer in charge who is a professional engineer), and date of signature.

3.1.6 Does product bear the seal, label, or mark of product certifying agency or organization? If "no" for some or all products, ask agency to explain basis of acceptance. If "yes":

3.1.6.1 Is seal, label, or mark of product certifying agency registered?

3.1.6.2 Does the product certifying agency have strict procedures for controlling the use of its seal, label, or mark?

3.1.6.3 Does product certifying agency or organization conduct routine factory audit of products bearing its seal, label or mark?

"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 tests 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."

3.2 *Questions:*[5]

3.2.1 Confirm that building evaluation agency (system analysis agency or compliance assurance agency) arranges for its personnel to visit a manufacturer's factory after review of drawings and specifications to perform the steps enumerated in the evaluation process outlined in *6.2.2.1* through *6.2.2.4* above.

3.2.2 Ask to see representative reports prepared by the building evaluation agency subsequent to such factory visits as evidence of documenting the replies to the following, as appropriate:

3.2.2.1 Does the agency examine manufactured buildings in various phases of construction to ascertain that they are being constructed in accordance with the drawings and specifications submitted by the manufacturer?

3.2.2.2 Does the agency examine the manufactured buildings for the purpose of disclosing and recording features of

[4] Criteria in italics are extracted without change from ASTM Standard E541, Specification for Agencies Engaged in System Analysis and Compliance Assurance for Manufactured Building.

[5] Questions to be asked of the building evaluation agencies (system analysis agency or compliance assurance agency) by the administrative agency.

construction, workmanship, etc., not shown in the drawings or specifications that may be at variance with the codes and standards?

3.2.2.3 Does the agency have a written procedure or checklist for review of manufacturers' test methods and frequency?

3.2.2.4 Does the agency procedure or report contain adequate documentation of the applicable standards that are to be used in each manufacturer's test?

3.2.2.5 Are all manufacturers' test methods reviewed by qualified agency technical staff?

3.2.2.6 Does the agency require the manufacturer to maintain a record of all tests?

3.2.2.7 Does the agency require the manufacturer to maintain a record documenting periodic calibration of inplant test equipment?

3.2.2.8 Does the agency discuss with the manufacturer's representative how the material or component used, the assembly or installation procedure followed, or the workmanship accepted can or does result in a failure to conform to the code(s), standard(s), or specification(s)?

3.2.2.9 Does the agency determine through discussion with the manufacturer's representative how the failure to conform will be corrected on the deficient unit or units and avoided in subsequent production?

3.2.2.10 Does the agency require that the nature of the deficiency *and* the corrective action taken be so documented that the compliance assurance agency can readily anticipate and detect future deficiencies of like nature?

"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."

3.3 *Questions:*[5]

3.3.1 Ask the system analysis agency to provide examples of written reports they have prepared on manufactured buildings. Do the reports:

3.3.1.1 Clearly state the features found to be in noncompliance, with reference to the specific source of the requirement?

3.3.1.2 Summarize the steps needed to proceed with the system analysis (that is, provide corrected drawings and specifications, additional test reports, revised compliance assurance manual, etc.)?

3.3.1.3 Include the date and place of the factory visit, if conducted, list the agency and manufacturer's personnel involved, and delineate between the features found to be in noncompliance as a result of the review of drawings and specifications versus those found to be in noncompliance as a result of the factory visit?

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

3.4 *Questions:*[5]

3.4.1 Ask the system analysis agency to explain the procedures they employ to verify that all items of noncompliance are corrected by the manufacturer.

3.4.2 Does the system analysis agency include provision for a second factory visit to verify that corrections have been made by the manufacturer when (*1*) items of noncompliance are numerous, or (*2*) may relate to workmanship, or (*3*) corrections are comparatively complicated and corrections cannot be readily verified by review of corrected drawings or specifications?

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

3.5 *Questions:*[5]

3.5.1 Ask the system analysis agency to provide copies of reports it has prepared that cover manufactured buildings the agency has evaluated.

3.5.2 Is the report signed and dated by responsible system analysis agency personnel?

3.5.3 Does the report contain a clear statement of the applicable standards to which the evaluation has been made and the approval is issued?

3.5.4 Does the report accurately and clearly state the various zones for which the units are approved (that is, wind, snow, heating, etc.)?

3.5.5 Does the report contain a complete index?

3.5.6 Does the report clearly identify the manufacturer and which manufacturing facility locations are covered by the report?

3.5.7 Does the report contain system analysis agency procedures for coordinated continuing revision and updating of the document?

