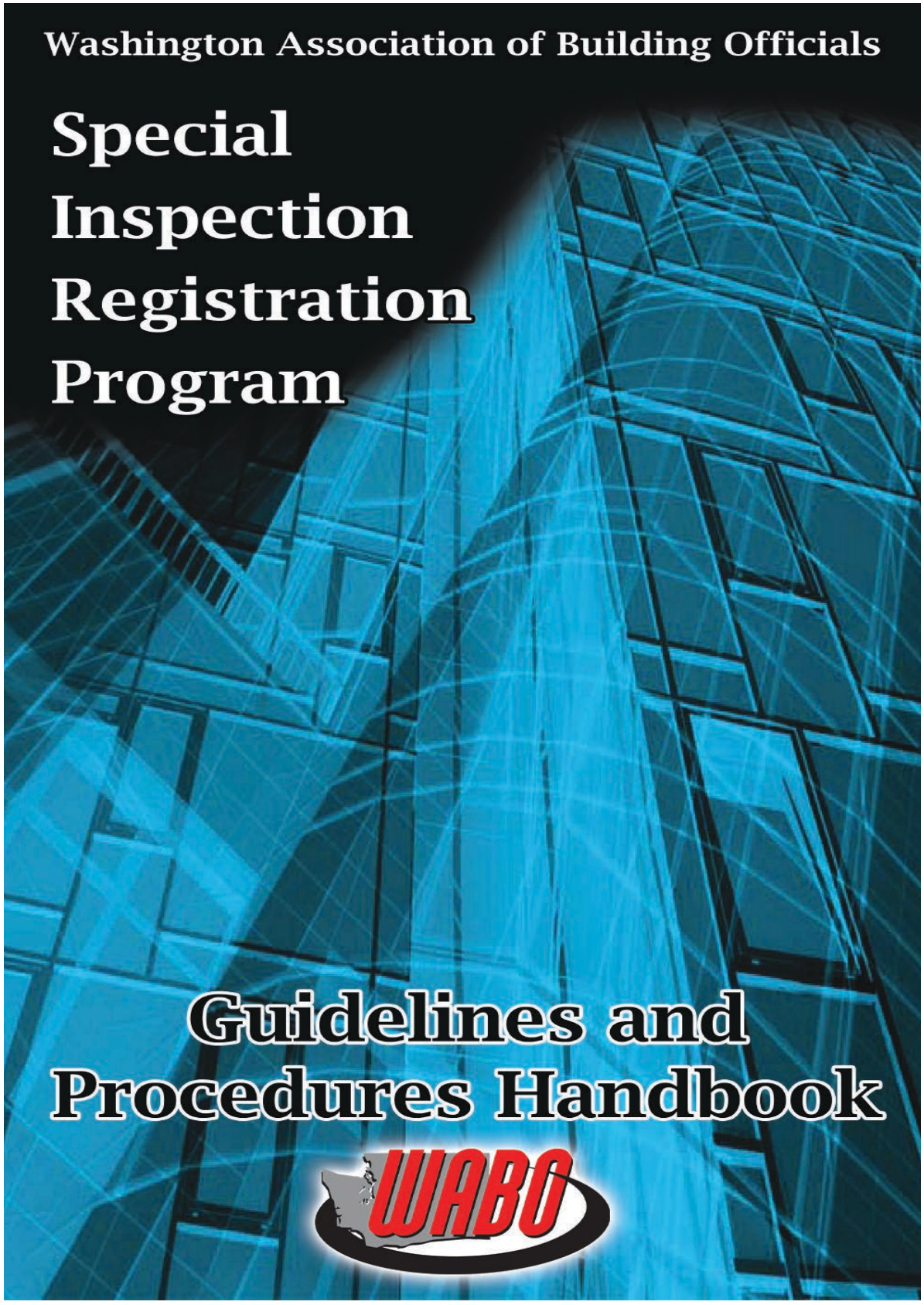
Washington Association of Building Officials

Special Inspection Registration Program



Guidelines and Procedures Handbook

WABO

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INTRODUCTION

Special inspection, as required by Chapter 17 of the International Building Code (IBC) is best defined as the monitoring of materials and workmanship which are critical to the integrity of the building structure and warrant special attention, as specified by the design professional in charge and/or the building official. The monitoring is to verify that the material and workmanship comply with the approved plans, specifications, and contract documents.

Special inspection is provided by an approved special inspection/testing agency with qualified management, supervisors, and special inspectors. A special inspector is a qualified individual who has demonstrated competence and have been approved by the building official to perform certain types of inspection.

It is the responsibility of the building official to determine the competency of special inspection agencies and special inspectors. To assist the building official, WABO established a registration program to prequalify special inspection agencies and special inspectors to perform the tasks of "Special Inspection." These guidelines and procedures are aligned with the ICC Model Program for Special Inspection. These were developed and made available as a helpful resource to all parties involved in the special inspection process.

This program is designed around the philosophy that "special inspection" referenced in the International Building Code (IBC) Section 1704 is an Approved Agency, organized with qualified management, and supervisory personnel, special inspectors and laboratory technicians together with the appropriate equipment and facilities to conduct material testing in accordance with those standards stipulated in the IBC. Verification and observance of processes and procedures pertaining to proper installation practice of specific products and material.

SCOPE

These Guidelines and Procedures are limited to those categories of Special Inspection currently administered by the WABO Special Inspection Registration Program. Geotechnical (soils, piles, and pier foundations), EIFS and smoke control system inspections **are not currently** addressed by this program. It is the responsibility of the building official to approve special inspectors for these items. Recommendations for minimum inspector certifications can be found in Appendix C of the ICC Special Inspection Manual.

Where code sections are designated in these Guidelines and Procedures, they refer to the 2021 Washington State Building Code (Chapter 51-50 WAC).

PURPOSE OF SPECIAL INSPECTION

Special inspection is the monitoring of materials and workmanship which are critical to the integrity of the building structure by reviewing the work of the contractors and their employees to assure that the approved plans and specifications are being followed and relevant codes and ordinances are being observed.

The special inspection process is in addition to the inspections conducted by the jurisdiction’s building inspector IBC Section 110 and by the registered design professional (RDP) as part of structural observations. The special inspectors furnish continuous and/or periodic inspection at times specified in the Approved Construction Documents as prescribed by Chapter 17 and/or as required by the registered design professional in responsible charge.

Good communication between the special inspector, design professional in responsible charge, contractor, and building official is essential.

1. SPECIAL INSPECTION

1.1 GENERAL

The Building Code has set forth a number of situations in which the employment of a special inspector is mandatory. The owner is required to provide specially qualified inspectors for continuous and/or periodic inspection during construction in addition to called inspections provided by the jurisdiction and in addition to periodic structural observations provided by the design professional.

The use of special inspectors is not discretionary. IBC, Section 1704 and 1705, clearly states the conditions under which they must be utilized, however there is a provision for the building official to waive special inspection for work of a minor nature.

"The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection." See 2021 IBC, 1704.2.1

It is the responsibility of the building official to determine the competency of special inspectors and the special inspection agencies. To assist the building official with this responsibility, WABO established a program to prequalify agencies and special inspectors to perform the tasks of "Special Inspection." WABO publishes a registry of prequalified agencies and special inspectors with their approved categories which is available on the website www.wabo.org.

