CHAPTER 17

STRUCTURAL TESTS AND INSPECTIONS

(A substantial portion of this Chapter is unique to Massachusetts)

780 CMR 1701.0 GENERAL

1701.1 Scope: The provisions of 780 CMR 17 shall govern the quality, workmanship and requirements for all materials hereafter used in the construction of buildings and structures. All materials of construction and tests shall conform to the applicable standards listed in 780 CMR.

1701.2 New materials: All new building materials, equipment, appliances, systems or methods of construction not provided for in 780 CMR, and any material of questioned suitability proposed for use in the construction of a building or structure, shall be subjected to the tests prescribed in 780 CMR 17 and in the *approved rules* to determine character, quality and limitations of use.

In accordance with 780 CMR 109.3.4, the building official may require that such materials be presented before the Construction Materials Safety Board for approval.

1701.3 Used materials: The use of all second-hand materials which meet the minimum requirements of this code for new materials shall be permitted.

780 CMR 1702.0 DEFINITIONS

1702.1 General: The following words and terms shall, for the purposes of 780 CMR 1702.0 and as used elsewhere in 780 CMR, have the meanings shown herein.

Approved agency: An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved (see 780 CMR 1704.0).

Fabricated item: Structural, loadbearing or lateral *load*-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by 780 CMR, such as rolled structural steel shapes, steel-reinforcing bars, masonry units and plywood sheets, shall not be considered “fabricated items.”

Inspection, *structural*: inspection as herein required of the installation, fabrication, erection or placement of components and connections requiring special expertise to ensure adequacy (see 780 CMR 116.0 and 1705.0).

Label: A plate, tag or other device which is permanently and prominently affixed to a product or material indicating that it has been tested and evaluated by an *approved agency* (see 780 CMR 1704.3).

Structural Engineer of Record (SER): The ***registered professional engineer*** whose professional seal of registration and signature appears on the design documents submitted with the building permit application, or the alternate ***(SER)*** who succeeds the ***(SER)***, as provided in 780 CMR 1705.3.3.

780 CMR 1703.0 INFORMATION REQUIRED

1703.1 Material performance: Where the quality of materials is essential for conformance to 780 CMR, specific information shall be given to establish such quality; and 780 CMR shall not be cited, or the term "legal" or the term's equivalent be used as a substitute for specific information. This information shall consist of test reports conducted by an *approved testing agency* in accordance with the standards referenced in ***Appendix A*** or such other information as necessary for the code official to determine that the material meets the applicable code requirements.

1703.1.1 Labeling: Where materials or assemblies are required by 780 CMR to be *labeled*, such materials and assemblies shall be labeled by an *approved agency* in accordance with 780 CMR 1704.0.

1703.2 Research and investigation: Sufficient technical data shall be submitted to substantiate the proposed use of any material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the code official shall approve the use of the maternal or assembly subject to the requirements of 780 CMR. The cost of all tests, reports and investigations required under 780 CMR 17 shall be paid by the permit applicant.

1703.2.1 Research reports: Supporting data, where necessary to assist in the approval of all materials or assemblies not specifically provided

for in 780 CMR, shall consist of valid research reports from approved sources.

1703.3 Evaluation and follow-up inspection services: Prior to the approval of a closed prefabricated assembly, the permit applicant shall submit an evaluation report of each prefabricated assembly. The report shall indicate the complete details of the assembly, including a description of the assembly and the assembly's components, the basis upon which the assembly is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to 780 CMR.

1703.3.1 Evaluation service: The code official shall review evaluation reports from approved sources for adequacy and conformance to 780 CMR.

1703.3.2 Follow-up inspection: The owner shall provide for *structural inspections* of *fabricated items* in accordance with 780 CMR 1705.

1703.3.3 Test and inspection records: Copies of all necessary test and inspection records shall be filed with the code official.

780 CMR 1704.0 APPROVALS

1704.1 Written approvals: Where approvals by the *building official* are required by the provisions of 780 CMR, such approvals shall be given in *writing* within a reasonable time after satisfactory completion of all the required tests and submissions of required test reports.

