

CASE Guide to Special Inspections and Quality Assurance

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Part One

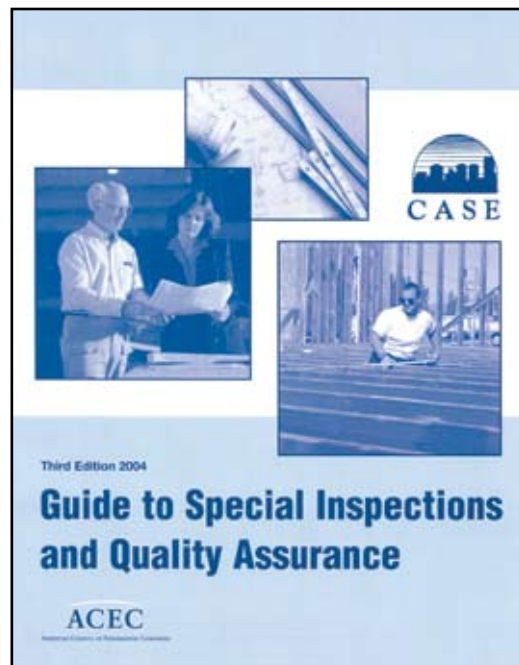
Special Inspections are inspections and tests of critical building components mandated by the Building Code. Code requirements for inspection and testing are not a new idea. Provisions for inspection of structural components were contained in the first edition of the *Uniform Building Code* (UBC) printed in 1927. The term "Special Inspections" first appeared in the 1961 edition of the UBC. The *National Building Code* (BOCA) first introduced Special Inspections requirements in 1988.

The *International Building Code* (IBC), first published in 2000, merged the UBC and BOCA Special Inspections provisions into Chapter 17. Since the UBC and BOCA codes had slightly different philosophies concerning inspection and testing, Chapter 17 of the IBC contains some inconsistencies.

The *NFPA Building Code* (NFPA 5000) also contains provisions for inspection and testing. NFPA chose to use the term "Quality Assurance" in lieu of "Special Inspections" to avoid confusion with the IBC provisions. The Quality Assurance requirements are contained in Chapter 40 of the NFPA 5000.

The authority to enforce the provisions contained in the Building Code rests with the local Building Official. Since a Building Official cannot be expected to be an expert in all of the technical building systems contained in a modern structure, Special Inspectors are needed who have a "special" expertise to inspect critical building components. The Special Inspector reports to the Building Official, but is engaged by the building owner.

Initially, Special Inspections requirements were limited to structural components and the emphasis was on structural safety. Often the Structural Engineer of Record (SER) would serve as the Special Inspector and perform many of the required inspections.



conduits. The SER is no longer the only design professional involved in the Special Inspections program. There is now a role for the Architect, Geotechnical Engineer, Mechanical Engineer, Electrical Engineer and other consultants.

When projects have been subjected to a well executed Special Inspections program with qualified inspectors, it has resulted in a dramatic improvement in the quality of the construction. Construction deficiencies have been identified and corrected before they could become costly or dangerous problems. This has been especially true when the SER has served as the Special Inspector.

A poorly executed Special Inspections program with unqualified or careless inspectors is worse than having no inspections at all. When inspection and testing reports are distributed indicating that all of the work is in compliance with the Contract Documents, team members are left with a false sense of security.

Preparing the Plan

The program of inspection and testing for a project should be prepared by the Registered Design Professional (RDP) that is in responsible charge of the building system requiring inspections and testing. The Structural Engineer of Record (SER) should determine what level of inspection and testing is required for the structural elements such as foundations, concrete, structural steel, etc.. The Architect and MEP engineer should prepare an inspection and testing program for the building systems that they are responsible for.

In some circumstances there may be more than one RDP responsible for different portions of the structural system. For instance, a pre-engineered metal building will often have a SER for the foundations and a different SER for the superstructure. Each SER would prepare an inspection and testing program for the portion of the structure that they are responsible for.

The inspection and testing program for soils and foundations such as controlled fill placement or deep foundations would usually be prepared by the SER. In some circumstances, the SER may delegate the inspection and testing program for these items to a geotechnical engineer.