1.2 CODE-REQUIRED SPECIAL INSPECTIONS

Special inspections are generally reserved for complex installations requiring certain highly developed inspection skills or testing capabilities in one or more of the construction categories. These generally include:

1.2.1 Inspection Of Fabricators – Section 1704.2.5 where fabrication of structural load-bearing members, including but not limited to (steel, wood, concrete, masonry and as may be specified in approved construction drawings) and assemblies are being performed on the premises of the fabricator. **Note** the exception for fabricators approved by the building official in Section 1704.2.5.1

1.2.2 Steel Construction – Section 1705.2 for detailed information regarding inspections, IBC references and other recognized standards. Exception outlined in section 1705.2 discussing steel fabrication without heating operations of any kind. Submittal of a detailed fabrication procedure to the Building Official is required.

1.2.2.1 Structural Steel – 1705.13.1.1 special inspections for structural steel in seismic force-resisting systems in structures assigned to Seismic Design Category B, C, D, E, F shall be conducted in accordance with AISC 341. See exceptions1&2. Quality assurance requirements, including but not limited to, nondestructive testing is required in accordance with AISC 341.

1.2.2.2 Cold-Formed Steel Deck – 1705.2.2 requires inspection of steel floors and roof decks per SDI QA/ QC.

1.2.2.3 Open-Web Steel Joist And Joist Girders – Requires periodic special inspections comply with table 1705.2.3.

1.2.2.4 Cold-Formed Steel Trusses Spanning 60 Feet Or Greater – 1705.2.4 special inspection shall verify temporary & permanent installations conform to *approved* truss submittal package.

1.2.3 Concrete Construction – 1705.3 States that concrete construction will be required special inspection unless work meets exceptions: See Table 1705.3 for detailed information regarding inspections. **Note** Exceptions 1,2,3,4 and 5 in Section 1705.3 discussing footings for buildings three stories or less, nonstructural slabs, foundations and certain exterior concrete features when placed on grade. Be aware of criteria allowing use of these exceptions.

1.2.4 Masonry Construction – Requires special inspection and tests be performed in accordance with the quality assurance programs prescribed by TMS (The Masonry Society) 402 (code requirements) and TMS 602 (master specification). Minimum Inspection frequencies are outlined as Level 1, 2 and 3. **Note** Exceptions 1, 2 and 3 discusses empirically designed masonry, masonry foundations, masonry fireplaces. Section 1705.4.1 outlines requirements for glass unit masonry or veneer designed in Risk Category IV structures.

1.2.5 Wood Construction – Inspection of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5 Site-built assemblies shall be in accordance with Section 1705.5. 1705.5.1 requires special inspection of High-load diaphragms. Items to be inspected include but not limited to: Wood panels, grade & thickness, framing members at adjoining panels, fastener type, diameter, and length. Also verify fastener lines and spacing.

1.2.6 Structural Wood 1705.12.1 (Wind) Similar See 1705.13.2 (Seismic) – When approved construction documents require special inspection, continuous special inspection is required for field gluing operations on elements of the Main Seismic/Wind Force-Resisting System. Periodic special inspection is necessary on other structural elements such as: fasteners, bolting, anchors and shear wall construction including diaphragms, drag structs, collectors, braces and hold-downs. **Note the exception:** special inspection is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the seismic force-resisting system, where the lateral resistance is provided by structural sheathing, and the specified fastener spacing at the panel edges is more than 4 inches (102 mm) on center.

1.2.7 Mass Timber Construction – 1705.5.3 requires special inspection of *Mass Timber* construction in buildings of Types IV-A, IV-B, and IV-C construction. The required inspections in Table 1705.5.3 should be conducted in accordance with this guideline and as required in the approved construction documents.

1.2.8 Sealing Of Mass Timber Construction – 1705.20 requires periodic special inspections of sealants or adhesives where sealant or adhesive required by Section 703.7 is applied to Mass Timber building elements. The locations should be designated in the approved construction documents.

1.2.9 Cold-Formed Steel Framing (Light-Frame Construction) 1705.12.2 (Wind) Similar See 1705.13.3 (Seismic–*Seismic Design Category*, C, D, E, or F) – When required Periodic special inspection is required on structural elements of the Main Wind /Seismic resisting system. Items to be inspected include: screw or welded attachments, shear wall and diaphragm construction, bolts, and hold-downs. **Note:** Exception special inspection is not required when gypsum or fiberboard is used or specific sheeting is used and fasteners are spaced more than 4 inches on center.

1.2.10 Soils* – Inspect 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 and load bearing requirements for existing soils meet the requirements of the approved soils report. See Section 1705.6 **Note:** When no soils report is required by Building Official; As a minimum special inspectors must verify projects in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D1557.

1.2.11 Driven Deep Foundations* – Inspection of installation and testing of driven deep foundations elements. See Table 1705.7

1.2.12 Cast-In-Place Deep Foundations* – Inspection of installation and testing of cast-in-place deep foundation elements. See Table 1705.8

1.2.13 Helical Pile Foundations* – Inspection of installation of helical pile foundations, including installation equipment used, pile dimensions, tip elevations, final depth, final installations torque and other applicable installation data. The approved geotechnical report and construction documents prepared by the RDP shall be used to determine final compliance. See Section 1705.9

1.2.14 Sprayed Fire-Resistant Materials – Inspection of fire-resistive material applied to structural elements of floors, roofs and wall assemblies, including structural members in accordance with Sections 1705.15.1 through 1705.15.6. Tests (substrate, thickness, density, and bond) required in this section are based on sampling from specific floor, roof and structural members. Special inspection and test shall be conducted after the rough installation of MEP including sprinkler and suspension systems. These tasks would apply to cementitious, fibrous, and intumescent products. The required sample size shall not exceed 110% of that specified by the referenced standard in Sections 1705.15.4.1 through 1705.15.4.9.

1.2.15 Mastic And Intumescent Fire-Resistant (FP) Coatings 1705.16 – Special Inspection shall be conducted in accordance with the American Wall and Ceiling Institute (AWCI) 12-B. Special inspections and test shall be performed during construction. Additional visual inspection shall be performed after the rough in installation and, where applicable, prior to the concealment of electrical, automatic sprinkler, mechanical and plumbing systems.

1.2.16 Architectural Components* – 1705.13.5 Periodic special inspection is required for the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category (SDC) D, E, F. See exceptions 1,2 and 3.

1.2.17 Access Floors* – 1705.13.5.1 Periodic special inspection is required for the anchorage of access floors in structures assigned Seismic Design Category D, E, or F.

1.2.18 Plumbing, Mechanical And Electrical Components* – 1705.13.6 Periodic special inspection is required for the anchorage of plumbing, mechanical, and electrical components. Specific criteria is outlined and identified in items 1-6.

1.2.19 Storage Racks* – 1705.13.7 Steel storage racks and steel cantilevered storage racks that are 8 feet in height or greater and assigned to Seismic Desing Category D, E, or F shall be provided with periodic special inspection as required by Table 1705.13.7. Periodic Special Inspection is required for: materials used, to verify compliance with one or more of the material test reports in accordance with the approved construction documents; fabricated storage rack elements; storage rack anchorage installation; and completed storage rack system, to indicate compliance with the approved construction documents.

1.2.20 Exterior Insulation And Finish Systems (EIFS)* – See Section 1705.17 for exceptions 1 and 2 to inspection when EIFS is applied over water-resistive barriers with a means for draining moisture to the exterior and EIFS installed over masonry or concrete walls.

