

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PLANNING & BUILDING

SPECIAL INSPECTION PROGRAM

Based on the 2019 California Building Code (CBC) Chapter 17
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SECTION 1. SPECIAL INSPECTION – AN OVERVIEW

There are several areas of construction regulated by the California Building Code (CBC) where special inspection is mandatory. These inspections are to verify that work that is considered critical to life safety and property protection is being or has been constructed according to the approved plans and specifications. These special inspections are in addition to the typical municipal inspections required by the building department that are specified in Section 110 or specific structural observation that may be required by Section 1704.5. Section 1704 details when special inspection is required and for what types of work. The registered design professional in responsible charge is required to prepare a "Statement Of Required Special Inspections" that outlines the special inspections to be performed specifically to the project.

Special inspection is the monitoring of materials, installation, fabrication, erection and placement of components and connections that require special expertise that are critical to the integrity of the building structure. Special inspection is required to ensure compliance with the approved construction documents (plans) and standards referenced in the applicable codes. Special inspectors or special inspection agencies must be approved by the building official to conduct certain types of inspections as detailed in Section 1704. Although Section 1704.1 requires the owner or the registered design professional acting as the owner's agent to provide for specially qualified inspectors, the approval of special inspectors and special inspection agencies is solely the responsibility of the building official.

Special inspection requirements in the 2016 CBC are comprehensive and consist of 16 major categories as follows:

- 1. Inspection of fabricators.** Required where fabrication of structural load-bearing members and assemblies is being performed on the premises of the fabricator. Note the exception for approved fabricators in Section 1704.2.5.
- 2. Steel construction.** Steel elements of buildings and structures requiring special inspection are found in Section 1705.2. Note the exception in Section 1705.2 discussing steel fabrication without heating operations of any kind. See Table 1705.2.2 for detailed information regarding inspections and referenced standards. Specific areas listed in Table 1705.2.2 for steel construction other than structural steel are:
 - Material verification of cold-formed steel deck.
 - Inspection of welding for cold-formed steel deck and reinforcing steel.
- 3. Concrete construction.** The special inspection and verification requirements for concrete construction are found in Section 1705.3. See Table 1705.3 for detailed information regarding inspections. Specific areas listed in Section 1705.3 for concrete construction are:
 - Reinforcing steel, including prestressing tendons and placement.
 - Reinforcing steel welding.
 - Anchors cast in concrete.

- Anchors post-installed in hardened concrete members.
 - Verifying use of required design mix.
 - Sampling fresh concrete, and performing slump, air content and fresh concrete temperature at time of making specimens for strength tests.
 - Proper application techniques for concrete and shotcrete placement.
 - Maintaining specified curing temperature and techniques.
 - Prestressed concrete, including application of prestressing forces and grouting of bonded prestressing tendons.
 - Erecting precast concrete members.
 - Verifying in-situ concrete strength prior to stressing of tendons in post-tensioned concrete, and prior to the removal of shores and forms from beams and structural slabs.
 - Formwork for shape, location and dimensions of concrete members.
- 4. Masonry construction.** The special inspection and verification requirements for masonry construction are found in Sections 1705.4 and 1705.4.2. Masonry construction shall be inspected and verified in accordance with TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6 quality assurance program requirements.
- 5. Wood construction.** Inspection of the fabrication of wood structural elements and assemblies for high-load diaphragms, both prefabricated and field assembled, or site built, are found in Section 1705.5. Special inspections of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5. Special inspections of site-built assemblies shall be in accordance with Section 1705.5. Note the exception for approved fabricators in Section 1704.2.5.1.
- 6. Soils.** Inspection of site for existing conditions, verification of site preparation prior to placement of prepared fill, verification of fill material and maximum lift thicknesses, and verification that in-place densities meet the requirements of the approved soils report (see Section 1705.6 and Table 1705.6). Note the exception in this section pertaining to moisture content.
- 7. Driven deep, cast-in-place and helical pile foundations.** Inspections performed during the installation and testing of pile foundations (see Tables 1705.7 and 1705.8; and Sections 1705.7, 1705.8 and 1705.9).
- 8. Special inspection for wind resistance.** Special inspections itemized in Sections 1705.10.1 through 1705.10.3 are required for buildings and structures constructed in certain wind exposure categories.
- a. Structural wood.** Continuous inspection of field gluing operations of the main wind force resisting system is required. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components (see Section 1705.10.1). Note the exception for components of the main wind force resisting system where fastener spacing of the sheathing is greater than 4 inches (102 mm) on center.
 - b. Cold-formed steel light-frame construction.** Periodic inspection is required

during welding operations of elements, and for screw attachment, bolting, anchoring and other fastening of components within the main wind force resisting system. See Section 1705.10.2 and note the two exceptions as applicable.

