

## SPECIAL INSPECTION – AN OVERVIEW

The International Building Code (IBC) has set forth a number of stipulations in which the employment of special inspectors is mandatory. In the first edition of the IBC, the owner or the registered design professional in responsible charge acting as the owner's agent is required to provide specially qualified inspectors for continuous or periodic inspections during construction (IBC Sec. 1705.1). These inspections are in addition to the inspections specified in IBC section 109. Exceptions to special inspection are noted also.

A special inspector is a person who has been approved by the building official to perform certain types of inspection as detailed in IBC section 1704. These generally include:

- A. Inspection of fabricators:** Where fabrication of structural load-bearing members and assemblies are being performed on the premises of the fabricator. Note exception for approved fabricators. See Section 1704.2.
- B. Steel construction:** See Table 1705.2 for detailed information regarding inspections. Major areas under steel construction are:
  - 1. material verification of high-strength bolts, nuts, and washers;
  - 2. inspection of high-strength bolting,
  - 3. material verification of structural steel,
  - 4. material verification of weld filter materials,
  - 5. inspection of welding for both structural steel and reinforcing steel, and,
  - 6. inspection of steel frame joint details for compliance with approved construction documents.
- C. Concrete construction:** See Table 1705.3 for detailed information regarding inspection. Major areas under steel construction are:
  - 1. inspection of reinforcing steel, including prestressing tendons, and placement,
  - 2. inspection of bolts to be installed in concrete prior to and during placement of concrete,
  - 3. verification of use required design mix,
  - 4. sampling of fresh concrete and performing slump, air content and fresh concrete temperature at time of making specimens for strength tests,
  - 5. inspection of concrete and shotcrete placement for proper application techniques,
  - 6. inspection for maintenance of specified curing temperature and techniques,
  - 7. inspection of prestressed concrete including application of prestressing forces and grouting of bonded prestressing tendons,
  - 8. erection of precast concrete members,
  - 9. verification 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.
- D. Masonry construction:** See IBC Tables 1604.5 and 1617.6 for classification of building or structure requiring special inspection. Tables 1705.4 show detailed information regarding level 1 and level 2 special inspections for masonry construction. Major areas under masonry construction are:
  - 1. verification of site-prepared mortar, construction of mortar joints, and locations of reinforcement and connectors,
  - 2. verification of size and location of structural elements; type, size, and location of anchors; including details of anchorage of masonry to structural members, frames, or other construction,
  - 3. verification of specified size, grade, and type of reinforcement,
  - 4. verification of welding of reinforcing bars,
  - 5. verification of protection of masonry during hot and cold weather,
  - 6. verification prior to grouting that the grout space is clean and correct proportions of site-prepared grout are present,
  - 7. preparation of any grout specimens, mortar specimens, and/or prisms,
  - 8. verification of compliance with required inspection provisions of the construction documents and the approved submittals.
- E. Wood construction:** Inspection of the fabrication of wood structural elements and assemblies. See Section 1705.5.
- F. Soils:** Inspection of site preparation prior to placement of prepared fill, verification of fill materials and maximum lift thickness, and verification that in-place densities meet soils report. See Section 1705.6.
- G. Pile foundations:** Inspection of installation and testing of pile foundations, and recording of installation, load test, and cutoff and tip elevation of each pile. See Section 1705.9.
- H. Pier foundations:** Inspection of pier foundations in accordance with Section 1616.3 for buildings located

in Seismic Design Categories C, D, E, or F. See Section 1705.8.

- I. Wall panels and veneers:** Inspection of exterior and interior architectural wall panels and the anchoring of veneers for building assigned to Seismic Design Categories E and F. Inspections of veneers shall meet requirements of Section 1704.5. See Section 1704.10
- J. Sprayed fire-resistant materials:** Inspection of fire-resistant material applied to structural elements and decks in accordance with Section 1705.14.
- K. Exterior insulation and finish systems (EIFS):** See Section 1705.16 for exceptions to required inspections.
- L. Special cases:** Inspections that, in the opinion of the building official, are needed because of the use of alternate materials, unusual design, or use of materials not having building code approval that are necessary to meet special manufacturer requirements. See Section 1705.1.1
- M. Smoke control:** See Section 1705.18.

