



DEPARTMENT OF ADMINISTRATIVE SERVICES

PROPOSED CHANGE OF THE CONNECTICUT STATE BUILDING CODE AND FIRE SAFETY CODE

DATE SUBMITTED: _____

CODE INFORMATION

Proposed change to: Building Code Fire Safety Code

Code section(s): _____

PROPONENT INFORMATION

Name: _____ Representing: _____

Telephone: _____ Email: _____

Address: _____
Street Address Town State Zip Code

PROPOSAL INFORMATION

Description of change and reason for change (attach additional information as needed):

Proposed text change, addition or deletion (attach additional information as needed):

Supporting data and documents (attach additional information as needed)

This Proposal is original material. (Note: Original material is considered to be the submitter's own idea based on or as a result of his/her own experience, thought or research and, to the best of his/her knowledge, is not copied from another source.)

This Comment is not original material, its source (if known) is as follows: (such as material / code development proposal from a prior development cycle or proposal submitted to model code committee etc.)

I would like to make an in-person presentation of my proposal.

Release

I hereby grant the State of Connecticut full rights to the use of this material without benefit to me, including, but not limited to, publication and reproduction rights.

Proponent's Signature

Printed Name

PLEASE EMAIL (PREFERRED) TO DAS.CodesStandards@CT.GOV OR MAIL OR FAX (SEE BELOW)

Department of Administrative Services
Office of the State Building Inspector
450 Columbus Boulevard, Suite 1303
Hartford, CT 06103
Tel: 860-713-5900 Fax: 860-713-7410
Affirmative Action/Equal Opportunity Employer

12/29/16

Attachment

**IBC 2021
CHAPTER 17**

SPECIAL INSPECTIONS AND TESTS

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. Individuals conducting special inspections and tests shall be qualified in accordance with Table 1704.2, or shall be otherwise approved by the building official. 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, G or H</u>		
<u>Wood construction</u>	<u>A</u>		
<u>Cold formed metal construction</u>	<u>A</u>		
<u>1705.2, 1705.10, 1705.11 & 1705.12 Steel Construction</u>			
<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>H</u>	<u>H</u>	
<u>Inspection of welding</u>	<u>C or F</u>	<u>C or F</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</u>		

	Table)		
	<u>Shop Testing or Inspection</u>	<u>Field Testing or Inspection</u>	<u>Review Testing, Certification, & Lab reports</u>
<u>1705.2, 1705.10, 1705.11 & 1705.12 Steel Construction, continued</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, F or G</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, F or G</u>	
<u>Inspection of steel elements of composite construction</u>		<u>A, C, F or G</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>	
<u>1705.3 & 1705.12 Concrete</u>			
<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 I</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 I</u>	
<u>Review certified mill reports</u>			<u>A or C</u>
<u>Verify use of required design mix</u>		<u>A, C 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 I</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>H</u>	
<u>Post-installed concrete anchor inspection</u>	<u>A or M</u>	<u>A or M</u>	
<u>Shotcrete installation inspection</u>		<u>A or N</u>	
<u>1705.4 Masonry</u>			
<u>Verification of f'_m and f'_{AAC}</u>		<u>A, C or L</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 or L</u>	
<u>Inspection of welding of reinforcing steel</u>		<u>C or F</u>	
<u>Testing of welding of reinforcing steel</u>		<u>H</u>	
<u>1705.6 & 1804 Soils</u>			
<u>Observe site preparation, fill placement testing of compaction for compliance with the construction documents for the project</u>		<u>A, B, C, J or L</u>	
<u>Observe test bearing materials below shallow foundations for ability to achieve design bearing capacity</u>		<u>A, B, C, L or J (Level III)</u>	
<u>Review compaction testing for compliance with the construction documents for the project</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>1705.5, 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 or C</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 or C</u>	
<u>1705.7, 1705.8, 1705.9 & 1810 Pile and Pier Foundations</u>			
<u>Observe installation</u>		<u>A, B or L</u>	
<u>Observe load tests</u>		<u>A or B</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 or C</u>	
<u>1705.1 Special Cases</u>			
<u>Work of unusual or special nature</u>		<u>A</u>	
<u>1705.16 Fire-Resistant Penetrations and Joints</u>			
<u>See requirements of IBC Section 1705.16.1 and 1705.6.2</u>		<u>A</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. Licensed Structural Engineer (SE) or Professional Engineer (PE) specializing in the design of building structures, or graduate engineer who has passed the Fundamentals of Engineering examination, Engineer-in-Training (EIT), under the direct supervision of an SE or PE.
- B. Geotechnical Engineer (GE), a licensed Professional Engineer (PE) specializing in soil mechanics and foundations.
- 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 Welding Society (AWS)/American Institute of Steel Construction (AISC) certified structural steel inspector.
- H. 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.
- I. American Concrete Institute (ACI) Concrete Construction Special Inspector.
- J. 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.
- K. ICC/The Masonry Society Masonry (TMS) Construction Inspector Certification.
- L. NICET Certified Engineering Technologist (CT).
- M. American Concrete Institute (ACI) Post-Installed Concrete Anchor Installation Inspector
- N. American Concrete Institute (ACI) Shotcrete Inspector