- 9. Special inspection for seismic resistance.** Section 1705.11 requires inspections listed in Sections 1705.11.1 through 1705.11.8, unless exempted by the exceptions of Section 1704.2.
 - a. Designated seismic systems.** Section 1705.11.4 requires the special inspector to examine designated seismic systems that require qualification in accordance with Section 1705.12.3 to verify that the anchorage or mounting conforms to the certificate of compliance.
 - b. Architectural components.** Periodic special inspection is required during the erection and fastening of exterior cladding, interior and exterior nonbearing walls, and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F. See Section 1705.11.5 and note the three exceptions.
 - c. Access floors.** Section 1705.11.5.1 requires periodic special inspection for the anchorage of access floors in structures assigned to Seismic Design Category D, E or F.
 - d. Mechanical and electrical components.** Section 1705.11.6 contains requirements for periodic special inspection for mechanical and/or electrical equipment for installations in various seismic design categories.
 - e. Storage racks.** Periodic special inspection is required for the anchorage of storage racks 8 feet (2438 mm) or greater in height in structures assigned to Seismic Design Category D, E or F. See Section 1705.11.7.
 - f. Seismic isolation systems.** Section 1705.11.8 requires special inspection during the fabrication and installation of isolator units and energy dissipation devices for seismic isolation systems.
- 10. Testing and qualification for seismic resistance.** Testing and qualification, as specified in Sections 1705.12.1 through 1705.12.4, is required, unless exempted from special inspection by the exceptions of Section 1704.2.
 - a. Concrete reinforcement.** The section contains special requirements for reinforcement complying with ASTM A 615 used to resist earthquake-induced flexural and axial forces. Section 1705.12.1 requires compliance with specific sections of ACI 318 and weldability tests to comply with Section 3.5.2 of ACI 318.
 - b. Structural steel.** Testing of structural steel shall be conducted in accordance with the quality assurance requirements of AISC 341. Section 1705.12.2 notes an exception for structural steel in structures assigned to Seismic Design Category C.
 - c. Seismic certification of nonstructural components.** Section 1705.12.3 requires the registered design professional to specify certifications of nonstructural

components and designated seismic systems for compliance with Section 13.2 of ASCE 7 where certification is required by Section 1705.12.

11. Sprayed fire-resistant materials. Special inspection of fire-resistant material applied to structural elements and decks in accordance with Sections 1705.13.1 through 1705.13.6. These sections refer to specific elements and components of construction and provide minimum requirements for in-situ testing. Inspection of sprayed fire-resistant materials is as follows:

- Verification of structural member surface conditions
- Verification of the application of materials in accordance with the manufacturer's instructions
- Verification of the thicknesses and density of applied materials
- Verification of the bond strength of applied materials

12. Mastic and intumescent fire-resistant coatings. Inspection of mastic and intumescent fire-resistant coatings for structural elements and decks is required in accordance with Section 1705.14.

13. Exterior insulation and finish systems (EIFS). See Section 1705.15 for exceptions to inspection when EIFS is applied over water-resistive barriers with a means for draining excess water, and EIFS installed on masonry or concrete.

14. Fire-resistant penetrations and joints. Section 1705.16 covers special inspection of through penetrations, membrane-penetration firestops, fire-resistant joint systems and perimeter fire barrier systems. These materials are required to be tested and listed in accordance with Sections 714.3.1.2, 714.4.1.2, 715.3 and 715.4. See Sections 1705.16.1 and 1705.16.2 for additional special inspection requirements.

15. Special inspection for smoke control. Section 1705.17 requires the testing of smoke control systems by a special inspector. Special inspection agencies must have expertise in fire protection engineering and mechanical engineering, as well as certification as air balancers per Section 1705.17.2.

16. Special cases. Inspections, in the opinion of the building official, that are needed because of the use of alternative materials, unusual design or use of materials not having building code approval or needing to meet special manufacturer requirements are authorized in Section 1705.1.1.

SECTION 2. 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 the 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 ordinances are being observed. The special inspection process is in addition to those conducted by the authority having jurisdiction building inspector and by the registered design professional in responsible charge as part of periodic structural observation. Special inspectors furnish continuous or periodic inspection as prescribed in CBC Tables 1705.2.3, 1705.3, 1705.6, 1705.7, and 1705.8 for construction which requires their presence. See also CBC Sections 110 and 1704.

Good communication between the special inspector and the designers, contractor and building department is essential to project quality assurance. The following sections, B through F, are a combination of building code requirements and the results of years of lessons learned related to special inspection work that have resulted in the successful completion of buildings.

B. Duties and Responsibilities of the Special Inspector

The CBC requires that a "Statement of Required Special Inspections" be submitted with the application of the permit. The special inspector should know and understand the scope of the statement prior to beginning special inspections (see the duties of the design professional in responsible charge).

Though not required by the CBC, the County of San Luis Obispo Building Division requires that special inspectors and/or inspection agencies 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 Statement Of Required Special Inspection Agreement and the Statement of Required Special Inspections. See required forms BLD-1031 and BLD-1032. Duties of special inspectors and/or inspection agencies include the following:

- 1. General requirements.** Special inspectors shall review approved plans and specifications for special inspection requirements. Special inspectors will comply with the special inspection requirements of the enforcing jurisdiction found in the Statement of Special Inspections, including work and materials.
- 2. Signify presence at jobsite.** Special inspectors shall notify contractor personnel of their presence and responsibilities at the jobsite. If required by the building official, they shall sign in on the appropriate form. Currently typical job presence dialog between special inspectors and contractors is acceptable. The building Official need not be notified but the special inspector shall be approved for the discipline and to work in the jurisdiction for the calendar year as approved by the building official.

3. Observe assigned work. Special inspectors shall inspect all work according to the Statement Of Required Special Inspections for which they are responsible to determine compliance with the building division approved (stamped) plans and specifications, and the applicable provisions of Section 1704. No work shall be performed without the approval and permits from the building official.