1.2.21 Fire-Resistant Penetrations And Joints Section 1705.18 – High Rise Buildings or in Buildings assigned to Risk Category III or IV, or in fire areas containing Group R occupancies with an occupant load greater than 250. Special inspection of penetration firestop systems that have been tested and listed in accordance with ASTM E2174 shall be conducted. Fire-resistant joints systems that have been tested and listed shall be inspected per ASTM 2393.

1.2.22 Special Cases* – Inspections, in the opinion of the building official, that are needed because of the use of alternate materials, unusual design or use of materials not having building code approval or needing to meet special manufacturer requirements. See Section 1705.1.1 for examples where the building official has discretion to require special inspection.

1.2.23 Smoke Control* – Inspections involving testing of ductwork during erection, prior to concealment and prior to occupancy for pressure difference, flow measurements, and detection and control verification. See Section 1705.19.1

For more information on categories refer to Section 4, Job Task Descriptions.

***These categories are not currently covered under the WABO Program. It is recommended that a senior inspector (with over 5 years of experience) of a registered / approved agency apply and request local jurisdiction approval to perform this specific special inspection.**

1.3 WABO SPECIAL INSPECTION CATEGORIES

WABO Provides Registration of Special Inspectors for the following categories:

1.3.1 Placement Inspector: Must hold an American Concrete Institute Field Testing Technician- Grade I certification. Assists WABO registered Reinforced Concrete inspectors by sampling and monitoring fresh concrete. Independently tests and monitors fresh concrete for non-complex structures and structural elements provided reinforcing steel and any embedded items are previously inspected by a WABO registered Reinforced Concrete Inspector. (See WABO Standard 1701 Section 7.1 for a more detailed description of this category).

1.3.2 Post-Installed Anchor Inspector: Inspects the installation of approved post-installed anchor systems into concrete and masonry.

1.3.3 Reinforced Concrete Inspector: Inspects and tests cast-in-place and precast reinforced concrete with the exception of shotcrete and pre-stressed concrete.

1.3.4 Prestressed Concrete Inspector: Inspects and tests cast-in-place pre-cast pre-stressed/post tensioned concrete.

1.3.5 Shotcrete Inspector: Inspects the application of pneumatically placed concrete including placement of reinforcing steel.

1.3.6 Structural Masonry Inspector: Inspects structural masonry.

1.3.7 Structural Steel And Bolting Inspector: Inspects the erection of structural steel and verifies the proper tensioning of bolted connections.

1.3.8 Structural Welding Inspector: Inspects the fabrication and erection of structural steel including welds. **Note:** an American Welding Society (AWS) Certified Welding Inspector may perform inspection of structural steel fabrication.

1.3.9 Spray Applied Fire Resistive Materials Inspector: Inspects and tests the application of spray applied cementitious fireproofing materials and intumescent paint.

1.3.10 Structural Wood (Lateral Wood) Inspector: Inspects the installation of lateral load resisting wood framing.

1.3.11 Mass Timber Inspector: Conducts continuous and periodic inspections of mass timber structural elements and their connections per Section 1705.5.3, and of required sealants or adhesives used to resist passage of air at intersections of mass timber members per Sections 703.7 and 1705.20. This category is an added endorsement to agencies and inspectors who are registered in Structural Wood.

1.3.12 Cold-Formed Steel Framing Inspector: Inspects the installation of cold formed metal framing. Also inspects required welding of cold form metal framing.

1.3.13 Fire-Resistant Penetrations And Joints: Inspects for *through-penetrations*, membrane penetration firestops, *fire-resistant joint systems* and perimeter fire barrier systems.

WABO currently does not register special inspectors for Geotechnical (soils, piles, pier foundations), EIFS and smoke controls system inspections. It is the responsibility of the building official to approve special inspectors for these items. Recommendations for minimum qualifications can be found in ICC Special Inspection Manual.

2 DUTIES AND RESPONSIBILITIES

The development team members may include the building official, project owner, design professional, contractor, fabricator, and the special inspection agency. Of these members, the building official is the only member who has the legal authority to see that all the provisions of special inspection are carried out. This is clearly identified under the administrative provision of IBC, Section 104.1 which states, "The Building Official is hereby authorized and directed to enforce the provisions of this code" (including special inspection).

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. An example of these forms is included in Appendix A.

Each team member has his/her own duties and responsibilities to contribute to the process as follows:

2.1 DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR AND THE SPECIAL INSPECTION AGENCY

2.1.1 Acknowledge The Testing And Inspection Agreement And Structural Tests And Inspection Schedule.

Special inspectors and agencies must understand their role and scope of their responsibilities with written acknowledgment of special inspection and testing agreements (see sample agreement in Appendix A).

2.1.2 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.

2.1.3 Signify Presence At Job Site.

Special inspectors shall 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 next to the building permit (see sample special inspection record in Appendix A).

2.1.4 Report All Work For Which They Are Responsible.

Special inspectors shall inspect all work for conformance with the building official approved (stamped) plans and specifications and applicable provisions of the IBC.

2.1.5 Identify All Nonconforming Work.

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 in the work, the design professional in charge and the building official **shall be immediately notified** by telephone or in person and the item noted in the special inspector's written report (see sample discrepancy notice is in Appendix A).

2.1.6 The special inspector shall write a separate report (nonconforming log) to be posted at the job site regarding noted discrepancies which shall contain, at a minimum, the following information about each nonconforming item:

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

2.1.7 Provide Timely Reports.
The special inspector shall complete written inspection reports for each inspection visit, leaving a copy at the site, and provide the reports on a timely basis to the building official. The special inspector or inspection agency shall furnish these reports directly to the building official, design professional in charge and others as designated. These reports shall be organized on a daily basis and may be submitted weekly at the option of the building official.

Reports shall include all of the following:

2.1.7.1 Description of inspections and tests made with applicable locations grid line to grid line
2.1.7.2 List all conforming and nonconforming items
2.1.7.3 Indication of how nonconforming items were resolved
2.1.7.4 List of unresolved items, parties notified, time and method of notification
2.1.7.5 Itemization of changes authorized by design professional in charge if not included in nonconformance items

2.1.8 Submit A Final Signed Report.
Special Inspection Agencies shall submit a final signed report to the building official, and other designated parties on the development team, 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, approved changes and the applicable provisions of the IBC. Items not in conformance, unresolved items or any discrepancies in inspection coverage (i.e., missed inspections, periodic inspections when continuous was required, etc.) shall be specifically itemized in this report.

2.2 DUTIES AND RESPONSIBILITIES OF THE OWNER OR OWNER'S AGENT

The project owner, the registered design professional in responsible charge, or an agent of the owner is responsible for funding special inspection services. The special inspector/agency shall not be the employee of the contractor, subcontractor, or material supplier (see IBC Section 1704.2). In the case of an owner/contractor, the special inspector/agency shall disclose to the building official and registered design professional possible conflicts of interest and may be employed as specified by the building official.

The project owner must:

2.2.1 Be A Party To The Special Inspection And Testing Agreement.
(See sample agreement in Appendix A)
2.2.2 Be Responsible For Funding Special Inspection Services, Unless Responsibility Is Delegated To Agent.
2.2.3 Be Responsible For Selection Of The Special Inspection Services Provider, Unless Responsibility Is Delegated To Agent.
Most local jurisdictions will require that agencies and inspectors be selected from the WABO Special Inspection Agency and Inspector Register.

