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T E C H N I C A L B U L L E T I N

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Topic: Structural Tests and Special Inspections

This document is a guideline to assist code enforcement officials and design professionals in their efforts to secure compliance with Chapter 17 of the *Building Code of New York State*.

List of Abbreviations

ACI; American Concrete Institute

AWS; American Welding Society

BCNYS; *Building Code of New York State*

CASE; Council of American Structural Engineers

CEO; Code Enforcement Official

RDP; New York State Registered or Licensed Design Professional

ICC; International Code Council

SI; Special Inspection(s), Special Inspector(s), Special Inspection Agency

UC; Uniform Fire Prevention and Building Code (Uniform Code)

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What is special inspection?

Special Inspection is the monitoring of the materials and workmanship that are critical to the integrity of the building structure. It is a review of the work of the contractors and their employees to assure that the approved plans and specifications are being followed and that relevant codes and reference standards are being observed. The special inspection process is in addition to the inspections conducted by the CEO and by the RDP as part of structural observations.

According to BCNYS Section 1702, SI, is required of the materials, installation, fabrication, erection and placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards.

It has been said that Chapter 17 is only applicable to buildings that are considered “*special*,” or to state otherwise, applicable only when the building has been classified as special due to jurisdictional significance. That opinion is incorrect. The applicability of BCNYS Chapter 17 must be considered for all buildings designed in accordance with the BCNYS.

As part of the general requirements of BCNYS Section 1704, Special Inspections, a statement of SI, prepared by the RDP shall be submitted and approved by the CEO prior to permit issuance (see 1704.1.1). At the completion of the work, a written statement of structural observations per BCNYS Section 1709 along with the final report of special inspections must be received prior to the final inspection and issuance of the certificate of occupancy. In an effort to standardize the SI requirements of the BCNYS, the CEO may choose to incorporate SI provisions and

requirements with their standard building permit application forms.

Exception 1 of BCNYS Section 1704.1 releases the special inspection requirement for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the CEO. This exception is not intended to exempt special inspection requirements that the BCNYS otherwise requires.

The phrase “*work of a minor nature*” is stated to emphasize that special inspections do not apply to all inspections that will happen during the course of a building construction project. As stated earlier, SI applies to situations where special expertise is required to ensure compliance with the approved construction documents. For example, special inspections are inspections made *in addition* to the regular inspections made by the CEO in accordance with BCNYS Section 109.

The phrase “*conditions in the jurisdiction*” refer to situations where CEO has the expertise to perform the required special inspections. For example, a CEO may be an AWS Certified Welding Inspector and choose to complete the special inspections required by Table 1704.3 for welding.

The ICC and CASE have developed guidelines and standard forms and procedures to assist with the standardization and implementation of special inspections requirements into a code enforcement program. The guidelines, along with the respective standard forms are listed below and are available from ICC and CASE.

1. *Model Program for Special Inspection*, International Code Council

- A. Special-inspection and Testing Agreement
- B. Special-inspection and Testing Schedule
- C. Special-inspection Record
- D. Daily and Weekly Report Forms
- E. Discrepancy Notice
- F. Final Report Form

Note: ICC publications can be purchased from ICC website, www.iccsafe.org.

2. *National Practice Guidelines for Special Inspections*, Council of American Structural Engineers, Prepared by the CASE Special Inspections Subcommittee.

- A. CASE Form 101, Statement of Special Inspections
- B. CASE Form 101, Schedule of Special Inspection Services
- C. CASE Form 102, Final Report of Special Inspections

Note: The CASE documents are available for use at the following web address:

Guidelines: www.acec.org/about/case_pdf/spec_inspect_guidelines.pdf (provide underscore on spaces)

Statement & schedule: www.acec.org/about/case_pdf/spec_inspect_form.pdf

Final Report (Form 102): www.acec.org/about/case_pdf/spec_inspect_report.pdf

In accordance with BCNYS Section 1704.1.1, the *Statement of Special Inspections* shall include the following items:

- 1. A complete list of materials and work requiring SI.
- 2. The inspections to be performed and the frequency to perform them.
- 3. A list of qualified individuals, agencies or firms intended to be retained for conducting such inspections.

The RDP may choose to use the forms available from ICC and CASE in preparing the *Statement of Special Inspections*.

During the course of a building construction project things change. Any changes made to the approved construction documents must be approved by the CEO. Likewise, the *Statement of Special Inspections* must be maintained and approved by the CEO when modifications are made. Here are two examples:

Example 1:

During the course of a steel frame erection the welding SI becomes injured and the RDP acting as the owner's

agent is forced to employ another SI that was not identified on the *Statement of Special Inspections*. At this point, the RDP must modify the *Statement of Special Inspections* to include the SI who will continue the work. Again, this modification is subject to the approval of the CEO.

Example 2:

The owner has not retained the RDP for services during the construction phase of a building construction project. During the construction phase, the owner decides to add a story and increase potential number of tenants. The owner employs a different RDP to design the modifications. At this point, the newly retained RDP must provide a modified *Statement of Special Inspections* as well as the modified design to the CEO for approval.