4. Report nonconforming items (discrepancies). Special inspectors shall bring all nonconforming items to the immediate attention of the contractor. If any such item is not resolved in a timely manner or is about to be incorporated into the work, the registered design professional in responsible charge and the building official should be notified immediately and the item noted in the special inspector's written report (see Section 1704.2.4). The building official may require this report to be posted in a conspicuous place on the job site. See Special Inspection Discrepancy Notice BDG-1034. The special inspector or inspection agency may use their own form, but all the information on form BLD-1034 is required to be on the forms used. The special inspector shall prepare a separate report to be posted at the jobsite regarding noted discrepancies and shall contain the following information about each nonconforming item:

- Description and exact location
- Reference to applicable detail of approved plans/specifications
- Name and title of each individual notified and method of notification
- Resolution or corrective action taken

5. Provide timely reports. The special inspector shall complete written inspection reports for each inspection visit and shall provide the reports on a timely basis as determined by the building official. The time frame for submission of reports shall be discussed at a required preconstruction meeting and shall be adhered to for the duration of the project. The special inspector or inspection agency shall furnish these reports directly to the building official, registered design professional in responsible charge and others as designated (see Section 1704.2.4). These reports should be organized on a daily format and may be submitted weekly at the option of the building official. Forms BLD-1033 and BLD-1034 are provided in this program for ease of use and identifying the minimum information required by the building official. The special inspector or inspection agency may use their own forms, but all the information on forms BLD-1033 and BLD-1034 is required to be on the forms used. Special inspectors shall:

- Describe inspections and tests made at applicable locations and whether the work meets the requirements of the Statement of Special Inspections
- Indicate nonconforming items (discrepancies) and how they were resolved
- List unresolved items, parties notified, and time and method of notification
- Itemize changes authorized by registered design professional in responsible charge if not included in nonconforming items

6. Submit final report. Special inspectors or inspection agencies shall submit a final signed report to the building division stating that all items requiring special inspection and

testing by the Statement Of Required Special Inspections were fulfilled and reported; and, to the best of their knowledge, all items are in conformance with the approved plans and specifications (see Section 1704.2.4). Items not in conformance, unresolved items or any discrepancies in inspection coverage (i.e., missed inspections, periodic inspection when continuous was required, etc.) should be specifically itemized in this report and stamped by the specified special inspection licensed professional. Form BLD-1035 is provided in this program for ease of use and identifying the minimum information required by the building official. The special inspector or inspection agency may use their own form, but all the information on form BLD-1035 is required to be on the forms used.

C. Duties and Responsibilities of the Project Owner

The project owner, the registered design professional in responsible charge, or an agent of the owner is responsible for funding special inspection services. Measures should be taken to ensure that the scope of work and duties of the special inspector as outlined in the Statement of Special Inspections are not compromised. The special inspector/agency shall not be in the employ of the contractor, subcontractor or material supplier (see Section 1704.2). In the case of an owner/contractor, the special inspector/agency shall be employed as determined by the building official.

D. Duties and Responsibilities of the Design Professional in Responsible Charge

The design professional in responsible charge shall be a consenting party by written acknowledgment of the Statement Of Required Special Inspections Agreement. See the required "Statement Of Special Inspection Agreement" (BLD-1031).

The design professional in responsible charge shall prepare a "Statement Of Required Special Inspections" (BLD-1032) specific to the project to be submitted with the permit application (see Sections 107.1, 110.3.9 and 1704.2.3) by imprinting the "Statement Of Required Special Inspections" (BLD-1032) on a sheet of the plan set. Section 1704.3.1 requires the statement to contain the following information:

- Materials, systems components and work required to have special inspection
- Duties of the registered design professional responsible for each part
- Type and extent of each special inspection
- Type and extent of each test
- Special inspection and testing of required seismic-resistance systems and components (see Sections 1705.11 and 1705.12)
- Special inspection of required wind-resistance systems and components (see Section 1704.10)
- Identification of whether each special inspection is continuous or periodic

Completion of a "Statement Of Required Special Inspections Agreement" (BLD-1031) and "Statement Of Required Special Inspection" (BLD-1032) are the required methods of

fulfilling the requirements of the San Luis Obispo County Special Inspection Program that can be easily reviewed by the building official.

For revisions to approved plans, the design professional in responsible charge shall acknowledge and approve shop drawings that may detail structural information. The design professional shall submit to the building official and the special inspector or inspection agency written approval of any verbally approved deviations from the approved plans and shall submit revised plans for building official approval (see Sections 107.3.4.1 and 107.4).

E. Duties and Responsibilities of the Contractor

Each contractor responsible for construction of the structural systems described in Section 1704.4 shall submit a written statement of responsibility to the building official and the owner prior to commencement of the work on the system or component. The contractor's acknowledgement of the Statement Of Required Special Inspections Agreement (BLD-1031) shall satisfy this requirement and the following:

1. Acknowledgement of awareness of the special requirements contained in the Statement of Special Inspections
2. Acknowledgement that control will be exercised to obtain compliance with the construction documents approved by the building official
3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports
4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization

During the course of construction, the contractor shall:

1. Provide adequate notice 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 with access to approved plans per Section 107.3.1
3. Provide all special inspection records submitted by the special inspector at the job site for review by 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 (see Section 104.4). The employment of a special inspector or agency shall not relieve the building department of responsibility for inspections or structural observations as required by the codes. Building division inspections of items also requiring special inspection shall not be signed off without the concurrence of the special inspector.