1704.2 Approved record: For any material, appliance, equipment, system or method of construction that has been approved, a record of such approval, including all of the conditions and limitations of the approval, shall be kept on file in the *building official's* office and shall be open to public inspection at all appropriate times.

1704.3 Labeling: Products and materials required to be *labeled* shall be *labeled* in accordance with the procedures set forth in 780 CMR 1704.3.1 through 1704.3.3.

1704.3.1 Testing: An *approved agency* shall test a representative sample of the product or material being *labeled* to the relevant standard or standards. The *approved agency* shall maintain a record of all of the tests performed. The record shall provide sufficient detail to verify compliance with the test standard.

1704.3.2 Inspection and identification: The *approved agency* shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be *labeled*. The inspection shall verify that the *labeled* product or material is representative of the product or material tested.

1704.3.2.1 Independent: The *agency* to be approved shall be objective and competent. The *agency* shall also disclose all possible conflicts of interest so that objectivity can be confirmed.

1704.3.2.2 Equipment: An *approved agency* shall have adequate equipment to perform all required tests. The equipment shall be periodically calibrated.

1704.3.2.3 Personnel: An *approved agency* shall employ experienced personnel educated in conducting, supervising and evaluating tests.

1704.3.3 Label information: The label shall contain the manufacturer's or distributor's identification, model number, serial number, or definitive information describing the product or material's performance characteristics and *approved agency*'s identification.

1704.4 Heretofore-approved materials: The use of any material already *fabricated* or of any construction already erected, which conformed to requirements or approvals heretofore in effect, shall be permitted to continue, if not detrimental to life. health or safety of the public.

780 CMR 1705.0 *REQUIREMENTS FOR STRUCTURAL TESTS AND INSPECTIONS*

1705.1 General: The permit applicant shall provide *special inspections* where application is made for construction as described in 780 CMR 1705.0.

Exceptions:
1. Structural tests and inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by M.G.L. c 112 § 60K and/or M.G.L. c 112 § 81D.
2. *Structural tests and inspections* are not required for occupancies in Use Group R-3.

1705.2 ***Purpose: The purpose of the structural tests and inspections specified in 780 CMR 1705 is to provide assurance to the owner and the building official that the construction complies with the requirements of the structural design by the SER. These tests and inspections are for quality asurance audits and their implementation does not relieve the contractor or sub-contractors of their responsibility for quality control of the work and any design for which they are responsible.***

1705.3 ***Program for tests and inspections: The SER shall establish a program of structural tests and inspections which meets the requiremnts of 780 CMR 17. The SER shall direct the implementation of this program and select any structural inspectors required to undertake the program. All fees and costs related to the implementation of this program shall be borne by the owner***.

1705.3.1 Building permit requirement: ***The permit applicant shall submit the program of structural tests and inspections prepared by the SER as a condition for permit issuance. This program shall include a complete list of materials and work requiring structural tests and inspections by 780 CMR 1705.1, the inspections to be performed and a list of the individuals, approved agencies and firms intended to be retained for conducting such inspections.***

1705.3.2 Report requirement: ***A final report stating that the program of structural tests and inspections has been satisfactorily completed shall be submitted to the owner and the building official by the SER prior to the issuance of the certificate of occupancy. As construction progresses, inspection reports and records of tests and measurements shall be maintained by the SER. When these records are requested by the building official, they shall be submitted promptly, in accordance with procedures established by the building official prior to the start of construction. When deviations from design requirements are determined during tests or inspections, the SER shall promptly report such to the contractor for correction. If the contractor fails to correct any reported deviation, it shall be reported to the building official by the SER.***

1705.3.3 Alternate SER*: If the SER cannot continue with the project, the owner shall retain an alternate qualified registered professional engineer to review the design and assume the full responsibilities of the former SER.*

1705.3.4 Performance specifiactions*: The SER shall identify, in the program of structural tests and inspections submitted with the building permit application, any structural elements or systems that the SER has specified to be designed by another registered professional engineer. The SER shall review the design of these structural elements or systems and shall include them in the program of structural tests and inspections.*

1705.3.5 ***Waiver of structural inspection by the SER: Where, in then opinion of the SER, any portion of the contractor's quality control program meets the inspection and test requirements of 780 CMR 1705, the SER may reduce the specifed quality assurance structural inspection and test program following approval by the building official. When this is done the final inspection report shall also include reference to the results of those inspections performed by the contractor. As construction progresses, reports of inspections and measurements shall be submitted to the SER and, if requested, to the building official.***

1705.4 Inspection of fabricators: Where fabrication of structural loadbearing members and assemblies is being performed on the premises of a fabricator's shop, *structural inspection* of the *fabricated items* shall be required. The *fabricated items* shall be *inspected* as required by 780 CMR 1705.0 and as required elsewhere in 780 CMR.

