



SPEAKING IN CODE

The Lowdown on Testing and Special Inspection Topics

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SPECIAL INSPECTION REVELATIONS



- *The project is an eight-story steel-frame office building with soils, concrete, masonry, and sprayed fire-resistant material elements, with a construction cost of more than \$20 million*
- *Contract documents state that the building should be built in accordance with the International Building Code (IBC) 2021*
- *The general contractor has no one on staff, including his subcontractors, who is even generally familiar with IBC code acceptance criteria*

✚ You may think this is... puzzling.

Is it a REVELATION to you that the project's builder may not have a single person on staff who is IBC code-savvy? I would not want to say that the revelation example cited here is typical; however, it certainly is commonplace in the industry and is happening right now all over the country. How is it possible that the developers and contractors behind a \$20-million eight-story project are only tangentially aware of the building codes they are legally required to follow? It's a long and complicated answer, loaded with ambiguous terms.

Part of the reason is that the contractor's culture and philosophy stem from the process of pricing, planning, and building the project in accordance with the construction documents (formerly referred to as specs and drawings). Even the IBC code defines special inspections as "inspections and tests to ensure compliance with the construction documents" (as well as the building code). Contractors have built structures from specs and drawings for more than 2,000 years (e.g., pyramids). General contractors are, understandably, a little set in their ways on this issue.

The second and most important part of this answer is that most contractors know the IBC code exists, but few know how it is structured. Most states have statewide building codes that take precedence over the IBC when the two conflict. It is imperative to remember that the IBC and the statewide code, combined, constitute the minimum building code acceptance criteria for all structural elements of the project. The construction documents can require more inspections and testing than the building code, but can never require fewer inspections and testing than the building code.

Many of the technical details that govern your work are not printed in the state building code itself (or the IBC code). Instead, they are part of what is known as “adopted by reference,” or external standards that are legally binding even though they are not printed word-for-word in the codebook. There are hundreds of model codes and standards adopted by reference in the IBC (Chapter 35). There are, in fact, more than 300 ASTM standards adopted by reference in the IBC code.

While a contractor is legally responsible for code compliance in any jurisdiction throughout the country, their daily, practical focus is on interpreting the construction documents and technical specifications provided by the design team. In their world, they understand and are comfortable with the language of the construction documents. Who wouldn’t be more comfortable with project construction documents over the statewide code, plus the IBC building code, plus the hundreds of “adopted by reference” model codes and standards that fall beneath the building code umbrella? One can understand where they are coming from.

Contractors would like to see all of the building code requirements repeated in the construction documents; that would be appropriate and wonderful, but it is never going to happen because the specifiers are not capable of getting all of the “adopted by reference” IBC code verbiage into the construction documents either. The specifiers can list the various model codes and standards in their construction documents, but they cannot physically move hundreds of thousands of code acceptance criteria from the “adopted by reference code” therein.

While a contractor is legally responsible for code compliance under the building code and the project construction contracts they execute, their daily, practical focus is on interpreting the drawings and technical specifications provided by the design team. Regardless of their focus, it is vital that contractors be thoroughly conversant with building codes to ensure safety and compliance. If the contract documents themselves are incorrect or missing code requirements, a contractor who blindly follows them may still bear legal and financial liability for non-compliance. This is true because of the contracts that the contractor must sign before construction activity, most of which are going to require compliance with (practically) every building code in the land.

To be fair, other project team members play similar games regarding special inspections, but to a lesser degree. Special inspector agencies, architects, engineers, building officials, and project managers all have to find ways to deal with the complex, voluminous, and ambiguous technical data and language of the hundreds of model codes and standards that are “adopted by reference” by the IBC code and most statewide codes. Firms dealing with special inspections and project work on a regular basis should have at least one or more individuals in each discipline able to review code material. They should also be able to teach the code and code changes to employees who are involved with project special inspections on a regular basis.

Who is the best at understanding special inspections and the immensity of the code acceptance criteria required by the IBC code, the statewide code, and the “adopted by reference” model codes and standards? The answer to this question is the individual special inspector responsible for the individual project special inspection task, regardless of whether it involves structural steel welds or masonry. Structural engineers are impressive in this respect, too, and can exhibit vast knowledge of specific types of special inspections, especially on their own designed projects.





Another revelation that greatly impacts project special inspections and testing is ASTM designations. The American Society for Testing and Materials (ASTM) has authored more than 13,000 ASTM designations, and more than 300 ASTM designations have been “adopted by reference” by the IBC and most statewide codes. If the project special inspector is inspecting and testing fresh plastic concrete or masonry mortar in the field at the project, the building code will probably invoke between 75 and 100 of these “adopted by reference” ASTM standards.

These ASTM procedures not only instruct the special inspector on the numerous test methods to use in the field but also on what equipment to use, how to make calculations, and what information and data to include in the special inspection report. Most ASTM standards are written with mandatory language, meaning the special inspector must use all ASTM test methods at the project site and report all field and test data required by the ASTM test method. It is important to note that, oftentimes, the IBC code and the statewide code simply incorporate the ASTM designation by using the “adopted by reference” technique.

The special inspector agency and its employees must read, study, and research the ASTM designations to know what to do at the project site. The agency and its special inspectors must ensure that all tests are performed in accordance with the specific ASTM standards required for code and contract document compliance, with inspection and test results documented accordingly. While the special inspectors-in-training need to understand the importance and role of ASTM standards, they also need to know that they exist within the building code world, as the statewide codes and the IBC use the “adopted by reference” system.

Does the special inspector have to perform the duties described by the ASTM standard exactly as the ASTM standard specifies? Yes, if an ASTM standard designation is invoked by the building code for inspection, the special inspector or testing agency must comply with the applicable procedures, methods, and requirements specified within that ASTM standard. ASTM standards are replete with mandatory language, which offers the special inspector little to no opportunity to depart from their provisions. The agency must ensure all tests are performed in accordance with the specific ASTM standard required for compliance, with results documented accordingly. The special inspector must achieve mandatory adherence to the ASTM standard; this means that the special inspector must follow the precise procedures outlined in the designated ASTM standard to ensure the validity and accuracy of the inspection and test results, not to mention compliance with the provisions of the ASTM standard and the building code.

But wait! We have a lot more to say! For a complete picture of the Code and how it relates to Special Inspections, F&R would love to provide a virtual AIA-accredited Lunch & Learn presentation to the professionals at your firm.

Trouble Deciphering the Code? Call the Experts at F&R!

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