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

- 1.** Review submittal documents for compliance with the special inspection requirements. The building official is charged with the legal authority to review plans, specifications pertaining to work and materials, the Special Inspection Program, and other submittal documents for compliance with code requirements per Sections 104.2 and 107. Approval for materials should be in accordance with Sections 104.9 and 104.11.
- 2.** Approve fabricator(s) used for building components installed on-site.
- 3.** Approve the Special Inspection Program submitted by the design professional in responsible charge and may require a preconstruction conference to review the program with all applicable members of the construction team.
- 4.** 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 per Section 1704. Qualifications for special inspectors are contained in Section 3 of this guide.
- 5.** Monitor special inspection activities at the job site to ensure that qualified special inspectors are performing their duties when work requiring special inspection is in progress (see Section 1704.2.4).
- 6.** Issuance of stop work orders. The building official is recognized as having the authority to stop work at the job site (see Section 115); however, the special inspector does not have this authority. Stop work orders may be issued in response to a discrepancy report that has been written by the special inspector.
- 7.** Approval to proceed. There are certain points of completion where work shall not proceed until approval by the building official has been given.
- 8.** Review inspection reports and authorize final inspection approval. The building official receives and reviews special inspection progress reports and final reports for compliance with the approved plans, specifications and workmanship provisions of the code (see Section 1704.2.4). The building official will not perform the final inspection and issue certificate of occupancy for a project until the final special inspection report has been reviewed and approved.

SECTION 3. SPECIAL INSPECTOR QUALIFICATIONS

A. Code Knowledge and Plan Reading Competency Standards

The building official has the responsibility to ascertain that special inspectors and/or agencies are qualified for the type(s) of inspection required. In some categories, cooperative jurisdictional programs for the recognition of competent inspectors/agencies may assist in satisfying this requirement.

Qualification standards may include:

1. Individuals maintaining current certification by ICC as a special inspector for the discipline(s) for which he or she is requesting approval. All welding Inspectors shall be an AWS Certified Welding Inspector (CWI). An ICC Welding Certification will not be accepted as the sole welding certification but may be in addition to CWI.
2. Agencies maintaining current accreditation as a special inspection agency by IAS with a scope of accreditation covering the discipline(s) for which the agency is requesting approval. See Appendix B for IAS required minimum qualifications for special inspection.

B. Experience Standards

The specialized knowledge and skills needed to perform special inspection should be obtained by experience in some aspect of the discipline being inspected. Industry standards typically require 1–5 year(s) of verifiable practical experience, depending upon the discipline and the level of inspection. A portion of the experience factor may be satisfied by applicable technical education. There are also provisions for trainees who may work under the direct supervision of qualified special inspectors.

Detailed guidelines for special inspector experience standards are contained in Appendix B. The building official may require that special inspector applicants provide evidence of experience through the following and/or other means:

1. Written references verifying related work experience
2. Personal interview to evaluate the applicant's work experience and suitability to be a special inspector.
3. Evidence of compliance with a recognized industry experience guideline (see example in Appendix B)

C. Performance Standards

Appendix A contains comprehensive tasks, which may be performed by special inspectors on large and complex projects. Actual tasks required on specific projects will typically be fewer.

D. Requirements For Building Official Approval

A firm or individual seeking approval as a special inspector for projects in the County of San Luis Obispo shall submit the following to the building official, electronic preferred:

1. A letter from the firm or individual on what disciplines are sought for approval
2. Copy of a valid photo identification
3. A resume with a work history and experience
4. An organizational chart from responsible licensed professional and down
5. A copy of all current certifications
6. For firms a spread sheet of all certified personnel and their certifications for quick reference guide

E. Agency Accreditation

The building official may utilize any reasonable criteria for approval of a special inspection agency. An agency may submit required information to the building official as requested to determine suitability for the special inspection tasks to be undertaken. As an alternate, the agency may consider the International Accreditation Service (IAS) Special Inspection Agency Accreditation Program. The program requires special inspection agencies to operate under a quality management system that is documented in a manual, and also requires the agency to be assessed in the field to determine if it is competent to perform specific inspections or types of inspections. IAS accreditation is based on the assessment of a special inspection agency's inspection procedures, the competence of its inspection staff, and its reporting procedures.

APPENDIX A. JOB TASK LISTS FOR SPECIAL INSPECTORS

These task lists are representative of the tasks tested in the ICC certification exams and are found in the 2018 National Certification Exam Information Bulletin at <https://cdn-web.iccsafe.org/wp-content/uploads/CO-National.pdf>

The job task lists are developed by the exam development committee specifically assigned to each exam. The tasks describe the work performed by special inspectors as it is practiced in the field. Other tasks related to this work may be helpful or extend the professional ability of the inspector; however, these tasks are the minimum required to protect the public health and safety. Minimum requirements for certification exams are mandated by the Equal Employment Opportunity Commission (EEOC) and accepted professional certification standards as developed by the American Psychological Association (APA), Council on Licensure, Enforcement and Regulation (CLEAR), and National Organization of Competency Assurance (NOCA).

A. Special Inspection of Reinforced Concrete

1. General Requirements

Review approved plans and specifications for special inspection requirements. Comply with special inspection requirements of the enforcing jurisdiction. Notify the contractor of deviations from approved plans and specifications. If the deviations are uncorrected, notify the registered design professional in responsible charge and the building official. Submit progress reports to the registered design professional in responsible charge and the building official, describing tests that were performed and compliance of work. Submit final summary report stating whether work requiring special inspection was in conformance with the approved plans and applicable provisions of the building code.