1705.4.1 Fabrication procedures: The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures which provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved drawings, project specifications and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

1705.4.2 Procedures implementation: The structural inspector shall verify that the fabricator is properly implementing the fabrication and quality control procedures outlined in 780 CMR 1705.4.1.

Exception: ***Structural inspections as required by 780 CMR 1705.4 may be reduced by the SER where the fabricator maintains an agreement with an approved independent inspection or quality control agency to conduct periodic in-plant inspections at the fabricator's plant, at a frequency that will assure the fabricator's conformance to the requirements of the inspection agency's approved quality control program.***

1705.5 Steel construction: The *structural inspections* for steel elements of buildings and structures shall be as required by 780 CMR 1705.5.1 through 1705.5.3.

1705.5.1 Inspection of steel fabricators: The permit applicant shall provide *structral inspection* of steel *fabricated items* in accordance with the provisions of 780 CMR 1705.2.

Exception: *Structural inspection* of the steel fabrication process shall not be required where

the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control which demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements and bolts are capable of being determined.

1705.5.2 Material receiving: All main stress-carrying elements, welding material and bolting material shall be *inspected* for conformance to Table 1705.5.2.

Table 1705.5.2
INSPECTION FOR STEEL MATERIALS

Material	Inspection requuired	Reference[a] for criteria
Bolts, nuts, washers	1. Material identification markings 2. Conformance to ASTM standards specified by the design engineer Manufacturer's certificate of compliance is required	Applicable ASTM material specifications; AISC ASD, Section A3.4; AISC LRFD, Section A3.3
Structural steel	1. Material identification markings 2. Conformance to ASTM standards specified in the approved plans and specifications	ASTM A6 or ASTM A568 Provide certified test reports in accord-ance with ASTM A6 or ASTM A568
Weld filter materials	1. Conformance to AWS specifications as specified in the approved plans and specifications. Manufacturer's certificate of compliance is required	AISC ASD, Section A3.6; AISC LRFD, Section A3.5

Note a. The specific standards referenced are those listed in *Appendix A.*

1705.5.3 Erection: *Structural inspections* are required for bolts, welding and details as specified in 780 CMR 1705.5.3.1 through 1705.5.3.3.

1705.5.3.1 Installation of high-strength bolts: Inspection shall be as specified in Section 9 of the RCSC Specification for Structural Joints Using A325 or A490 Bolts listed in ***Appendix A***.

1705.5.3.2 Welding: Weld inspection shall be in compliance with Section 6 of AWS D1.1 listed in ***Appendix A***. Weld inspectors shall be certified in accordance with AWS D1.1 listed in ***Appendix A***.

1705.5.3.2.1 Welding of the structural seismic-resisting system: Welding of the structural seismic-resisting system of buildings, shall be *inspected* in accordance with 780 CMR 1705.5.3.2.2 and 1705.5.3.2.3. Each complete penetration groove weld in joints and splices shall be tested for the full length of the weld either by ultrasonic testing or by other approved methods, for special moment frames and eccentrically braced frames.

Exception: The nondestructive testing rate for welds made by an individual welder is permitted to be reduced to 25% of the welds, with the approval of the **SER**, provided the weld inspection reject rate is 5% or less.

1705.5.3.2.2 Column splice welds: Column splice welds, which are partial penetration groove welds, shall be tested by ultrasonic testing or other approved methods at a percentage rate established by ***SER***. All partial penetration column splice welds designed for axial or flexural tension from seismic forces shall be tested.