Responsibilities

The special inspection process is in addition to those inspections conducted by the CEO and by the RDP of record as part of periodic structural observation. Good communication between the SI and the RDP(s), contractor(s) and the CEO is essential to project quality assurance.

Responsibilities of the CEO

Of all of the parties involved in the building construction process, the CEO is the only one with the legal authority to enforce the special inspection provisions of the BCNYS. The employment of a SI does not relieve the CEO from any of the inspection requirements of BCNYS Section 103.

The CEO shall:

1. *Review submitted documents for compliance with SI requirements.* The CEO is charged with the legal authority to review the plans, specifications, special inspection program, and other documents for compliance with the BCNYS
2. *Approve the SI program.* Prior to the issuance of a building permit, the CEO is responsible for approving the SI program prepared by the RDP. The CEO may request a preconstruction meeting to review the project with all the members of the construction team.
3. *Approve SI.* The CEO is responsible for determining the competence of the SI's for the types of work they will be inspecting.
4. *Monitor SI activities.* The CEO should monitor the SI activities to assure that the approved SI are performing their duties when work requiring SI is in progress.
5. *Review SI reports.* The CEO receives and reviews SI reports.
6. *Perform final inspection.* The CEO shall not perform the final inspection or issue a certificate of occupancy until the final SI report has been reviewed and approved.

Responsibilities of the Special Inspector

The SI shall:

1. *Notify the contractor* of their presence and responsibilities at the job site.
2. *Observe assigned work.* The SI shall inspect all work for which they are responsible for conformance with the plans and specifications approved by the CEO. Perform SI in a timely manner to avoid delay of work.
3. *Report nonconforming items.* SI shall bring all nonconforming items to the immediate attention of the contractor for correction. If any such item is not resolved in a timely manner or is about to be incorporated into the work, the CEO and the RDP shall be notified immediately and the item noted in the SI's written report. The SI shall write a separate report to be posted at the job site regarding noted discrepancies that should contain, as a minimum, the following information about each nonconforming item:
 - a. Description and exact location
 - b. Reference to applicable plan sheets, details and specifications
 - c. Resolution or corrective action taken and the date.
4. *Provide timely reports.* The SI shall complete written SI reports for each visit to the site. The SI shall furnish these reports directly to the CEO, the RDP, and others as designated. These reports shall be organized on a daily format and will be submitted to the CEO at the approved times or frequency. In the reports the SI should:
 - a. Describe SI and tests made, with applicable locations.
 - b. Indicate how nonconforming items were resolved.
 - c. List unresolved items, parties notified, time and method of notification.

- d. Itemize changes authorized by the RDP and approved by the CEO.
5. *Submit final report.* SI's shall submit a final, signed report to the CEO stating that all items requiring SI and testing were fulfilled and reported and, to the best of their knowledge, in conformance with the approved plans and specifications. Items not in conformance, unresolved items, or any discrepancies in inspection coverage (i.e., missed inspections, periodic inspection when continuous inspection was required, etc.) should be specifically itemized in this report.

Responsibilities of the Owner

The project owner or the RDP acting as the owner's agent is responsible for employing the SI. The owner or the RDP acting as the owner's agent must also maintain the *Statement of Special Inspections* and obtain the approval of the CEO if any changes are necessary to be made.

Responsibilities of the RDP

The RDP has many duties and responsibilities related to SI, including the following:

1. *Prepare SI program.* The RDP shall list the items for which SI is required. The RDP should coordinate with the owner in the selection of who will serve as SI. The RDP is required to list all SI and their duties within the SI program.

The standard of the industry for employing a qualified testing and inspection agency is its compliance with the requirements of ASTM E-329. Additionally, when employing a SI, the following factors should be considered:

- a. Experience with projects of similar complexity.
 - b. Sufficient staffing of qualified SI.
 - c. Proximity of inspection and testing facilities.
 - d. The capabilities for inspection at remote locations.
2. *Respond to field discrepancies.* If contracted to do so, the RDP shall respond to the SI reports of uncorrected, noncomplying items and shall approve remedial measures. The CEO must approve any remedial measures or changes to the approved construction documents.
 3. *Review shop drawings and submit revisions to approved plans.* The RDP shall review and approve shop drawings and submit to the CEO any deviations from the approved plans for approval and incorporation into the building construction project.

Responsibilities of the Contractor/Construction Manager

1. *Notify the SI.* The holder of the building permit or their duly authorized agent is responsible for notifying the SI regarding individual inspections required by the approved plans and specifications. Adequate notice shall be provided so that the SI has time to become familiar with the project.
2. *Provide access to the approved construction documents.* The contractor/construction manager is responsible for providing the SI with direct access to the approved plans and specifications.
3. *Provide safe access to the work to be inspected.*

Qualifications of the SI

The SI must have the expertise necessary to ensure compliance with the approved construction documents and referenced standards. The easiest way to demonstrate competence as a SI is to be certified by a recognized organization. Certification typically means that the individual has successfully completed a course and an examination. Included in the table below are some certifications that qualified SI could hold.