Background and rationale - This proposal addresses the need to better ensure proper inspection of structural elements. Improper 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 inspections to ensure proper performance.

The State of Connecticut Code CASE Form 101, Statement of Special Inspections, Key for Minimum Qualifications of Inspection Agents, 2004, lists specific certifications or licenses for individuals performing a stipulated test or inspection, as deemed appropriate by the Registered Design Professional. Updating and incorporating the requirements of Form 101 directly into the building code better communicates to all parties involved in special inspections (design professionals, building officials, testing agencies, inspectors, owners, and contractors) qualifications for conducting special inspections. Including a new table, Table 1704.2 Minimum Special Inspector Qualifications, in the Connecticut State Building Code will provide additional clarification and reinforce the importance of qualification requirements for all personnel performing special inspection and testing activities.

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](#).

Benefits – Enhanced confidence that concrete will perform as anticipated. Results of inspections that are not representative of the performance of the concrete, could lead to huge delays and cost. This proposal identifies personnel qualified to conduct inspections 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. This proposal does not preclude individuals already permitted to conduct inspections but clearly communicates to the building official the appropriate qualifications for individuals permitted to conduct special inspections.

Estimated impact on life safety – This code change proposal will assist the building official in the determination of qualifications of individuals conducting inspections of structural elements 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.

Recommendation -

The American Concrete Institute, as a professional society whose mission includes working to facilitate the use and adoption of current concrete technology to assure the desired performance for the benefit of the public, encourages the committee to approve of this code change as submitted.

Letters of Support:

ACI New England Chapter
Drakely Pool Company



May 18, 2021

Department of Administrative Services
Office of the State Building Inspector
450 Columbus Boulevard, Suite 1303
Hartford, CT 06103

Subject: Support for Provisions that Require Qualified Individuals for Sampling, Testing, and Inspection of Concrete Code Change Proposals

Codes and Standards Committee Members:

This letter is to recommend approval provisions that set minimum requirements for individuals engaged in the sampling and testing of concrete and inspection of structural elements to the *Connecticut State Building Code* as presented in the code change proposals initiated by the American Concrete Institute.

The American Concrete Institute – New England Chapter represents concrete producers, designers, contractors, and material testing labs throughout Connecticut, and the region. These organizations employ over 3,600 people and contribute over \$325 million to the Connecticut economy.

Cast-in-place concrete is one of the few building materials formed, cured, and otherwise conditioned to create the final product on the construction site. Proper sampling and testing of cast-in-place concrete and specimens is crucial to assure quality concrete that will satisfy the intent of the building code. The code, directly or indirectly through referenced standards, establishes minimum requirements for the type and frequency of sampling, testing, and inspection. However, the code is remiss in that it does not establish or provide necessary direction the building official regarding minimum qualifications for individuals conducting sampling, tests, and inspections of structural concrete. The proposed modifications to the Building Code identifies qualified individual to perform these duties and establishes a level of competency to aid the building official approving other persons for the purpose of sampling, testing, and inspecting.

Examples of specific existing referenced standard language are:

- ACI 318 *Code Requirements for Structural Concrete*, referenced in the CT State Building Code:
 - 26.13.1.2 Inspection of concrete construction shall be conducted by the licensed design professional responsible for the design, a person under the supervision of the licensed design professional, or a qualified inspector.
- ASTM C94 *Standard Specification for Ready-Mixed Concrete* referenced in ACI 318:
 - 7.2 Tests of concrete required to determine compliance with this specification shall be made by a certified technician in accordance with Practice C1077.
- ASTM C1077
 - 6.1.3 Personnel performing laboratory and field testing shall possess current certification(s) that includes a written and performance examination for each relevant standard identified

These standards are applicable to any use of structural concrete, not just buildings. Thus, the needed guidance to assist the building official in the approval process of qualified personnel is not specifically included in the standards. These proposed modifications are extremely important for the building officials, owners, public and all effected entities in the building design and construction process understand the appropriate levels of competency to perform sampling, testing and inspection.

