



**Commonwealth of Massachusetts
Division of Professional Licensure
Office of Public Safety and Inspections**

1000 Washington Street, Suite 710
Boston, Massachusetts 02118

MASSACHUSETTS STATE BUILDING CODE - CODE CHANGE PROPOSAL FORM

Impacted code:	<input checked="" type="checkbox"/> Base Code <input type="checkbox"/> Residential Code	State Use Only	
Date Submitted:	April 26, 2021	Date Received:	04/27/2021
Code Section:	Sections 1703.1.3, 1704.2.1	Code Change Number:	05-03-2021
Name of proponent:	Kerry Sutton, PE		
Company / Organization represented, if any:	American Concrete Institute (ACI); ACI New England Chapter	Check <input type="checkbox"/> if representing self	
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PLEASE CHECK THE TYPE OF AMENDMENT PROPOSED

Change existing section language

Add new section

Delete existing section and substitute

Delete existing section, no substitute

Other, Explain: _____

PLEASE TYPE THE PROPOSED AMENDMENT BELOW. If you propose to change a section, please copy the original text from either the relevant model code and/or MA amendment and indicate the code edition. Indicate, with a ~~strike through~~, the text that you propose to delete. Please also indicate any new text in both *italic* and **red** font. Finally, for each proposal submitted, please provide the justification items requested below. Completed code amendment forms may be emailed to Dan Walsh, Director of Code Development and Manufactured Buildings at Dan.P.Walsh@mass.gov. Please attach additional pages as necessary. **PLEASE SEE ATTACHMENT**

Existing language:

Proposed changes:

Background and rationale:

Pros of the proposed change:

Cons of the proposed change:

Estimated impact on life safety:

Estimated impact on cost:



Attachment

IBC 2021

CHAPTER 17

SPECIAL INSPECTIONS AND TESTS

SECTION 1703

APPROVALS

Add new language as follows:

1703.1.3 Personnel. An approved agency shall employ experienced personnel educated in conducting, supervising, and evaluating tests and special inspections.

1703.1.3.1 Concrete Testing Personnel. Individuals with current credentials as provided in Table 1704.2 or equivalent credentials approved by the building official, shall be considered qualified for sampling and testing of concrete.

SECTION 1704

SPECIAL INSPECTIONS AND TESTS, CONTRACTOR RESPONSIBILITY AND STRUCTURAL OBSERVATIONS

Add new language as follows:

1704.2.1 Special inspector qualifications. Prior to the start of the construction, the *approved agencies* shall provide written documentation to the building official demonstrating the competence and relevant experience or training of the special inspectors who will perform the special inspections and tests during construction. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. *The special inspector shall be qualified in accordance with Table 1704.2.* These qualifications are in addition to qualifications specified in other sections of this code.

The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided they qualify as special inspectors.

Add new Table 1704.2 ‘Minimum Special Inspector Qualifications’ as follows:

<u>TABLE 1704.2 MINIMUM SPECIAL INSPECTOR QUALIFICATIONS</u>			
<u>Category of Testing and Inspection</u>	<u>Minimum Qualifications (refer to key at end of Table)</u>		
	<u>Shop Testing or Inspection</u>	<u>Field Testing or Inspection</u>	<u>Review Testing, Certification, & Lab Reports</u>
<u>1704.2.5 Inspection of Fabricators</u>			
	<u>Pre-cast concrete</u>	<u>A, C or E</u>	
	<u>Structural steel construction</u>	<u>C, F or G</u>	

<u>Wood construction</u>	<u>A</u>		
<u>Cold formed metal construction</u>	<u>A</u>		
1705.2, 1705.10, 1705.11& 1705.12 Steel Construction			
<u>Verification of welding consumables, filler metals, procedure specifications, procedure qualification records and personnel performance qualification records</u>			<u>C or F</u>
<u>Nondestructive testing of welding</u>	<u>G</u>	<u>G</u>	
<u>Inspection of welding</u>	<u>C or F</u>	<u>C or F</u>	
<u>Verification of fabricator and erector documents as listed in AISC 360, chapter N, paragraph 3.2</u>			<u>A or C</u>
<u>Material verification of weld filler materials</u>			<u>C or F</u>
<u>Inspection of high strength bolting and steel frame joint Details</u>		<u>A or C</u>	
<u>Inspection of embedments</u>		<u>A, C or F</u>	
<u>Inspection of steel elements of composite construction</u>		<u>A, C or F</u>	
<u>Verification of reinforcing steel, cold formed steel deck and truss materials</u>			<u>A, C or F</u>
<u>Inspection of reinforcing steel, cold formed steel deck and trusses</u>		<u>A or C</u>	