2.3 DUTIES AND RESPONSIBILITIES OF THE DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE

The design professional in responsible charge must:

2.3.1 Identify The Need For Special Inspection Services. (Statement Of Special Inspections)
Where special inspection is required, the design professional shall prepare a statement of special inspections per IBC, Section 1704.2.3 and 1704.3. Minimum content of required statement is outlined in 1704.3.1

2.3.2 Be A Consenting Party By Written Acknowledgment Of Special Inspection And Testing Agreements.
This acknowledgment provides the communications and understanding of special inspection services (see sample agreement in Appendix A).

2.3.3 Recommend And Assist In The Selection Of Special Inspectors.
Additional considerations include the number of special inspectors required, procedures for testing in the field and shop, and provisions for supervision of special inspectors.

2.3.4 Respond To Field Discrepancies.
The design professional in charge is instrumental in affecting the remedial process of uncorrected field deficiencies observed by the special inspector.

2.3.5 Review Shop Drawings And Design Changes.
The design professional is responsible for any design changes along with acknowledgment and approval of shop drawings, which provide detailed structural information, and for submission of such changes to the building official for approval.

2.4 DUTIES AND RESPONSIBILITIES OF THE "CONTRACTOR"

The contractor's responsibilities are to:

2.4.1 Notify The Special Inspector.
The contractor is responsible for notifying the Special Inspection Agency when inspections are required by the permit. Adequate notice shall be provided so that the special inspector has sufficient time to respond to the request (24 hours minimum or per the jurisdiction).

2.4.2 Convene A Preconstruction Meeting where tasks and responsibilities are clarified for special inspections.

2.4.3 Provide Access To Approved Plans.
The contractor is also responsible for providing the special inspector with access to approved plans at the job site.

2.4.4 Call To Request Jurisdictional Inspections.

2.4.5 Provide Access To The Work Requiring Inspection.
The contractor is responsible for providing adequate and safe access to work requiring inspection.

2.4.6 Provide Adequate Temporary Onsite Storage For Completed Test Specimens.

2.4.7 Retain Special Inspection Records.
The contractor is responsible for retaining at the job site all special inspection records submitted by the special inspector and providing these records for review by the building official upon request.

2.5 DUTIES AND RESPONSIBILITIES OF THE "BUILDING OFFICIAL"

The building official will:

2.5.1 Review And Examine Plans, Specifications, And Contract Documents For Compliance With Special Inspection Requirements.
The building official is charged with the legal authority to review the plans and specifications for compliance with the requirements of the IBC.

2.5.2 Communicate Special Inspection Requirements To The Development Team.
Once special inspection requirements are identified in the plan approval process and the structural tests and inspection schedule is completed and approved, the building official shall require these requirements to be incorporated into the approved plans. The building official may also require a preconstruction conference to review the required inspections and conditions of special inspection. Conditions of special inspection may include quality assurance hold points. The building official may also require additional pre-activity meetings prior to specific work elements including but not limited to shotcrete, structural masonry, post-tension concrete and structural steel erection.

2.5.3 Monitor The Special Inspection Activities.
The building official shall monitor the job site to see that special inspection is continuous, where required, and that an adequate number of special inspection staff is present depending upon extent and complexity of the project.

2.5.4 Review Inspection Report.
The building official receives, reviews, and makes the inspection reports part of the inspection records.

2.5.5 Perform Final Inspection.
The building official shall not approve the final inspection for a project until the final report from the special inspection agency and/or structural observer, when required, has been received and accepted by the building official.

2.5.6 Approve Special Inspectors/Inspection Agencies.
The building official is responsible for determining competence of special inspectors for the types of work they will be inspecting (1704.2.1). This can be done by utilizing the WABO Special Inspection Registration Program.

3 SPECIAL INSPECTOR RELATED PROCEDURES

3.1 EMPLOYMENT

The owner or the design professional in charge, acting as the owner's agent, shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704.2. The special inspection agencies shall not be in the employ of the contractor, subcontractor, or material supplier. In the case of an owner/contractor, the special inspection agencies shall be employed as specified by the building official.

3.2 REQUIRED (JURISDICTION) INSPECTIONS

The employment of a registered special inspection agency shall not be deemed to relieve the building official of responsibility for progress or required inspections as required by the code. Building official called inspections cannot be delegated to the special inspector; however, building official inspections shall not be signed off without the concurrence of the special inspector.

3.3 NOTIFICATION

The building official and special inspection agency shall be notified by the contractor prior to the commencement of any special inspection activities. The building official may require that such notification be filed in a specified period of time prior to such inspection. Such notification may be in writing or by telephone at the option of the building official and shall include the following:

3.3.1 Name of the special inspector
3.3.2 Project name and address
3.3.3 Building permit number
3.3.4 Type(s) of work to be inspected
3.3.5 Time and date of inspection

3.4 PERFORMANCE

The building official shall verify the work of the special inspector. The special inspector shall remain on the job at all times when work requiring inspection is in progress. Job site verification shall be done, at a minimum, in conjunction with required inspections routinely performed by the building official or jurisdiction's inspection staff. All questions relative to code requirements, interpretations of, or modifications/changes to the approved plans shall be referred to the building official.

3.5 NONCONFORMANCE PROCEDURE

When special inspectors observe a nonconformance occurring or about to occur, they must take the following steps:

3.5.1 Notify the contractor or his or her representative of the nature of the discrepancy and what the code or approved plans require.
3.5.2 If the contractor then chooses to proceed with the discrepancy, the special inspector must do the following:

3.5.2.1 **Immediately notify the building official** by telephone or other means of the nature of the discrepancy.
3.5.2.2 Notify the design professional in charge directly or through his or her employer.
3.5.2.3 Prepare a discrepancy notice and post this at the job site next to the building permit.

3.6 WRITTEN REPORTS

The special inspection agency shall promptly submit required written reports to the building official, the design professional in charge, and any other persons designated by the building official.

4 GENERAL JOB TASK DESCRIPTIONS

4.1 GENERAL JOB TASKS FOR ALL SPECIAL INSPECTOR TYPES

4.1.1 Responsibilities And Authority
Apply special inspector responsibilities and authority and comply with requirements of enforcing jurisdiction. Review and verify that project documents (plans and specifications) are approved by the building official and that the building permit is current.

4.1.2 Presence At Job
Be present for inspection during execution of all work required by the applicable building code.

4.1.3 Progress Report
Submit daily written reports of inspections to the local jurisdiction.

4.1.4 Report Discrepancies
Notify contractor when discrepancies occur. Notify the building official and designer when discrepancies are not corrected.

4.1.5 Plan Changes
Verify that structural plan changes are properly documented and approved by the enforcing jurisdiction.

4.1.6 Record Keeping
Maintain records of work inspected, including discrepancies and actions taken.

4.1.7 Compliance Report
Submit final report of compliance

4.2 SPECIFIC JOB TASKS FOR INDIVIDUAL SPECIAL INSPECTOR TYPES

4.2.1 Reinforced Concrete, Prestressed Concrete, Placement Inspector, Field Testing Technician And Shotcrete Special Inspectors

Please note that the following include all concrete related tasks. The inspector categories listed above are limited to specific tasks as defined in WABO Standard 1701, IBC table 1705.3 and ACI 318 as appropriate.

Concrete Mix Verification

4.2.1.1 Mix Design
Verify concrete mix design based on water/cement ratio or laboratory mix design, that cement type is as specified, that aggregate type, weight, and size are as specified and that admixtures are correct.