In addition to appropriate quality assurances, qualified individuals are necessary to reduce the frequency of improper sampling and testing which results in additional direct costs related to more expensive sampling (coring) and testing and indirect costs due to construction delays.

We find that it is increasingly more important to require qualified individuals because of significant changes in and increased complexities of mix designs, use of high strength and high-performance concrete, combined with improved engineering procedures that permit more economical use and sizing of concrete elements. Sampling and testing of concrete needs to have a level of precision commensurate with the current design and construction requirements.

We have reviewed the code change proposals initiated by ACI and respectfully request that these proposals be approved for inclusion in the Connecticut State Building Code.

Thank you in advance for your consideration of this recommendation.

Sincerely,

A handwritten signature in blue ink that reads "R. Brett Holland". The signature is written in a cursive, flowing style.

R. Brett Holland, Ph.D., P.E. (MA, AL, NY, TX, GA, RI), S.E. (IL)
President of the Board of Directors, ACI New England Chapter



74 HICKORY LANE | BETHLEHEM | CONNECTICUT 06751
(860) 274 - 7903 | WWW.DRAKELEYPOLLS.COM
HIC #567297 | PLM. #280149

April 27, 2021

Department of Administrative Services
Office of the State Building Inspector
450 Columbus Boulevard, Suite 1303
Hartford, CT 06103

Subject: Support for Provisions that Require Qualified Individuals for Sampling, Testing, and Inspection of Concrete Code Change Proposals

Codes and Standards Committee Members:

This letter is to recommend approval provisions that set minimum requirements for individuals engaged in the sampling and testing of concrete and inspection of structural elements to the *Connecticut State Building Code* as presented in the code change proposals initiated by the American Concrete Institute.

Our firm is directly involved in the design and construction of concrete swimming pools. The volume of work ranges between 1500 cubic yards annually and our work is being performed throughout Connecticut. Drakeley Pool Company, located in Bethlehem, employs 25 Connecticut residents, and directly contributes \$3 million dollars to the Connecticut economy and \$45,000 in revenue for the state.

Shotcrete and/or cast-in-place processes for concrete are two of the applications for concrete materials formed, cured, and otherwise conditioned to create the final product on the construction site. Proper sampling and testing of shotcrete and cast-in-place concrete and specimens is crucial to assure quality concrete that will satisfy the intent of the building code. The code, directly or indirectly through referenced standards, establishes minimum requirements for the type and frequency of sampling, testing, and inspection. However, the code is remiss in that it does not establish or provide necessary direction the building official regarding minimum qualifications for individuals conducting sampling, tests and inspections of structural concrete. The proposed modifications to the CT Building Code identifies qualified individual to perform these duties and establishes a level of competency to aid the building official approving other persons for the purpose of sampling, testing and inspecting.

Examples of specific existing referenced standard language are:



- ACI 318 *Code Requirements for Structural Concrete*, referenced in the CT State Building Code: 26.13.1.2 Inspection of concrete construction shall be conducted by the licensed design professional responsible for the design, a person under the supervision of the licensed design professional, or a qualified inspector.

ASTM C94 *Standard Specification for Ready-Mixed Concrete* referenced in ACI 318:

7.2 Tests of concrete required to determine compliance with this specification shall be made by a certified technician in accordance with Practice C1077.

ASTM C1077

6.1.3 Personnel performing laboratory and field testing shall possess current certification(s) that includes a written and performance examination for each relevant standard identified

These standards are applicable to any use of structural concrete, not just buildings. Thus, the needed guidance to assist the building official in the approval process of qualified personnel is not specifically included in the standards. These proposed modifications are extremely important for the building officials, owners, public and all effected entities in the building design and construction process understand the appropriate levels of competency to perform sampling, testing and inspection.

In addition to appropriate quality assurances, qualified individuals are necessary to reduce the frequency of improper sampling and testing which results in additional direct costs related to more expensive sampling (coring) and testing and indirect costs due to construction delays.

We find that it is increasingly more important to require qualified individuals because of significant changes in and increased complexities of mix designs, use of high strength and high-performance concrete, combined with improved engineering procedures that permit more economical use and sizing of concrete elements. Sampling and testing of concrete needs to have a level of precision commensurate with the current design and construction requirements.

We have reviewed the code change proposals initiated by ACI and respectfully request that these proposals be approved for inclusion in the Connecticut State Building Code.

Thank you in advance for your consideration of this recommendation.

Sincerely,

William T. Drakeley Jr.
Managing Member
Drakeley Pool Company