1705.5.3.2.3 Base metal testing: Base metal having a thickness more than 1.5 inches (38 mm) and subject to through-thickness weld shrinkage strains shall be ultrasonically tested for discontinuities behind and adjacent to the welds after joint welding. Any material discontinuities shall be evaluated based on the criteria established in the *construction documents* by the ***SER***.

1705.5.3.3 Details: The structural inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the approved *construction documents*, such as bracing, stiffening, member locations and proper application of joint details at each connection.

1705.6 Concrete construction: The *structural inspections* for concrete structures and concreting operations shall be as required by 780 CMR 1705.6.1 through 1705.6.6.

Exception: *Structural inspections* shall not be required for:

1. Concrete footings of buildings three stories or less in height which are fully supported on earth or rock.
2. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (0.11 kg/mm^2).

3. Plain concrete foundation walls constructed in accordance with Table 1812.3.2.
4. Concrete patios, driveways and sidewalks, on grade.

1705.6.1 Materials: In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318 listed in ***Appendix A*** the code official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318 listed in ***Appendix A***. Weldability of reinforcement that conforms to ASTM A706 listed in ***Appendix A*** shall be determined in **1705.6.3 Concreting operations**: During placing and curing of concrete, the *special inspections* listed in Table 1705.6.3 shall be performed.

Table 1705.6.3
REQUIRED INSPECTIONS DURING CONCRETING OPERATIONS

Required inspection	Reference[a] for criteria
1. Evaluation of concrete strength, except as exempted by 780 CMR1908.3.1(3).	ACI 318 Section 5.6
2. Inspection for use of proper mix proportions and proper mix techniques.	ACI 318 Chapter 4, Sections 5.2, 5.3, 5.4 and 5.8
3. Inspection during concrete placement, for proper application techniques.	ACI 318 Sections 5.9 and 5.10
4. Inspection for maintenance of specified curing temperatures and techniques.	ACI 318 Sections 5.11, 5.12 and 5.13

Note a. ACI 318 listed in ***Appendix A***

1705.6.4 Inspection during prestressing: Inspection during the application of prestressing forces shall be performed to determine compliance with Section 18.18 of ACI 318 listed in ***Appendix A***.

1705.6.4.1 Inspection during grouting: Inspection during the grouting of bonded prestressing tendons in the structural seismic-resisting system shall be performed.

1705.6.5 Manufacture of precast concrete: The manufacture of precast concrete, as required by 780 CMR 1705.4, shall be subject to a quality control program administered by an *approved agency*.

1705.6.6 Erection of precast concrete: Erection of precast concrete shall be *inspected* for compliance with the approved plans and erection drawings.

accordance with the requirements of 780 CMR 1906.5.2.

1705.6.2 Installation of reinforcing and prestressing steel: The location and installation details of reinforcing and prestressing steel shall be *inspected* for compliance with the approved *construction documents* and ACI 318 (such as Sections 7.4, 7.5, 7.6 and 7.7) listed in ***Appendix A***. Welding of reinforcing of the structural seismic-resisting system shall be *inspected*.

1705.7 Masonry construction: The *structural inspections* listed in Table 1705.7 shall be required for masonry construction.

Table 1705.7
SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION

Inspection or test	Referenced[a] criteria	
	ACI 530/ ASCE5/ TMS 402	ACI 530.1 ASCE 6/ TMS 602
1. Material		Sec.2.2
2. Masonry strength		Sec. 1.6
3. Construction operations:		
a. Proportioning, miximg consistency of mortar and grout		Sec. 2.3.2.5 Sec 4.2.2
b. Application of mortar grout and masonry units		Sec. 2.3.3.3 Sec. 4.3.3
c. Condition, size, location and spacing of reinforcement	Chapter 8	
d. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 100°F)		Sec. 2.3.2.2 Sec. 2.3.2.3
e. Anchorage	Sec. 4.2 Sec. 5.14	
4. Inspection of welding of reinforcement, grouting, consolidation and reconsolidation for buildings assigned to Seismic Performance Category Cor D in accordance with 780 CMR 1612.2.7	Note b.	Note b.

Note a. The specific standards referenced are those listed in ***Appendix A***.
Note b. Referenced criteria not applicable.