4.2.1.2 Trip Ticket
Determine that mixer truck trip ticket specifies mix in truck is mix required.

4.2.1.3 Mixing Water
Verify that total water added to mix does not exceed that allowed by trip ticket or concrete mix design and is of acceptable quality.

4.2.1.4 Concrete Delivery
Verify that concrete is delivered into the forms without segregation.

4.2.1.5 Quality Of Concrete
Verify that the quality of the concrete is indicative of adequate mixing time, consistency, and relevant time limits.

Concrete Reinforcement And Prestressing Steel

4.2.1.6 Reinforcing Steel Type And Grade
Verify type, grade, and visual conformity of Reinforcing Steel with acceptable quality standards.

4.2.1.7 Prestressing Steel Type And Grade
Verify prestressing steel type, size and grade, and tendon fabrication in conformance with acceptable quality standards.

4.2.1.8 Reinforcing Steel Condition
Verify that Reinforcing Steel is free of oil, dirt, excessive rust and from damage in shipment to job site.

4.2.1.9 Prestressing Steel Condition
Verify that prestressing steel is free of oil, dirt, scale, pitting, excessive rust; is free from damage; and is properly wrapped as required.

4.2.1.10 Reinforcing Steel Tying And Bracing
Verify that Reinforcing Steel is adequately tied, chaired, and supported to prevent displacement during concrete placement.

4.2.1.11 Prestressing Steel Ties And Supports
Verify that prestressing steel tendons and post tensioning ducts are adequately tied, chaired, and supported to prevent displacement during concrete placement and are adequate for intended stresses.

4.2.1.12 Reinforcing Steel Clearance
Verify minimum and maximum clear distances between bars and minimum structural distance to outside of concrete.

4.2.1.13 Prestressing Steel Clearance
Verify minimum and maximum clear distances between prestressing steel and minimum structural distance to outside of concrete.

4.2.1.14 Concrete Cover Over Reinforcing Steel
Verify minimum concrete cover is maintained between reinforcing steel and the surface of concrete.

4.2.1.15 Concrete Cover Over Prestressing Steel
Verify minimum concrete cover is maintained between prestressing steel and the surface of concrete.

4.2.1.16 Reinforcing Steel Placement
Verify size and placement of reinforcing steel.

4.2.1.17 Prestressing Steel Placement
Verify placement of prestressing steel, tendons or ducts as detailed in plans and specifications.

4.2.1.18 Reinforcing Steel Laps And Bends
Verify bar laps for proper length and stagger, and bar bends or minimum diameter, slope, and length.

4.2.1.19 Reinforcing Steel Welding
Verify that welding of reinforcing steel is approved and properly inspected. Verify weldability of reinforcing steel bars other than ASTM A 706 Periodic inspection single-pass fillet welds, maximum 5/16". Inspect all other welds in accordance with ACI 318 and AWS D1.4.

4.2.1.20 Prestressing Steel Anchorage
Verify location, size and placement of prestressing steel anchorage as detailed in plans and specifications.

4.2.1.21 Prestressed Rock And Soil Anchors
Verify that prestressed rock and soil anchors are fabricated and installed in accordance with national standards or project specifications for anchor work.

Concrete Form Work And Embedded Items

4.2.1.22 Concrete Construction Joint
Verify proper preparation of construction joint surfaces prior to placing.

4.2.1.23 Form Work Construction
Inspect form work for shape, location and dimensions of the concrete member being formed. See Table 1705.3

4.2.1.24 Embedded Items
Verify that embedded items are properly sized and placed.

4.2.1.25 Post Tensioning Ducts
Verify that post tensioning ducts are correctly sized, are mortar-tight and nonreactive with concrete, tendons, and filler materials.

Concrete Preparation And Placement

4.2.1.26 Concrete Base Preparation
Verify acceptable general condition of the concrete base prior to placement.

4.2.1.27 Prepour Base Moisture
Verify that the concrete base is properly wetted and standing water is removed before concrete is placed.

4.2.1.28 Concrete Placement
Verify that concrete conveyance and depositing avoids segregation due to rehandling or flowing, and proper joint construction.

4.2.1.29 Concrete Consolidation
Verify that concrete is properly consolidated.

Samples And Tests

4.2.1.30 Test Type
Determine the type and number of concrete, grout and reinforcing/prestressing steel tests required. Ensure that extra cylinders are made, and job cured for stressing determinations or as required by specifications.

4.2.1.31 Test Samples
Take proper test samples of fresh concrete and grout.

4.2.1.32 Slump Tests
Perform consistency (slump) tests.

4.2.1.33 Specimens Preparation
Prepare test specimens (cylinders, flex beams or shrinkage bars).

4.2.1.34 Hardened Concrete Test Samples
Witness removal of test samples and perform other test procedures on hardened concrete.

4.2.1.35 Air Tests
Perform air content tests.

4.2.1.36 Specimen Handling/Protection
Properly handle and place specimens in protected area after preparation and arrange for transportation of specimens to test facility.

4.2.1.37 Document Tests
Report tests performed and forward test results when necessary.

4.2.1.38 Nozzleman (Shotcrete)
Supervise preparation of nozzleman prequalification tests. (The mock-up panel shall represent the thickest and most congested area of the structure.)

4.2.1.39 Core Examination (Shotcrete)
Examine cores from prequalification test panel for bond between shotcrete and reinforcing steel; bond between adjacent concrete or masonry; evidence of sand streaks, voids, rock pockets, or other defects.

4.2.1.40 Production Test Panel Preparation (Shotcrete)
Supervise preparation of production test panels to obtain suitable cores for compression testing. Arrange positioning of test panels to represent job conditions.

Concrete Protection

4.2.1.41 Protection
Verify that appropriate hot and cold weather measures are taken for protection of the concrete and grout. Verify maintenance of specified curing temperature and techniques.

Prestressing and Grouting

4.2.1.42 Calibration Of Stressing Ram
Check for proper calibration of steel stressing ram.

4.2.1.43 Steel Stressing
Verify that steel is prestressed at the proper time using proper techniques, including stressing locations, sequence, and with proper records of stressing and steel elongations.

4.2.1.44 Prestressing Tension
Verify final prestressing steel tension immediately after anchorage, as specified.

4.2.1.45 Grout Mix Design And Placement
Verify grout mix design based on water/cement ratio or laboratory mix design and correct placement of grout into post tensioning ducts for bonded prestressing tendons.

4.2.1.46 Tendon Finishing
Verify correct trimming of excess tendon length after stressing and correct corrosion protection of stressing pockets.

Plan Reading

4.2.1.47 General Project Requirements
Review general notes and/or specifications and typical details for general project requirements for concrete strengths, reinforcing steel clearances, prestressed concrete requirements, and special inspection requirements.

4.2.1.48 Foundations And Below-Grade Walls
Review approved plans for reinforced and prestressed concrete construction requirements for foundations, below-grade walls, piles or belled caissons, pile caps and grade beams.

4.2.1.49 Beams, Girders And Joists
Review approved plans for reinforced and prestressed concrete construction requirements for beams, girders, and joists.

4.2.1.50 Columns
Review approved plans for reinforced concrete column construction requirements.

4.2.1.51 Slabs
Review approved plans for reinforced and prestressed concrete slab construction requirements.

4.2.1.52 Miscellaneous Details
Review approved plans for reinforced and prestressed concrete construction requirements for stairs, above-grade walls, and other special details.