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This philosophy has changed gradually. The 1996 BOCA code first introduced requirements for Special Inspection of non-structural building components. Spray fireproofing systems and Exterior Insulation and Finish Systems (EIFS) were added to the list of building components subject to Special Inspections. With the IBC code, this list has grown and now includes mechanical and electrical systems, such as smoke control systems and seismic restraint of emergency power

A *Statement of Special Inspections* (SSI) must be submitted to the Building Official (BO) along with the application for Building Permit. The SSI is a form that indicates what inspection and testing will be performed, what firms will perform them and what qualifications the individual inspectors and testing technicians should have.

Each RDP is responsible for preparing a SSI. This will result in multiple SSI forms being submitted to the Building Official. In some cases, the inspection and testing program for all of the disciplines may be merged into a single SSI.

In preparing the program, the RDP must use his judgment to determine the appropriate level of inspection and testing for the project. Complex projects will require more intense inspections than simple projects. The Building Code mandates a minimum level of inspection and testing. In addition to complying with code mandated requirements, the RDP will often require additional inspections or tests that are appropriate for the specific projects. These are referred to as discretionary inspections or tests.

The RDP must evaluate the credentials of the firms that will be engaged to perform the inspections and testing to confirm that they are qualified and that they do not have a conflict of interest. The RDP must also specify what specific qualifications or certifications the individual inspectors or testing technicians require.

Conflicts of Interest

It is still common practice in some areas for the Contractor to be required to hire an inspector and testing agency to perform special inspections and structural testing. This constitutes a conflict of interest.

It is a Building Code requirement that the inspectors and testing agencies be engaged by the Owner or the Owner's agent, and not



CASE Position Statement

The interests of the public, clients, and the AE community are best served when materials and workmanship critical to the structural integrity of structures are monitored through the Special Inspections process by the Structural Engineer of Record (SER). The extensive on-site presence of the SER through the Special Inspections process is the best means to protect the public, control claims and losses, and improve quality of the completed project.

The SER is the only member of the design team with the expertise and intimate knowledge of a particular building's Structural System and, therefore, is the best qualified to recognize and respond to site conditions that require the application of structural engineering judgment.

As the Special Inspector, the SER is able to communicate required corrections or Owner-directed changes before they are built into the structure, provide prompt responses to contractor's field questions, expedite corrective measures to address contractor errors, help build and maintain team communication and working relationships with the contractor, and minimize misinterpretation of the structural design intent.

The SER should serve as the Special Inspector wherever possible and practical. ■



by the Contractor. This clearly avoids a conflict of interest in most cases. There are some projects where the Owner is also the Contractor and a conflict of interest may be unavoidable.

Inspectors and testing agencies are required to disclose to the Building Official any potential conflicts of interest. Even if an inspector is hired directly by the Owner for a particular project, that same inspector could possibly be working for the project's Contractor on a different project. This could be a potential conflict of interest.

There is a misconception that it is a conflict of interest for the SER to serve as the Special Inspector. This is not true. The role of the Special Inspector is to verify that the construction is in compliance with the Construction Documents and this is consistent with the interest of the SER.

Conducting the Program

Prior to the start of construction, it is advisable to have a pre-construction conference to discuss the inspection and testing program and to make sure that all of the participants understand their roles and responsibilities.

The Contractor will schedule inspections and tests, and give ample advance notice to the Inspectors and Testing Agencies so that the work will not be delayed.

If a deficiency is identified during an inspection, or if a test fails, the Contractor should be immediately notified so that corrective steps can be taken promptly. It is not the role of the inspector to direct the Contractor as to what remedial work is required to correct a deficiency. That is the responsibility of the Registered Design Professional.

The Special Inspector collects and reviews the inspection and testing reports. The Special Inspector distributes Interim Reports to the Building Official and to the Registered Design Professional.

After all of the required inspections and tests have been performed, each Inspector and Testing Agency should submit an *Agent's Final Report of Special Inspections* to the Special Inspector. The Special Inspector should then submit a *Final Report of Special Inspections* certifying that all of the required inspections and tests have been completed and that all identified deficiencies have been corrected or resolved. ■

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