2. Concrete Quality

Verify that individual batch tickets indicate delivery of the approved mix as specified. Verify time limits of mixing, total water added, and proper consistency and workability for placement.

Determine the required type, quantity and frequency of tests to be performed on fresh and hardened concrete. Observe sampling of concrete, field testing of fresh concrete and making of test specimens. Provide or arrange for proper specimen identification, site storage and protection, and transportation to the testing laboratory. Provide or arrange for communication of field-testing results to the registered design professional in responsible charge and to the building official.

3. Reinforcement

Verify that reinforcing steels are of the type, grade, and size specified and are in conformance with acceptable quality standards. Ensure that reinforcing steel is free of oil, dirt and rust and that steel is properly coated and/or sheathed as specified. Verify that reinforcing steels are located within acceptable tolerances and are adequately supported and secured to prevent displacement during concrete placement. Verify that

minimum concrete cover is provided. Verify that placement of reinforcing steel (or ducts) complies with required spacing, profile and quantity requirements, as indicated by both the approved plans and installation drawings. Verify that hooks, bends, ties, stirrups and supplemental reinforcement are fabricated and placed as specified. Verify that required lap lengths, stagger and offsets are provided. Verify proper installation of approved mechanical connections per the manufacturer's instructions and/or evaluation reports. Insure that all welds of reinforcing steel and other welding are as specified and have been inspected and approved by an approved welding inspector.

4. Formwork, Joints and Embeds

Verify that formwork will provide concrete elements of the specified size and shape. Verify that the location and preparation of construction joints are in accordance with the approved plans, specifications and building code requirements. Verify that the type, quantity, size, spacing and location of embedded items are as specified.

5. Concrete Placement, Protection and Curing

Verify acceptable condition of the place of deposit before the concrete is placed. Verify that methods of conveying and depositing concrete avoid contamination and segregation of the mix. Verify that concrete is being properly consolidated during placement. Verify that concrete is protected from temperature extremes, and determine that proper curing is initiated.

B. Special Inspection of Prestressed Concrete

Note: Certification as a Reinforced Concrete Special Inspector is required before certification as a Prestressed Concrete Special Inspector. All items listed under "Reinforced Concrete Special Inspector" are considered prerequisite to the knowledge for special inspection of prestressed concrete.

1. General Requirements

Comply with special inspection requirements of the enforcing jurisdiction. Review approved plans and specifications for project details that pertain to special inspection requirements. Notify the contractor of deviations from approved plans and specifications. If the deviations are uncorrected, notify the registered design professional in responsible charge and the building official. Submit progress reports to the registered design professional in responsible charge and the building official, describing tests that were performed and compliance of work. Submit final summary report stating whether work requiring special inspection was in conformance with the approved construction documents and applicable provisions of the building code.

2. Concrete Quality

Verify that individual batch tickets indicate delivery of the approved mix as specified. Verify time limits of mixing, total water added, and proper consistency and workability for placement.

Determine the required type, quantity and frequency of tests to be performed on fresh and hardened concrete. Observe sampling of concrete, field testing of fresh concrete and making of test specimens. Provide or arrange for proper specimen identification, site storage and protection, and transportation to the testing laboratory. Provide or arrange for communication of field testing results to the registered design professional in responsible charge and to the building official.

3. Reinforcement

Verify that reinforcing steel and tendons are of the type, grade and size specified and are in conformance with acceptable quality standards. Verify that the reinforcing steel and tendon system are fabricated in conformance with acceptable quality standards. Verify that the tendons at the time of concrete placement are free of oil, dirt and excessive rust, and are properly coated and/or sheathed as specified. Verify that reinforcing steel and tendons are located within specified tolerances and are adequately supported and secured to prevent displacement during concrete placement. Verify that minimum concrete cover is provided. Verify that placement of reinforcing steel and tendons (or ducts) comply with spacing, profile and quantity requirements, as indicated by the installation drawings and approved plans. Verify that hooks, bends, ties, stirrups and supplemental reinforcement are fabricated and placed as specified. Verify that required lap lengths, stagger and offsets are provided. Verify proper installation of approved mechanical connections per the manufacturer's instructions and/or evaluation reports. Verify that welds have been inspected and approved as specified. Verify that prestressed rock and soil anchors are fabricated and installed as specified.

4. Prestressing and Grouting

Verify that the required concrete strength has been attained prior to transferring prestressing forces. Verify proper equipment calibration. Verify that proper stressing (or tensioning) sequences are used, proper jacking forces are applied, and acceptable elongations are attained and recorded. Verify that tendons and anchorages are properly sealed or otherwise protected as specified. Verify that ducts including inlets and outlets are of the required size, are mortar-tight and are located correctly. Verify that proper grout materials, strength and grouting pressures are used as specified.

5. Formwork, Joints and Embedments

Verify that formwork will provide concrete elements of the specified size and shape. Verify that the location and preparation of construction joints are in accordance with the approved plans, specifications, and applicable codes and standards. Verify that the type, quantity, size, spacing, condition and location of embedded items are as specified.

6. Concrete Placement, Protection and Curing

Verify acceptable condition of the place of deposit before the concrete is placed. Verify that methods of conveying and depositing concrete avoid contamination, segregation of the mix, and displacement of reinforcement, embedments, and forms. Verify that concrete is being properly consolidated during placement. Verify that concrete is

protected from ambient temperature extremes during placement and curing. Verify that concrete is being cured as specified by approved plans, specifications and applicable codes.