4.2.2 Structural Masonry Special Inspectors
Minimum verification and inspection levels & tasks per TMS 402&602 – Tables 3& 4; including but not limited to items indicated below:

Masonry Materials Storage And Certifications

4.2.2.1 Masonry Material Certifications
Verify masonry material certifications, bills of materials, or other documentation of masonry units, cement, lime, and additives for compliance with plans and specifications. Verify materials are in acceptable condition.

4.2.2.2 Storage Of Materials

Verify that cement, lime, block, and brick are supported on pallets and covered to protect from exposure to excessive moisture or drying. Verify aggregates are stored free from contamination and to minimize segregation.

4.2.2.3 Masonry Reinforcing Material Certifications

Verify masonry reinforcing materials certifications, or other documentation of masonry reinforcement, for compliance with codes, plans and specifications. Verify reinforcing materials are in acceptable condition.

Mortar Mix

4.2.2.4 Mortar Aggregates

Verify that sand and aggregates are clean and have acceptable gradation.

4.2.2.5 Mortar Cement

Inspect mortar cement for dryness, type, and conformance to specified requirements.

4.2.2.6 Mortar Water

Verify that clean water and only approved additives and admixtures are used.

4.2.2.7 Job-Mix Mortar Proportioning And Mixing

Verify job-mix mortar proportioning of cement, aggregates, and admixtures, for consistency, workability and mixing time.

4.2.2.8 Ready-Mix Mortar

Inspect ready-mixed mortar for type and conformance to specified requirements.

4.2.2.9 Mortar Use

Verify mortar elapsed time since mixed. Verify that mortar is not rehandling tempered after set.

Masonry Preparation And Placement

4.2.2.10 Dowels/Anchor

Inspect alignment of dowels and anchors extending out of the footings for masonry walls.

4.2.2.11 Base Conditions

Verify that masonry footing surfaces are clean.

4.2.2.12 Condition Of Units

Verify that masonry units are clean and sound.

4.2.2.13 Placement

Inspect the laying of masonry units, checking temperature, dimensions and alignment of finished work, laying of masonry units, for stack or running bond or variations as per plans. Verify that there is no deep furrowing of bed joints. Inspect mortar joints for proper thickness and tooling.

4.2.2.14 Joints

Inspect construction, expansion and contraction joints for location and continuity of steel.

Masonry Reinforcement

4.2.2.15 Vertical Reinforcement
Inspect the placement and alignment of vertical bars and dowels for size, grade and spacing. Inspect length of lap splices, clearances between bars, clearances to masonry units and outside face of wall, and positioning of steel.

4.2.2.16 Horizontal Reinforcement
Inspect horizontal joint reinforcement (HJR) steel and masonry reinforcement bars for size, length of lap splices, dowels, clearance between bars, clearance to masonry units and outside face of walls, and alignment.

4.2.2.17 Ties
Inspect ties in masonry for straightness, embedment, spacing and size.

4.2.2.18 Anchor Connections
Inspect the installation of masonry anchor bolts, joist anchors, inserts and straps.

Grout Mix

4.2.2.19 Grout Aggregates
Verify that sand and aggregates are clean and have acceptable gradation.

4.2.2.20 Grout Cement
Inspect grout cement for dryness, type and conformance to specified requirements.

4.2.2.21 Grout Water
Verify that clean water and only approved additives and admixtures are used.

4.2.2.22 Job-Mix Grout Proportioning And Mixing
Inspect job-mix grout proportioning of cement, aggregates and admixtures for consistency, workability and mixing time.

4.2.2.23 Ready-Mix Grout
Verify ready-mixed grout for conformance with mix design, consistency and workability.

4.2.2.24 Grout Use
Verify grout elapsed time since mixed. Verify that grout is not retempered after set.

Masonry Grouting And Capping

4.2.2.25 Grout Spaces
Verify that grout spaces are correctly sized and clean, clean outs are closed after inspection and grout barriers are in place before grouting.

4.2.2.26 Dry Packing
Verify proper application of dry packing.

4.2.2.27 Grouting
Verify proper grouting technique including consolidation to approved height of grout space, rehandling consolidation and vibration.

4.2.2.28 Capping
Verify construction of wall cap for weather tightness.

Samples And Tests

4.2.2.29 Verify F'm Submittals Approval By Responsible Design Professional (RDP)

4.2.2.30 Prisms Test (When Required)
Inspect the construction of test prisms including those required prior to beginning construction. Verify that test prisms contain the same masonry units, moisture content, mortar and workmanship as used in the building.

4.2.2.31 Tests And Specimens
Observe test specimens and field tests as required.

4.2.2.32 Specimen Handling/Protection
Verify protection of test specimens and arrangements for pickup or delivery of specimens to appropriate persons.

4.2.2.33 Masonry Samples
Witness removal of test specimens from completed masonry.

Masonry Protection

4.2.2.34 Special Protection
Verify that masonry protection is in conformance with code, plans and specifications.

Plan Reading

4.2.2.35 General Project Requirements
Review specifications, general notes, and typical details for general project requirements for masonry type, reinforcing steel grades, clearances, and special inspection and testing requirements.

4.2.2.36 Foundations And Below-Grade Walls
Review approved plans for reinforced masonry construction requirements for foundations and below-grade walls.

4.2.2.37 Above-Grade Walls
Review approved plans for reinforced masonry construction requirements for above- grade walls.

4.2.2.38 Beams And Lintels
Review approved plans for reinforced masonry construction requirements for beams and lintels.

4.2.2.39 Columns
Review approved plans for reinforced masonry column construction requirements.

4.2.2.40 Miscellaneous Details
Review approved plans for special reinforced masonry construction requirements.

4.2.3 Structural Steel And Welding Special Inspectors
Minimum inspection tasks per AISC 360 Quality Assurance Chapter N & ASIC 341 Quality Assurance Chapter J (seismic) as appropriate; including but not limited to items listed below:

Steel And Welding Materials

4.2.3.1 Structural Steel Materials
Verify mill test reports, steel identification markings, or other documentation of structural steel for compliance with plans and specifications. Verify bolts, nuts and washers materials for conformance.

4.2.3.2 Welding Materials

Verify filler material certification, container identification markings, or other documentation of welding materials for compliance with approved weld procedures and the applicable Structural welding code. Verify that rod containers are undamaged, or electrodes are otherwise dried when required.

Welding

4.2.3.3 Qualification Of Welders

Verify qualification of welders, welding operators and tackers for conformance with specifications of the Structural Welding Code-Steel (ANSI/AWS D1.1), Structural Welding Code-Sheet Steel (ANSI/AWS D1.3), Structural Welding Code - Reinforcing Steel (ANSI/AWS D1.4), Structural Welding Code - Seismic Resistance (ANSI/AWS D1.8).

It is recommended jurisdictions require that structural steel, sheet steel, reinforcing steel, and seismic restricted access welders hold the appropriate, unexpired "WABO Certified Welder Card."

4.2.3.4 Storage Ovens

Verify appropriate storage ovens are utilized, when required.

4.2.3.5 Welding And Joint Preparation

Verify that base metal to be welded is smooth, uniform, free from fins, tears, and cracks, and cut edges are acceptable. Verify that the weld joint bevel, dimensions and fit-up conforms to the approved Weld Procedure and Structural code.

4.2.3.6 Welding Procedures

Review weld procedures for compliance with the specified Structural Welding Code.