The actual persons conducting the tests and inspections must be qualified. The RDP can act as the SI provided the RDP has the minimum qualifications and is approved by the CEO. When using the following table of SI qualifications a few things must be considered. First, references are made to certifications given by the ICC. Since little time has elapsed between the effective date of the newly revised UC and the date of this publication, the existence of persons holding ICC certifications may not be prevalent or, in some circumstances, available. Secondly, the table represents the preferred qualifications for special inspectors. Since the previous UC did not

specify minimum requirements for SI, there may be many individuals who, because of their experience, may be sufficiently qualified to act in the role of the SI. The UC gives the CEO the ability to make such a judgement and approve who will serve as the SI. The table includes the word *relevant* to describe experience for persons not holding formal certifications. For the purposes of determining qualifying *relevant* experience, the CEO should consider *relevant* to mean that the prospective SI has experience performing the inspections for projects of similar complexity.

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Attached Table:
Special Inspector Qualifications

Special Inspector Qualifications

Category	Code Reference	Minimum Qualifications
<i>*Reinforced Concrete</i>	1704.4	<ol style="list-style-type: none"> 1. Current ICC Reinforced Concrete Special Inspector or ACI Concrete Construction Inspector. 2. Concrete field testing can be by an ACI Concrete Field Testing Technician with Grade 1 Certification. 3. Engineer-in-Training (EIT) with relevant experience. 4. New York State Licensed Professional Engineer (P.E.) with relevant experience.
<i>Prestressed Concrete</i>	Table 1704.4, Items 8 & 10	<p>Pretension Tendons</p> <ol style="list-style-type: none"> 1. Current ICC Reinforced Concrete certification and ICC prestressed concrete certification and ACI Concrete Field Testing Technician with Grade 1 Certification plus one year relevant experience. 2. EIT with relevant experience. 3. P.E. with relevant experience. <p>Post-tension Tendons</p> <ol style="list-style-type: none"> 1. Current Post-Tensioning Institute (PTI) Certification. 2. EIT with relevant experience. 3. P.E. with relevant experience.
<i>Welding</i>	1704.3; Table 1704.3, Item 5; Table 1704.4, Item 2; 1707.2; 2208	<ol style="list-style-type: none"> 1. Current AWS Certified Welding Inspector. 2. Current ICC Structural Steel and Welding certificate plus one year of relevant experience. 3. Current Level II certification from the American Society for Nondestructive Testing (NDT). 4. Current NDT Level III provided previously certified as NDT level II.
<i>High-strength Bolting & Steel Frame Inspection</i>	1704.3.3; Table 1704.3	<ol style="list-style-type: none"> 1. Current ICC Structural Steel and Welding certificate and one year of relevant experience. 2. EIT with relevant experience. 3. P.E. with relevant experience.
<i>Masonry</i>	1704.5; Table 1704.5.1; Table 1704.5.3	<ol style="list-style-type: none"> 1. Current ICC Structural Masonry certificate and one year of relevant experience. 2. EIT with relevant experience. 3. P.E. with relevant experience.
<i>Sprayed Fire-Resistant Materials</i>	1704.11	<ol style="list-style-type: none"> 1. Current ICC Spray-Applied Fire Proofing certificate and one year of relevant experience. 2. EIT with relevant experience. 3. P.E. with relevant experience
<i>Excavation and Filling; Verification of Soils; Piling & Drilled Piers; Modular Retaining Walls</i>	1704.7; 1704.8; 1704.9; 1704.13	<ol style="list-style-type: none"> 1. Current Level II certification in geotechnical engineering technology/construction from the National Institute for Certification in Engineering Technologies (NICET). 2. EIT with relevant experience. 3. P.E. with relevant experience

<i>Inspection of Fabricators</i>	<i>1704.2</i>	<ol style="list-style-type: none"> 1. <i>Precast: Current ICC Reinforced Concrete plus one year relevant experience.</i> 2. <i>Bar Joist: see welding requirements.</i> 3. <i>Metal Building: see welding requirements.</i> 4. <i>Structural Steel: see welding requirements.</i>
<i>Exterior and Interior Architectural Wall Panels</i>	<i>1704.10</i>	<ol style="list-style-type: none"> 1. <i>P.E. with relevant experience.</i> 2. <i>EIT with relevant experience.</i> 3. <i>See the masonry requirements for the SI of masonry veneers subject to BCNYS Section 1704.10.</i>
<i>Exterior Insulation and Finish System</i>	<i>1704.12</i>	<ol style="list-style-type: none"> 1. <i>RDP with relevant experience.</i> 2. <i>EIT with relevant experience.</i>
<i>**Smoke Control</i>	<i>1704.14</i>	<ol style="list-style-type: none"> 1. <i>See the requirements in BCNYS Section 1704.14.2</i> 2. <i>The RDP responsible for design.</i>
<i>Seismic Resistance</i>	<i>1707; 1708</i>	<ol style="list-style-type: none"> 1. <i>See the applicable categories in this table.</i>

**Note: ACI has certifications for both field testing technicians and laboratory technicians*

***Certifications from National Environmental Balancing Bureau are available for this activity.*