C. Special Inspection of Structural Masonry

1. General Requirements

Review approved plans, specifications and submittals for special inspection requirements. Comply with special inspection requirements of the enforcing jurisdiction in accordance with the applicable code, approved plans and specifications. Notify the contractor of deviations from approved plans and specifications. If the deviations are uncorrected, notify the registered design professional in responsible charge and the building official of deviations. Submit progress reports to the registered design professional in responsible charge and the building official, describing tests that were performed and compliance of work. Submit final summary report stating whether work requiring special inspection was in conformance with the approved plans and applicable provisions of the building code.

2. Materials

Verify that brick, block, cement, lime, aggregates, reinforcement, connectors, water, admixtures and other materials are the type specified and approved. Verify that materials are properly stored.

Verify that mix proportions, material handling and mixing are in accordance with code requirements. Verify that grout is batched in accordance with approved mix. Determine the required material strengths, type and frequency of tests to be performed. Observe sampling, field testing and fabrication of test specimens. Verify that masonry strength meets approved specifications. Verify proper sample identification, site storage, protection and transportation to the testing laboratory.

3. Masonry Placement

Verify that the condition of substrate is acceptable for placement, that mortar is properly placed and that the masonry units are placed in accordance with the approved plans. Verify that the type, quantity, size, spacing and location of embedded items are as specified. Verify that the location and preparation of movement joints are in accordance with the approved plans, specifications and building code requirements. Verify that the masonry is protected from temperature extremes and adverse weather conditions.

4. Reinforcement and Connector Placement

Verify that the reinforcing steel and connectors comply with required size, spacing, profile, condition and quantity requirements, as indicated by both the approved plans and installation drawings.

Verify that reinforcing steel and connectors are placed in the proper location within acceptable tolerances. Verify minimum coverage and clearance to masonry surfaces.

Verify that hooks, bends, ties, stirrups and supplemental reinforcement are fabricated and placed as specified. Verify that required lap lengths, stagger and offsets are provided. Verify installation of approved mechanical connections per manufacturer's instructions and/or evaluation reports.

5. Grout Placement

Verify that grout spaces are free of obstructions and that cleanouts are provided as required. Verify that methods of conveying and placing grout avoid contamination and segregation and comply with time limits and grout lift requirements. Verify that grout is being properly consolidated and reconsolidated during placement.

D. Special Inspection of Structural Steel and Bolting

1. General Requirements

Review approved plans and specifications for special inspection requirements. Comply with special inspection requirements of the enforcing jurisdiction. Notify the contractor of deviations from approved plans and specifications. If the deviations are uncorrected, notify the registered design professional in responsible charge and the building official of deviations. Submit progress reports to the registered design professional in responsible charge and the building official, describing tests that were performed and compliance of work. Submit final summary report stating whether work requiring special inspection was in conformance with the approved plans and applicable provisions of the building code.

2. Material Sampling, Testing and Verification

Verify that the steel shapes and bolts are of the type, size, grade and condition specified on the approved plans and specifications. Verify the required type, quantity, location and frequency of tests to be performed, and witness preparation of properly identified test material samples on all materials. Provide or arrange for documentation and transportation of samples to the laboratory. Verify that required testing is performed on materials as required by applicable standards and specifications.

3. High-Strength Bolting

Verify correct type, size and location of bolts and bolt holes, nuts and washers for type of connection specified on approved plans and specifications. Verify protected storage of bolts, nuts and washers as required by applicable standards and specifications. Verify that faying surfaces at connections utilizing high-strength bolts are in compliance with applicable standards. Observe or conduct bolt tension verification tests on required high-strength bolt assemblies. Identify and verify joint type and installation of bolt assemblies per approved plans and specifications. Verify use of the approved method and sequence of bolt tightening.

4. Steel Framing Observation

Verify that structural steel frame orientation, details and frame member sizes are in accordance with approved plans and specifications. Verify that column base plates are the designed configuration, have correct hole size and proper clearance for grouting.

Verify grout placement and sampling. Verify that base plates are securely seated and fastened in accordance with applicable plans and specifications.

E. Special Inspection of Structural Welding

1. General Requirements

Review approved plans and specifications for special inspection requirements. Comply with special inspection requirements of the enforcing jurisdiction. Notify the contractor of deviations from approved plans and specifications. If the deviations are uncorrected, notify the registered design professional in responsible charge and the building official. Submit progress reports to the registered design professional in responsible charge and the building official, describing tests that were performed and compliance of work. Submit final summary report stating whether work requiring special inspection was in conformance with the approved plans and applicable provisions of the building code.

2. Material Sampling, Testing and Verification

Verify that the steel shapes, base metals, filler metals and gases are of the type, size, grade and condition specified on the approved plans, specifications and Welding Procedures Specifications. Verify the required type, quantity, location and frequency of tests to be performed, and witness preparation of properly identified test material samples on all materials. Provide or arrange for documentation and transportation of samples to the laboratory. Verify that required destructive testing is performed on materials as required by applicable standards and specifications. Verify that required nondestructive examinations are performed as required by applicable standards and specifications.

3. Structural, Reinforcing and Sheet Steel Welding

Verify that the welding equipment and process has the capability to produce the specified welds. Insure that welding equipment is calibrated and appropriate for use with the welding process.