TABLE 1704.2 MINIMUM SPECIAL INSPECTOR QUALIFICATIONS

<u>Category of Testing and Inspection</u>	<u>Minimum Qualifications (refer to key at end of Table)</u>		
	<u>Shop Testing or Inspection</u>	<u>Field Testing or Inspection</u>	<u>Review Testing, Certification, & Lab reports</u>

1705.3 & 1705.12 Concrete Construction			
<u>Reinforcing placement, cast-in-place bolts, post installed anchors concrete and shotcrete placement and curing operations. Inspection of formwork for shape, location and dimensions</u>		<u>A, C or H</u>	
<u>Pre-stressing steel installation</u>		<u>A, C, D or E</u>	
<u>Erection of pre-cast concrete members</u>		<u>A, C or H</u>	
<u>Concrete field sampling and testing</u>		<u>A or J</u>	
<u>Concrete strength testing</u>		<u>N</u>	
<u>Review certified mill reports</u>			<u>A or C</u>
<u>Verify use of required design mix</u>		<u>A, C, I or J</u>	
<u>Pre-stressed (pre-tensioned) concrete force application</u>	<u>A, C or E</u>		
<u>Post-tensioned concrete force application</u>		<u>A, C or D</u>	
<u>Review of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs</u>		<u>A, C, D or H</u>	
<u>Reinforcing steel weldability, reinforcing welding, weld filler material</u>		<u>C or F</u>	
<u>Testing of welding of reinforcing steel</u>		<u>G</u>	
<u>Post-installed concrete anchor inspection</u>	<u>A or O</u>	<u>A or O</u>	
<u>Shotcrete installation inspection</u>		<u>A or P</u>	

1705.4 Masonry

<u>Verification of f'_m and f'_{AAC}</u>		<u>A, C, L or M</u>	
<u>Mortar joint construction, grout protection and placement, materials proportion, type/size/location of reinforcement, structural elements, anchorage, and connectors</u>		<u>A, C or K</u>	
<u>Observe preparation of masonry prisms for testing of compressive strength of masonry, f'_m and f'_{AAC}</u>		<u>A, C, K, L or M</u>	
<u>Inspection of welding of reinforcing steel</u>		<u>C or F</u>	
<u>Testing of welding of reinforcing steel</u>		<u>G</u>	

1705.6 & 1804 Soils

<u>Observe site preparation, fill placement testing of compaction for compliance with the construction documents for the project</u>		<u>A, C, I or L</u>	
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<u>Observe test bearing materials below shallow foundations for ability to achieve design bearing capacity</u>		<u>A, C, L or I (Level III)</u>	
<u>Review compaction testing for compliance with the construction documents for the project</u>			<u>A</u>
<u>1705.5, 1705.10, 1705.11 & 1705.12 Wood Construction</u>			
<u>Observe structural panel sheathing, size of framing members, nail or staple diameter and length, number of fastener lines, and spacing of fastener lines and fasteners for compliance with construction documents for the project</u>		<u>A</u>	
<u>Observe temporary and permanent truss member restraint/bracing, field gluing of elements. Observe bolting, anchoring or other fastening of: shear walls, diaphragms, drag struts, braces and hold-downs</u>		<u>A</u>	
<u>1705.7, 1705.8, 1705.9 & 1810 Pile and Pier Foundations</u>			
<u>Observe installation</u>		<u>A or L</u>	
<u>Observe load tests</u>		<u>A</u>	
<u>TABLE 1704.2 MINIMUM SPECIAL INSPECTOR QUALIFICATIONS</u>			
<u>Category of Testing and Inspection</u>	<u>Minimum Qualifications (refer to key at end of Table)</u>		
	<u>Shop Testing or Inspection</u>	<u>Field Testing or Inspection</u>	<u>Review Testing, Certification, & Lab Reports</u>
<u>1705.13 Sprayed Fire-Resistant Materials</u>			
<u>Observe surface conditions, application, average thickness and density of applied material, and cohesive/adhesive bond</u>		<u>A or C</u>	
<u>1705.14 Mastic and Intumescent Fire-Resistant Coatings</u>			
<u>Observe application compliance with AWCI 12-B</u>		<u>A or C</u>	
<u>1705.15 Exterior Insulation and Finish Systems</u>			
<u>Inspect EIFS systems</u>		<u>A, B, C or M</u>	
<u>1705.1 Special Cases</u>			
<u>Work of unusual or special nature</u>		<u>A, B or M</u>	
<u>1705.16 Fire-Resistant Penetrations and Joints</u>			
<u>See Requirements of IBC Sections 1705.16.1 and 1705.16.2</u>		<u>A or B</u>	
<u>1705.10, 1705.11 & 1705.12 Seismic and Wind Resistance</u>			
<u>Periodic inspection of fabrication, installation and/or anchorage of building systems and components</u>		<u>A</u>	