4.2.3.7 Welding

Verify welding is done in conformance with the approved weld procedure requirements for process, materials, workmanship, number of passes, preheat and inter pass temperatures, cleaning between passes, weld lengths, welding technique and welding sequence.

4.2.3.8 Weld Repairs And Heat Straightening

Verify that weld repairs and heat straightening of structural members is done in accordance with approved procedures.

4.2.3.9 Fabrication And Materials Tolerances

Verify that fabrication and material are within permissible tolerances.

4.2.3.10 Reinforcing Steel Welding

Verify that welding of reinforcing steel is done in conformance with approved procedures.

4.2.3.11 Visual Inspection

Visually inspect all welds in accordance with provision of IBC 1705.2.1, AWS, and the **quality assurance** requirements outlined in AISC 360 Chapter N and AISC 341 (seismic) chapter J as appropriate. (Visual inspection must be conducted prior to non-destructive testing.)

4.2.3.12 *Tables N5.4-1 through N5.4-3 – Outline specific tasks & inspection frequency, additional tasks may include but not be limited to the following:*

4.2.3.12.1 Production Tests

Verify that preproduction and production welding tests are correctly performed.

Steel Erection And Structural Connections

4.2.3.13 Base Plates And Anchor Bolts
Verify correct size, location and setting of base plates, (anchor bolts should be verified prior to concrete placement) and base plate holes.

4.2.3.14 Erection
Verify that steel members are placed in the correct location and configuration of the structural drawings. Verify the correct alignment of members such as brace frames and beams. Verify that the erection joint is correct as shown on the structural drawings.

4.2.3.15 Welding Sequence
Verify that welding sequence is followed where specified.

4.2.3.16 Faying Surfaces
Verify faying surfaces on connections utilizing high-strength bolts for compliance to applicable standards.

4.2.3.17 Bolted Connections
Verify correct type, location and size of bolts and size of bolt holes in connections. Verify that the proper method of bolt tensioning is performed and the correct tension is achieved for high-strength bolts to applicable standards.

Samples And Non-Destructive Tests

4.2.3.18 Bolt And Nut Sampling
Verify that the *fastener assemblies* and pretensioned installation procedures are performed as required prior to installation.

4.2.3.19 Steel Sampling
Mark steel members for sampling, record sample numbers and locations, observe specimen cutting and arrange for transportation of specimens to test facility.

4.2.3.20 Non-Destructive Testing
Arrange for and/or verify non-destructive testing in accordance with code requirements and project specifications.

Plan Reading

4.2.3.21 General Project Requirements
Review general notes and/or specifications and typical details for general project requirements for steel strengths, fabrication tolerances and special inspection requirements.

4.2.3.22 Orientation And Frame Member Sizes
Review approved plans for structural steel orientation and frame elevation member sizes.

4.2.3.23 Decking
Review approved plans for structural steel decking requirements.

4.2.3.24 Columns And Base Plates
Review approved plans for column and base plate member sizes.

4.2.3.25 Joints
Review approved plans for all steel-to-steel connections.

4.2.3.26 Other Details
Review approved plan details for structural steel and welding requirements for stairs, elevator shafts, concrete to-steel connections and other structural steel requirements.

High Strength Fasteners (Bolting)

4.2.3.27 Bolting connections requirements and inspection tasks are contained in AISC 360 Specification for Structural Steel Buildings Quality Assurance requirements outlined in Chapter N; AISC 341 (seismic) Chapter J as appropriate.

4.2.3.28 Tables N5.6-1 through N5.6-3 - Outline specific tasks, combined with provisions of the Research Counsel on Structural Connections (RCSC) specification, additional tasks may include but not be limited to the following:

4.2.3.28.1 Verify correct type, location and size of bolts and size of bolt holes in connections. *

4.2.3.28.2 Verify that the proper method of bolt tensioning is performed and the correct tension is achieved for high-strength bolts to applicable standards.

4.2.3.29 Bolt And Nut Sampling

Verify that the *fastener assemblies* and pretensioned installation procedures are performed as required prior to installation as a minimum:

4.2.3.29.1 Verify Connection type:

a. Snug-tight connection
b. Pretension connection
c. Slip-Critical connection

4.2.4 Spray Fire-Resistive Materials Inspectors

General Duties

4.2.4.1 Manufacturer Recommendations
Review manufacturer recommendations.

4.2.4.2 Substrate Conditions
Verify substrate conditions for cleanliness prior to application.

4.2.4.3 Application
Verify application is in accordance with manufacturer recommendations.

4.2.4.4 Thickness
Verify thickness of fire-resistive material is in accordance with ASTM E605 (IBC Section 1705.15.4.1 beams, columns and floor).

4.2.4.5 Density
Remove and deliver sample sets to laboratory for density tests, in accordance with ASTM E605 (IBC Section 1705.15.5 samples for beams, columns and floor)

4.2.4.6 Bond Strength
Perform cohesive/adhesive bond strength of cured sprayed fire resistive materials in accordance with ASTM E736 (IBC Section 1705.15.6).

4.2.4.7 Reinspection
Reinspect areas repaired due to insufficient thickness, density or damage from sampling, tenant improvements, panel placement, rain, etc.

4.2.4.8 Mastic And Intumescent Fire-Resistant Coatings

Special inspection and test for mastic and intumescent fire-resistant coating when applied to structural members shall be in accordance with AWCI 12-B and approved construction documents. (IBC Section 1705.16) Special inspections and tests shall be performed during construction. Additional visual inspection shall be performed after the rough in installation and, where applicable, prior to the concealment of electrical, automatic sprinkler, mechanical and plumbing systems.

4.2.5 Fire-Resistant Penetration And Joints

4.2.5.1 Special Inspection is required building classified a high-rise or assigned to Risk Category III or IV.

4.2.5.2 Inspection of through-member (wall, floor, ceiling, shaft, etc) penetrations, membrane penetrations, membrane firestops.

4.2.5.3 Including fire resistant joint systems and perimeter fire barrier systems have been tested and listed.

Penetration Firestops: 1705.18.1

4.2.5.4 Inspection shall be in accordance with IBC 714.4.1.2, 714.5.1.2 and ASTM E2174.

Typical Tasks Include

4.2.5.4.1 Review of submitted inspection documents.

4.2.5.4.2 Verify materials and systems bear a listing label.

4.2.5.4.3 Inspection frequency shall depend on method of inspection and scope of project.

4.2.5.4.4 Method shall be agreed upon “prior to conducting” on site verification.

4.2.5.4.5 Method (I) inspector to be on site during installation and randomly witnessing minimum of 10% of each type of fire stop being installed or;

4.2.5.4.6 Method (2) inspector shall conduct a “post installation” which requires a destructive type of verification of fire stop and repair.

4.2.5.4.7 A minimum of 2% but not less than one of each type of fire stop shall be inspected.

4.2.5.4.8 See ASTM E2174 for additional inspection criteria.

4.2.5.4.9 Compliance to International Firestop Council (IFC) guidelines be used when conducting destructive testing.

Fire-Resistant Joint Systems: 1705.18.2

4.2.5.5 Inspection shall be in accordance with IBC 715.3 and 715.4 and ASTM E2393.

Typical Tasks Include

4.2.5.5.1 Review submitted inspection documents; all material must be identified on the inspection documents.

4.2.5.5.2 Verify materials and systems bear a listed label.

4.2.5.5.3 Listed designs shall be provided for every fire resistive joint system Inspections shall identify any construction detail on the inspection documents that will not be visible after the fire resistive joint system is installed.