Verify and/or witness qualification of welders, welding operators and tackers for conformance with AWS standards and specifications. Verify that welders are qualified to perform the specified work. Verify that the proposed welding procedure for structural steel, reinforcing steel and sheet metal is a standard prequalified procedure, or has been properly qualified and approved. Verify that welding processes, sequences and procedures are followed in accordance with approved Welding Procedures Specifications. Review approved plans and specifications for weld types and locations.

Verify that filler materials are stored and handled in accordance with manufacturer and project specifications. Verify that base metal to be welded is properly prepared and oriented. Verify that weldments have proper joint geometry and have backing and start/runoff tabs where required.

Inspect to ensure that weld and structural steel repairs are performed in accordance with approved procedures. Verify that fabricated elements are within permissible

tolerances. Verify that welds have the specified length and effective throat. Verify that the weld profile meets applicable shape, size and quality requirements. All welding Inspectors shall be AWS Certified Welding Inspector (CWI). An ICC Welding Certification will not be accepted as the sole welding certification but may be in addition to CWI.

F. Special Inspection of Spray-applied and Intumescent Fireproofing

1. General Requirements

Review approved plan and specifications for special inspection requirements. Comply with special inspection requirements of the enforcing jurisdiction. Notify the contractor of deviations from approved plans and specifications. If the deviations are uncorrected, notify the registered design professional in responsible charge and the building official. Submit progress reports to the registered design professional in responsible charge and the building official, describing tests that were performed and compliance of work. Submit final summary report stating whether work requiring special inspection was in conformance with the approved plans and applicable provisions of the building code.

2. Materials, Preparation, Application and Testing

Verify that the proposed materials are of the type specified, are properly stored and have been approved by the registered design professional in charge and the building official. Verify that the substrate has been properly prepared and is free of oil, dirt, scale, loose paint or primer and other materials that may prevent adequate adhesion. Identify the members to be fireproofed and the minimum required coverage and thickness. Verify the condition of the finished application.

Determine the required type and frequency of tests to be performed. Observe the sampling, field testing and fabrication of test specimens. Verification that materials are of type specified, properly stored and approved; verification that the substrate has been properly prepared and free of conditions which may prevent adhesion; identification of members to be fireproofed, the minimum required coverage and thickness of the fireproofing, and the condition of the finished application; and determination of the required tests and observation of sampling, field testing and fabrication of test specimens.

G. Special Inspection of Soils

Special inspections for existing-site soil conditions fill placement and load-bearing requirements shall be as required in Section 1705.6 and Table 1705.6.

APPENDIX B. SPECIAL INSPECTOR QUALIFICATION STANDARDS

The minimum qualifications listed are from IAS AC291, Accreditation Criteria for Special Inspection Agencies, and are given as examples of qualifications. IAS AC291 criterion undergoes periodic revisions to keep pace with code changes, industry standards and changes in inspection protocol. The most current revision of IAS AC291 is available at www.iasonline.org/resources/accreditation-criteria-for-special-inspection-agencies-ac291/.

Experience is difficult to replace with education, and where the responsible professional for an agency provides his or her signature as evidence of competency for the special inspector, it should be respected. Ultimately, the CBC places the responsibility for approval of special inspectors and special inspection agencies upon the building official.

A. Experience

1. In order for experience to count toward qualifications, it must be based on verifiable work directly related to the category or type of inspection involved.
2. An engineering degree (BS) plus appropriate in-house training may be substituted for not more than one year of experience. An engineering technology degree (AA) plus appropriate in-house training may be substituted for not more than six months of experience. (Degree experience may not be substituted for more than half of the experience requirements in any category.)
3. Five or more years of experience as a qualified special inspector in one or more categories of work may fulfill up to half of the experience requirements in any category, at the discretion of the (agency's) responsible professional engineer.

B. Certification

Certification, when specified, is intended to mean successful completion of an ICC examination appropriate to the category of work involved, with the exception that all welding inspectors shall be AWS Certified Welding Inspector (CWI). An ICC Welding Certification will not be accepted as the sole welding certification but may be in addition to CWI.

C. Special Inspector in Training

1. The intent of this provision is to provide practical opportunities for an inspector to gain the needed experience to qualify as a special inspector.
2. An inspector who does not meet the qualifications for special inspector may be allowed to perform "special inspection" at the discretion of the agency's responsible professional engineer, provided one or more of the following conditions are met:
 - Individual is working under direct and continuous supervision of a special inspector fully qualified for the type of work involved.

- Individual is working under indirect or periodic supervision of a special inspector, and the scope of work is minor and/or routine and within the capabilities of the individual.
- Individual is specifically approved by the building official.