1705.8 Wood construction: *Structural inspections* of the fabrication process of wood structural elements and assemblies shall be in accordance with 780 CMR 1705.4. *Structural inspection* is required for nailing, bolting, structural gluing or other fastening of the structural seismic-resisting system.

1705.9 Prepared fill: The *structural inspections* for prepared fill shall be as required by 780 CMR 1705.9.1 through 1705.9.3. The approved report, required by 780 CMR 1804.1, shall be used to determine compliance.

1705.9.1 Site preparation: Prior to placement of the prepared fill, the structural inspector shall determine that the site has been prepared in accordance with the approved report.

1705.9.2 During fill placement: During the placement and compaction of the fill material, the structural inspector shall determine that the material being used and the maximum lift thicknesses comply with the approved report.

1705.9.3 Evaluation of in-place density: The structural inspector shall determine, at the approved frequency, that the in-place dry density of the compacted fill complies with the approved report.

1705.10 Pile foundations: *Structural inspections* of pile foundations are required as provided for in 780 CMR 1816.13.

1705.11 Pier foundations: *Structural inspection* is required for pier foundations.

1705.12 Wall panels and veneers: *Structural inspection* is required for exterior wall panels and their attachment to the building structure.

1705.13 ***Light gauge metal framing: Structural inspection is required for light gauge metal framing systems for roofs, floors, and load bearing walls and for light gauge metal framing in exterior curtain walls that have a story height greater than ten feet.***

1705.14 Special cases: *Structural inspections* shall be required for proposed work which is, in the opinion of the code official, unusual in its nature, such as:

1. Construction of materials and systems which are alternatives to materials and systems prescribed by 780 CMR.
2. Unusual design applications of materials described in 780 CMR.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in 780 CMR or in standards referenced by 780 CMR.

780 CMR 1706.0 DESIGN STRENGTHS OF MATERIALS

1706.1 Conformance to standards: The design strengths and permissible stresses of any structural material that is identified as to manufacture and grade by mill tests, or the strength and stress grade is otherwise confirmed to the satisfaction of the code official, shall conform to the specifications and methods of design of accepted engineering practice or the approved rules in the absence of applicable standards.

1706.2 New materials: For materials which are not specifically provided for in 780 CMR, the design strengths and permissible stresses shall be established by tests as provided for in 780 CMR 1708.0 and 1709.9.

780 CMR 1707.0 ALTERNATIVE TEST PROCEDURE

1707.1 General: In the absence of approved rules or other approved standards, the code official shall make, or cause to be made, the necessary tests and investigations; or the code official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in 780 CMR 106.0. The cost of all tests and other investigations required under the provisions of 780 CMR shall be borne by the permit applicant.

780 CMR 1708.0 TEST SAFE LOAD

1708.1 Where required: Where proposed construction is not capable of being designed by approved engineering analysis, or where proposed construction design method does not comply with the applicable material design standard listed in ***Appendix A***, the system of construction or the structural unit and the connections shall be subjected to the tests prescribed in 780 CMR 1710.0. The code official shall accept certified reports of such tests conducted by an *approved testing agency*, provided that such tests meet the requirements of 780 CMR and approved procedures.

780 CMR 1709.0 IN-SITU LOAD TESTS

1709.1 General: Whenever there is a reasonable doubt as to the stability or loadbearing capacity of a completed building, structure or portion thereof for the expected *loads*, an engineering assessment shall be required. The engineering assessment shall involve either a structural analysis or an in-situ load test, or both. The structural analysis shall be based upon actual material properties and other as-built conditions which affect stability or loadbearing capacity, and shall be conducted in accordance with the applicable design standard listed in ***Appendix A***. If the structural assessment determines that the loadbearing capacity is less than that required by the code, load tests shall be conducted in accordance with 780 CMR 1709.2. If the building, structure or portion thereof is found to have inadequate stability or loadbearing capacity for the expected *loads*, modifications to insure structural adequacy or the removal of the inadequate construction shall be required.

1709.2 Test standards: All structural components and assemblies shall be tested in accordance with the appropriate material standards listed in ***Appendix A***. In the absence of a standard listed in ***Appendix A*** that contains an applicable load test procedure, the test procedure shall be developed by a *registered professional engineer* and approved. The test procedure shall simulate the *loads* and conditions of application that the completed structure or portion thereof will be subjected to in normal use.