### GENERAL PROGRAM GUIDELINES

- A. Purpose of 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 that the contractors and their employees to assure that the approved plans and specifications are being followed and that relevant codes and ordinances are being observed. The special inspection process is in addition to those inspections conducted by the municipal building inspector and by the engineer or architect of record as part of periodic structural observation. The special inspectors furnish continuous or periodic inspection as prescribed in IBC 1704 for that construction which requires their presence. Good communication between the special inspector and the designers, contractor, and building department is essential to project quality assurance.
- B. Duties and Responsibilities of the Special Inspector:** Though not required by code, special inspectors and/or inspection agencies can document acceptance of their responsibilities and scope of work for a project by signing an agreement that includes a detailed schedule of services, commonly known as the Special-Inspection and Testing Agreement and the Special-Inspection and Testing Schedule. Duties of special inspectors and/or inspection agencies include the following:
  - 1. Signify presence at job site.** Special inspectors should notify contractor personnel of their presence and responsibilities at the job site. If required by the building official, they shall sign in on the appropriate form posted with the building permit.
  - 2. Observe assigned work.** [IBC Section 1704] Special inspectors shall inspect all work for which they are responsible for conformance with the building department approved (stamped) plans and specifications and applicable provisions of the IBC.
  - 3. Signify presence at job site.** Special inspectors should notify contractor personnel of their presence and responsibilities at the job site. If required by the building official, they shall sign in on the appropriate form posted with the building permit.
  - 4. Provide timely reports.** The special inspector should complete written inspection reports for each inspection visit and provide the reports on a timely basis determined by the building official. The special inspector or inspection agency shall furnish these reports directly to the building official, engineer, or architect of record, and others as designated. [IBC Section 1704.1.2] These reports should be organized on a daily and weekly format and may be submitted weekly at the option of the building official. In these reports, special inspectors should include:
    - a.** Describe inspections 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 engineer or architect of record if not included in the nonconforming items.
  - 5. Submit final report.** Special inspectors or inspection agencies shall submit a final signed report to the building department stating that all items requiring special inspection and testing were fulfilled and reported, and to the best of their knowledge, in conformance with the approved plans, specifications, and the applicable provisions of the IBC. [IBC Section 1704.1.2] 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.
- C. Duties and Responsibilities of the Project Owner:** The project owner, the engineer, architect of record, or an agent of the owner is responsible for funding special inspections services. The special

inspector\agency shall not be in the employ of the contractor, subcontractor, or material supplier. [IBC Section 106.3.5] In the case of an owner\contractor, the special inspector\agency shall be employed as specified by the building official.

- D. Duties and Responsibilities of the Design Professional in Responsible Charge:** The design professional in responsible charge should be a consenting party by written acknowledgement of special inspection and testing agreements. The design professional in responsible charge has many duties and responsibilities related to special inspection, including the following:

- 1. Prepare special inspection program.** The design professional in responsible charge shall list the items for which special inspection is required; and shall indicate any items for which the IBC or the building official approves periodic inspection and the frequency of such inspection. The design professional in responsible charge should coordinate with the project owner in the selection of special inspectors [IBC Section 1704.1] and is required to list special inspectors and their duties on the special inspection program. The standard of the industry for employing a qualified inspection agency is its compliance with the requirements of ASTM E-329. The choice of special inspector should include the following considerations:
  - a. Project size and complexity: experience with similar projects
  - b. Inspection staffing: sufficient qualified inspectors
  - c. Site location: proximity of inspection and testing facilities
  - d. Off-site inspection: capabilities for inspecting at remote locations

- E. Duties and Responsibilities of the Contractor:** The contractor's duties include the following:

- 1. Notify the special inspector.** The holder of the building permit or their duly authorized agent is responsible for notifying the special inspector or agency regarding individual inspections as required by the building department. [IBC Section 109.5] Adequate notice shall be provided so that the special inspector has time to become familiar with the project.
- 2. Provide access to approved plans.** The contractor is responsible for providing the special inspector access to approved plans. [IBC Section 106.3.1]
- 3. Retain special inspection records.** When required by the building official, the contractor is responsible for retaining, at the job site, all special inspection records submitted by the special inspector, and providing them for review to the building department's inspector upon request.

- F. Duties and responsibilities of the Building Official:** Of all the team members involved in the construction process, the building official is the only one with the legal authority to enforce the special inspection provisions of the code. [IBC Section 104.4] The employment of a special inspector or agency shall not relieve the building department of responsibility for progress or called inspections as required by the code. Building department inspections of items also requiring special inspection should not be signed off without the concurrence of the special inspector.

The specific duties and responsibilities of the building official relating to the special inspection include the following:

- 1. Review submittal documents for compliance with special inspection requirements.** The building official is charged with the legal authority to review the plans, specifications, special inspection program, and other submittal documents for the compliance with code requirements. [IBC Section 104.2, 106.3, 106.5]
- 2. Approve special inspection program.** The building official is responsible for approving the special inspection program submitted by the design professional in responsible charge [IBC Section 1704.1] and may require a preconstruction conference to review the program with all appropriate members of the construction team.
- 3. Approve special inspectors/inspection agencies.** The building official is responsible for determining the competence of special inspectors for the types of work they will be inspecting. [IBC Section 1704]
- 4. Monitor special inspection activities.** The building official should monitor the special inspection activities at the job site to assure that qualified special inspectors are performing their duties when work requiring special inspection is in progress.
- 5. Review inspection reports.** The building official receives and reviews special inspection progress reports and final reports for conformance with the approved plans, specifications, and workmanship provisions of the code. [IBC Section 1704.1.2]
- 6. Perform special inspection.** The building official should not perform the final inspection and

approval of a project [IBC Section 109.3.10] until the final special inspection report has been reviewed and approved.

The use of special inspectors is not discretionary. IBC Section 1704 clearly states the conditions under which they must be utilized, but there is a provision for the building official to waive the special inspection for work of a minor nature.

It is the responsibility of the building official to determine the competency of special inspectors. The IBC does not make specific requirements for the determination of an inspector's qualifications, but that in no way lessens the importance of being selective in this crucial process.

A qualified special inspector usually has skills that are significantly more specialized than those of regular municipal inspectors. A municipal inspector is required to have a general knowledge of a great number of code requirements, whereas special inspectors focus on limited areas of structural inspection and materials testing.

- G. Duties and Responsibilities of the approved fabricator** Special inspections required by this code are not required where work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approved shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.