Reference Abbreviations and Recognized Certifying or Accreditation Agencies

AA	Associate of Art (degree)
AABC	Associated Air Balance Council
ACI	American Concrete Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
ASNT	American Society for Nondestructive Testing
ASTM	American Society for Testing and Materials
AWCI	Association of the Wall and Ceiling Industry
AWS	American Welding Society
BS	Bachelor of Science (degree)
CWI	Certified Welding Inspector
EIFS	Exterior Insulation and Finish System
FM	Factory Mutual Global
IAS	International Accreditation Service
IBC	International Building Code
ICC	International Code Council
ICC-ES	ICC Evaluation Service
NOT	Nondestructive Testing
NICET	National Institute for Certification of Engineering Technologists
PE	Professional Engineer
RDP	Registered Design Professional
SI	Special Inspector
SIA	Special Inspection Agency
UL	Underwriters Laboratories

MINIMUM QUALIFICATIONS FOR SPECIAL INSPECTORS ^{a, b}

SPECIAL INSPECTION CATEGORY	REQUIRED EXPERIENCE	REQUIRED CERTIFICATION(S)	NOTES
Concrete Construction prestressed/precast	Note c	ICC Prestressed SI & ICC Reinforced Concrete SI	
Reinforced concrete	Note c	ICC Reinforced Concrete SI or ACI Concrete Construction SI	
NDT	120 hours for Level II	ANSI/ASNT-CP-189 NOT or SNT-TC-1a NOT	
Pier and pile foundations	Note c	NICET II (geotechnical or construction, or construction material testing or soils)	
Post-installed structural anchors in concrete	Note c	ICC Reinforced Concrete SI or ACI Concrete Construction SI	
Soils	Note c	ICC Soils SI or NICET II (geotechnical construction, or construction material testing or soils)	
Spray-applied, fire-resistant materials Intumescent fire-resistant coatings Mastic fire-resistive coatings	Note c	ICC Spray-applied Fireproofing SI or ICC Fire Inspector	
Steel (high-strength bolting)	Note c	ICC Structural Steel and Bolting SI	
Steel (welding)	5 years minimum or per AWS	AWS CWI required, ICC Structural Welding SI may be in addition	
Masonry construction	Note c	ICC Structural Masonry SI	
Wood construction	Note c	ICC Commercial Building Inspector or ICC Residential Building Inspector	
EIFS	Note c	AWCI EIFS Inspector	
Firestop systems	Note c	UL firestop exam or FM firestop exam	
Wall panels, curtain walls and veneers	Note c	ICC Commercial Building Inspector or ICC Residential Building Inspector	
Smoke control systems	Note c	AABC technician certification	
Mechanical systems	Note c	ICC Commercial Mechanical Inspector or ICC Residential Mechanical Inspector	
Fuel-oil storage and piping systems	Note c	ICC Commercial Mechanical Inspector, ICC Residential Mechanical Inspector or API Above- ground Storage Tank Inspector	

SPECIAL INSPECTION CATEGORY	REQUIRED EXPERIENCE	REQUIRED CERTIFICATION(S)	NOTES
Structural cold-formed steel	Note c	ICC Commercial Building Inspector or ICC Residential Building Inspector	
Excavation-sheeting, shoring and bracing	Note c	NICET II (geotechnical or construction, or construction material testing or soils)	
High-pressure steam piping (welding)	5 years minimum or in accordance with AWS	AWS CWI required ICC Structural Welding SI may be in addition	
Structural safety-stability/mechanical demo	Note c	RDP, PE, BS engineering/ architecture or valid site safety manager certification	
Site storm drainage disposal and detention	Note c	ICC Soils SI or NICET II (geotechnical construction, or construction material testing)	
Sprinkler systems	Note c	ICC Commercial Building Inspector or ICC Residential Building inspector	
Standpipe systems	Note c	ICC Commercial Building Inspector or ICC Residential Building Inspector	
Heating systems	Note c	ICC Commercial Mechanical Inspector or ICC Residential Mechanical Inspector	
Chimneys	Note c	ICC Commercial Mechanical Inspector or ICC Residential Mechanical Inspector	
Seismic isolation systems	Note c	RDP, PE, BS engineering/architecture	
Special cases	Note c	ICC Commercial Building Inspector or ICC Residential Building Inspector	

Notes:

- a. It is recognized that the development of qualified inspectors requires those individuals to obtain experience performing inspections of actual work. The requirements herein include such experience, as do some of the required certifications. To provide a vehicle for individuals to obtain this experience, they shall perform inspections in accordance with written associate or apprentice programs that are prepared by the IAS, approved by the IAS and meet the requirements of the local governing authority. These programs must include, at a minimum, passing certification exams, when available, administered by third-party agencies, such as ICC and ACI; in-house SIA and third-party training; observation by the associate or apprentice of inspections performed by certified inspectors; and performance by the associate or apprentice inspectors of duplicate inspections with certified inspectors. This written program will also determine the use of associate or apprentice inspectors and will limit their use based upon the level of supervision and the complexity of the inspection assignment. The complexity of an assignment shall be minimal and will often be task specific. Supervision should be direct, with a certified inspector being present at the site with the associate or apprentice. The associate or apprentice to certified inspector ratio on a project site shall not exceed 1:1. All documents related to work by an associate or apprentice inspector must be cosigned by a certified inspector. The written program must

include documentation of compliance with the program.

- b. When qualifications for special inspectors are locally defined, by statute, ordinance or rule that meet or exceed the requirements outlined in this criteria, these local requirements shall be recognized.
- c. Applicants shall comply with one of the following education and experience requirements:
 - 1. PE, licensed architects or RDP, and a minimum of three months of relevant work experience; or
 - 2. BS in engineering, architecture or physical science, and a minimum of six months of relevant work experience; or
 - 3. Two years of verified college or technical school (a copy of a diploma or transcript required), and a minimum of one year of relevant work experience; or
 - 4. High school or equivalent graduate (a copy of a diploma or certificate required), and a minimum of two years of verified relevant work experience; or
 - 5. A minimum of three years of verified relevant work experience.