1709.3 In-situ load tests: All in-situ load tests shall be conducted in accordance with 780 CMR 1709.3.1 or 1709.3.2 and shall be supervised by a *registered professional engineer*. The test shall simulate the applicable loading conditions specified in 780 CMR 16 as necessary to address the concerns regarding structural stability of the building, structure or portion thereof.

1709.3.1 Load test procedure specified: Where a standard listed in ***Appendix A*** contains an applicable load test procedure and acceptance criteria, the test procedure and acceptance criteria in the standard shall apply. In the absence of specific *load* factors or acceptance criteria, the *load* factors and acceptance criteria in 780 CMR 1709.3.2 shall apply.

1709.3.2 Load test procedure not specified: In the absence of applicable load test procedures contained within a standard referenced by this code or acceptance criteria for a specific material or method of construction, such existing structure shall be subjected to a test load equal to two times the design *load*. The test load shall be left in place for a period of 24 hours. The structure shall be considered to have met successfully the test requirements if all of the following criteria are satisfied:

1. Under the design *load*, the deflection shall not exceed the limitations specified by the SER;
2. Within 24 hours after removal of the test load, the structure shall have recovered not less than 75% of the maximum deflection; and
3. During and immediately after the test, the structure shall not show evidence of failure.

780 CMR 1710.0 PRECONSTRUCTION LOAD TESTS

1710.1 General: In evaluating the physical properties of materials and methods of construction which are not capable of being designed by approved engineering analysis or which do not comply with the applicable material design standards listed in ***Appendix A***, the structural adequacy shall be predetermined based on the load test criteria established by 780 CMR 1710.2 through 1710.5.

1710.2 Load test procedures specified: Where specific load test procedures, *load* factors and acceptance criteria are included in the applicable design standards listed in ***Appendix A***, such test procedures, *load* factors and acceptance criteria shall apply. In the absence of specific test procedures, *load* factors or acceptance criteria, the corresponding provisions in 780 CMR 1710.3 shall apply.

1710.3 Load test procedures not specified: Where load test procedures are not specified in the applicable design standards listed in ***Appendix A***, the loadbearing capacity of structural components and assemblies shall be determined on the basis of load tests conducted in accordance with 780 CMR 1710.3.1 and 1710.3.2. Load tests shall simulate all of the applicable *loading* conditions specified in 780 CMR 16.

1710.3.1 Test procedure: The test assembly shall be subjected to an increasing superimposed load equal to not less than two times the superimposed design *load*. The test load shall be left in place for a period of 24 hours. The tested assembly shall be considered to have met successfully the test requirements if the assembly recovers not less than 75% of the maximum deflection within 24 hours after the removal of the test load. The test assembly shall then be reloaded and subjected to an increasing superimposed load until either structural failure occurs or the superimposed load is equal to 2½ times the load at which the deflection limitations specified in 780 CMR 1710.3.2 were reached, or the load is equal to 2½ times the superimposed design *load*. In the case of structural components and assemblies for which deflection limitations are not specified in 780 CMR 1710.3.2, the test specimen shall be subjected to an increasing superimposed load until structural failure occurs or the load is equal to 2½ times the desired superimposed design *load*. The allowable superimposed design *load* shall be taken as the lesser of:

1. The load at the deflection limitation given by 780 CMR 1709.3.2;
2. The failure load divided by 2.5; or
3. The maximum load applied divided be 2.5.

1710.3.2 Deflection: The deflection of structural members under the design *load* shall not exceed the limitations in 780 CMR 1604.5.

1710.4 Wall and partition assemblies: Loadbearing wall and partition assemblies shall sustain the test load both with and without window framing. The test load shall include all design *load* components.

1710.5 Test specimens: All test specimens and construction shall be representative of the materials, workmanship and details normally used in practice. The properties of the materials used to construct the test assembly shall be determined on the basis of tests on samples taken from the load test assembly or NON-TEXT PAGE on representative samples of the materials used to construct the load test assembly. All required tests shall be conducted or witnessed by an *approved agency*. Wall and partition assemblies shall be tested both with and without door and window framing.