KEY:

- A. Professional Engineer (PE) competent in the specific task area or graduate of accredited engineering/engineering technology program under the direct supervision of a PE.
- B. Registered Architect (RA) or graduate of accredited architecture/architecture technology program under the direction of a RA.
- C. International Code Council (ICC) Special Inspector Certification specific to the particular material and testing methodology applicable to each Category of Testing and Inspection listed in the table.
- D. Post-tensioning Institute (PTI) Certification, Level 2, bonded or unbonded as applicable.
- E. Pre-stressed Concrete Institute (PCI) Certified Inspector.
- F. American Welding Society (AWS) Certified Welding Inspector (CWI) or AWS Certified Associate Welding Inspector working under the direct on-site supervision of a CWI.
- G. American Society for Nondestructive Testing (ASNT) Level II certification, or a Level III certification if previously certified as a Level II in the particular material and testing methodology applicable to each Category of Testing and Inspection listed in the table.
- H. American Concrete Institute (ACI) Concrete Construction Special Inspector.
- I. National Institute for Certification in Engineering Technologies (NICET) Level II or higher certification

specific to the particular material and testing methodology applicable to each Category of Testing and Inspection listed in the table.

J. ACI Concrete Field-Testing Technician with Grade 1 certification.

K. ICC/The Masonry Society Masonry (TMS) Construction Inspector Certification.

L. NICET Certified Engineering Technologist (CT).

M. Other Qualified Special Inspector as approved by the Building Official.

N. American Concrete Institute (ACI) Strength Testing Technician

O. American Concrete Institute (ACI) Post-Installed Concrete Anchor Installation Inspector

P. American Concrete Institute (ACI) Shotcrete Inspector

Background and rationale - This proposal addresses the need to better ensure proper sampling, testing, and inspection of structural elements. Improper testing and inspection may result in deficiencies regarding the performance of structural concrete. This is especially a concern for concrete, as it is one of the few structural materials that are not in their final form and condition until after being placed on the construction site. It is important that qualified individuals conduct sampling, testing, and inspection to ensure proper performance.

Improper sampling and testing can lead to costly added testing and construction delays. In some instances, unnecessary removal and replacement of concrete. The latter may result in challenges to ensure proper structural integrity and load paths.

This proposal is modelled after modification adopted by other authorities having jurisdiction to include requirements for various building materials and systems. The Georgia Building Code now includes a table of minimum qualifications for certified inspectors. See pages 10 through 12 of the attached file, [IBC_2020_amendments.pdf](#). These amendments to add personnel qualifications were introduced in the Georgia Building code by members of the Structural Engineers Association of Georgia, circa 1996, and have proven to be a valuable tool for the building officials and all parties involved in or impacted by inspection and testing.

Benefits (Pros) – Enhanced confidence that concrete will perform as anticipated. When results of tests or inspections are not properly representative of the performance of the concrete, this could lead to huge delays and cost. Direct costs may be additional tests, taking and testing cores, or rejection and removal and replacement of the concrete. All of these could also have indirect costs due to construction delays. This proposal identifies personnel qualified to conduct inspections and tests to aid and better ensure the public, building official, owners, designers, contractors, and material suppliers that tests and inspections are conducted properly and are representative of the intended performance of structural concrete elements.

Challenges (Cons) - None. Tests and inspections are already required, but need assurance that individuals are qualified to conduct sampling testing and inspections

Estimated impact on life safety – This code change proposal will assist the building official in the determination of qualifications of individuals conducting sampling, testing and inspection of construction materials, including structural concrete. When these duties are performed by qualified personnel, there is greater assurance the minimum qualifications of the code will be met, thus having a positive impact on life safety.

Estimated Cost Impact - The code change proposal will not increase or decrease the cost of construction. This proposal increases the ease for the building official to determine the qualifications of individuals qualified to conduct sampling, testing and inspection of structural concrete.

Letters of Support:

[ACI New England Chapter](#)