3.5.8 Does the report contain appropriate manufacturer certification statements, labeling and data plate instructions?

3.5.9 Does the report contain the manufacturer's authorization for the agency to conduct inspection, if applicable?

3.5.10 Does the report contain the manufacturer's serial numbering system?

3.5.11 Does the report contain adequate detail to show compliance with planning consideration requirements?

3.5.12 Does the report contain adequate list of typical appliances, equipment, fixtures, and structural materials to be used?

3.5.13 Does the report contain specifications or samples of all required instruction labels?

3.5.14 Does the report contain a complete list of approved models, options, and option combinations?

3.5.15 Does the report contain floor plans of each approved model?

3.5.16 Does the report adequately document options and combinations of options by floor plan?

3.5.17 Does the report contain adequate detail to show compliance with fire safety requirements?

3.5.18 Does the report adequately document all structural systems (that is, general structural criteria, floors, walls, roof/ceiling, headers, ridge beams, etc.)?

3.5.19 Does the report adequately document the structural effect of options and option combinations?

3.5.20 Does the report contain adequate criteria for structural materials, alternatives, fastening schedules, etc.?

3.5.21 Does the report fully document structural test criteria, required certification labels, lumber and plywood grade markings, etc?

3.5.22 Does the report fully document all thermal protection aspects including infiltration control, condensation control, thermal transmission values, heat loss/gain calculations, etc?

3.5.23 Does the report contain necessary heat loss/gain certification information as required for each model and option combination?

3.5.24 Does the report document plumbing supply and DWV systems for each approved model and option combination?

3.5.25 Does the report contain typical information covering general plumbing system requirements such as dishwasher hookups, method of maintaining drainage slope, etc.?

3.5.26 Does the report document heating/AC duct air handling capabilities?

3.5.27 Does the report document gas piping systems and register layouts for each approved floor plan and option combination?

3.5.28 Does the report contain adequate details of heat-producing system installation such as shutoff valve locations, clothes dryer duct installation, register installation, fireplace installation, etc.?

3.5.29 Does the report contain adequate documentation to show compliance with electrical requirements (that is, determination of feeder size, sizing and mounting of device boxes, interconnection of units, grounding and bonding details, etc.)?

3.5.30 Does the report contain complete electrical schematic and circuit load schedule for each floor plan and option or combination of option?

3.5.31 Does the report contain adequate documentation of any applicable transportation or delivery systems?

3.5.32 Does the report contain a complete copy of the manufacturer's approved compliance control manual?

3.5.33 Does the report contain a complete copy of the manufacturer's approved installation instructions?

3.5.34 Does the report contain a complete indexed set of structural calculations, test reports, and other applicable certification documentation?

4. Compliance Assurance

"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."

4.1 *Questions:*

4.1.1 Ask to see a copy of a typical manufacturer's compliance control manual that has been evaluated and approved by the compliance assurance agency. Does the manual:

4.1.1.1 Identify who is responsible for implementing the manufacturer's approved compliance control program? If there is more than one person responsible, how do their duties dovetail, or is there overlap?

4.1.1.2 List the qualifications of the responsible individual?

4.1.1.3 Identify the supervisor of the responsible individual and his/her position with the manufacturer?

4.1.1.4 Show the input of the responsible individual in the overall policies of the manufacturer, if any?

4.1.1.5 Identify applicable codes and standards documents which are readily available to responsible personnel?

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

4.2 *Questions:*

4.2.1 Does the compliance assurance agency review the manufacturer's compliance control manual to:

4.2.1.1 Evaluate the method of serializing each unit of production?

4.2.1.2 Evaluate the method of making inspections of each unit?

4.2.1.3 Evaluate the method of maintaining records of these inspections?

4.2.2 How does the compliance assurance agency ascertain that inspections are conducted as required?

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

4.3 *Questions:*

4.3.1 Does the compliance assurance agency assure that a product inspection checklist is prepared by the manufacturer to assure product compliance?

4.3.2 Does the inspection checklist include:

4.3.2.1 A format that orients its use to the production flow in the factory?

4.3.2.2 Specific references to requirements for materials, lumber grades, fasteners, etc.?

4.3.2.3 Adequate spaces for signatures (or initials) of responsible inspection personnel?

4.3.2.4 Adequate details of required test procedures?

4.3.2.5 Adequate space for explanation of defects?

4.3.2.6 Adequate details of the product(s) being produced to assure continued compliance with approved specifications?

4.3.2.7 Specific information that spells out the method for determining compliance (that is, "bundle marked," "visual,"" measured," "labeled," etc.)?

4.3.2.8 Adequate correlation with the product description documents (that is, that the species and grade shown on the checklist are the same as contained in the design approval documents)?

4.3.2.9 Defined "hold" points beyond which units cannot pass until inspection is completed and approved to continue?

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

4.4 *Questions:*