4.2.5.5.4 Inspector shall verify compliance by observing the inspection and taking and recording measurements of the substrates and materials being installed or by destructive examination.

4.2.5.5.5 Inspection frequency will depend on the method and scope of project.

4.2.5.5.6 Inspector shall be on site to witness no less than a minimum of 5% of total linear feet of each type of fire resistive joint system being installed.

4.2.5.5.7 The method used for conducting destructive testing (post-inspection) must be approved by the projects AA (Authorizing Authority)

4.2.6 Wood Construction (Structural Wood) Inspection Tasks Per 1705.5 (Prefab Panels, Structural Element & Assemblies), 1705.5.3 (Mass Timber), 1705.12.1 (Wind), 1705.13.2 (Seismic), And 1705.20 (Mass Timber Sealants And Adhesives), Including Tasks Below As Applicable:

Structural Systems

4.2.6.1 Lateral Systems

Identify lateral systems for conformance including shear walls, diaphragms, cords, sub-diaphragms, hold-downs, connectors & drag struts.

4.2.6.2 Vertical Load Path

Verify location and placement of plates, shear walls, diaphragms, squash blocks, hold downs, and strapping, beams, and columns. Verify stud spacing, blocking, panel material and orientation, nail, screw & pin size and spacing. Anchor bolt spacing and location, strap size and location and use of glue.

4.2.6.3 Mass Timber Construction

4.2.6.3.1 Verify anchorage and connections to deep timber foundation systems.

4.2.6.3.2 Observe erection and sequence of construction: Verify labels on mass timber elements and member placement is in accordance with approved plans.

4.2.6.3.3 Verify threaded fasteners installation: Verify installation equipment and procedures are in accordance with fastener manufacturer's instructions. Verify fastener type, size, number, spacing, and installation angle are in accordance with approved plans.

4.2.6.3.4 Verify adhesive anchors are installed in accordance with Section 4.8 of this handbook.

4.2.6.3.5 Observe bolted connection installation: Verify bolt type and size, and number of bolts is in accordance with approved plans. Verify connector plate or hangar size and installation is in accordance with approved plans or manufacturer's instructions.

4.2.6.3.6 Observe concealed connections: Verify concealed connection installation is in accordance with approved plans and manufacturer's instructions.

4.2.6.3.7 Verify sealants or adhesives are installed to form a continuous bead so as to resist passage of air through mass timber member intersections.

4.2.6.3.8 The items listed above should be inspected according to the following schedules for initial and subsequent inspections. For the purposes of this Handbook, the schedules are deemed to comply with the requirement for periodic special inspections on mass timber:

a. Initial Inspections. Initial inspections should be conducted until the erection crew shows competency in the erection process.

i. Verify labels and placement of every mass timber member installed in the first story of mass timber construction.

ii. Continuously observe the installation of each type of connection. No fewer than 10 installations of each type of connection should be observed.

iii. Continuously observe the installation of sealants or adhesives used to resist passage of air through mass timber member intersections. No fewer than 5 installations at each type of intersection should be observed.

b. Subsequent Inspections. Once the erection crew has established competency through the initial inspections, subsequent inspections can be made in accordance with the following schedule. Subsequent inspections should verify ongoing erection crew competency and confirm compliance with the approved drawings and manufacturer's instructions.

I. Subsequent inspections should be made a minimum of once per production day or once per story, whichever is less, and should be made on a random sampling of the inspected items. Random samples should not all be taken in the same general location.

II. Verify labels and placement of no fewer than 20 members for every 10,000 square feet of floor area, or portion thereof.

III. For visible connections, verify number, spacing, and type of fasteners (threaded or bolts), and hangers or connectors for every connection that is visible. Observe the installation process for no fewer than 20 connections for every 10,000 square feet of floor area, or portion thereof.

IV. For concealed connections, observe the installation process for no fewer than 20 connections for every 10,000 square feet of floor area, or portion thereof. This is in addition to the observations required for visible connections.

V. For sealants or adhesives, observe the installation process for no fewer than 20 installations for every 10,000 square feet of floor area or portion thereof.

c. Deficiencies. If at any time non-conforming connection or sealant/adhesive installations are discovered, the inspection frequency should revert to the schedule for initial inspections above. Once competency has been reestablished, the frequency can return to the schedule for subsequent inspections.

Material Identification

4.2.6.4 Wood
Verify labels, species & grade, dimensions, sheathing materials, and engineered lumber.

4.2.6.5 Hardware
Verify hangers, hold downs, strap, tie, rod, nut, anchor, engineered system, and prefabricated panel size, type, & location. Verify that hardware manufacturer is as specified. Review & verify manufacturer's installation procedures and instructions.

4.2.6.6 Fasteners
Verify that all screws, nails, bolts and related fasteners are in accordance with approved plans and drawings.

4.2.6.7 Submittals
Review submittals for, fasteners, tolerances, and requirements for inspection.

Workmanship

4.2.6.8 Use Of Materials
Identify proper use of material including cutting, notching, nailing, fastening & member alignment & perforation location.

4.2.6.9 Material Condition
Verify material condition including member damage, shipping, handling, weather and hardware.

4.2.6.10 Samples And Tests
Perform pull out tests for anchor bolts installed in concrete.

Plan Reading

4.2.6.11 General
Review general notes, specifications, general details for project requirements for member size and placement, load paths, fasteners and hardware.

4.2.6.12 Foundation Connections
Reviewed approved plans for anchorages, location and hardware type.

4.2.6.13 Beams And Columns
Review approved plans for size type, & location of beams and columns.

4.2.6.14 Preconstruction Checklist
Verify preconstruction checklist has been completed.

4.2.6.15 Approved Plans
Review approved plans for placement, member size and spacing, sheathing, fasteners, connectors, and mass timber sealants or adhesives.

4.2.7 Cold-Formed Steel Framing Special Inspectors

Structural Systems

4.2.7.1 Lateral Systems
Identify lateral systems for conformance including shear walls, diaphragms, cords, sub-diaphragms, hold-downs, connectors & drag struts.

4.2.7.2 Vertical Load Path
Verify location and placement of plates, shear walls, diaphragms, squash blocks, hold downs, & strapping, beams and columns. Verify stud spacing, blocking, panel material and orientation, nail, screw & pin size and spacing. Anchor bolt spacing and location, strap size and location and use of glue.

Material Identification

4.2.7.3 Cold Formed Steel
Verify mil size (gage) & dimensions, sheathing materials and coating. Verify material labeling and that mill certifications have been approved.

4.2.7.4 Hardware
Verify hold downs, strap, tie, rod, nut, anchor, engineered system, and prefabricated panel size, type, & location. Verify that hardware manufacturer is as specified. Review & verify manufacturer's installation procedures and instructions.

4.2.7.5 Fasteners
Verify that all screws, bolts and related fasteners are in accordance with approved plans and drawings.

4.2.7.6 Welding Materials
Verify mill test reports, container identification markings, or other documentation of welding materials for compliance with plans and specifications. Verify that rod containers are undamaged, or electrodes are otherwise dried when required.

4.2.7.7 Submittals
Review submittals for screws, screw guns, tolerances, and requirements for inspection.

Workmanship

4.2.7.8 Use Of Materials
Identify proper use of material including cutting, notching, nailing, fastening and member alignment and perforation location.

4.2.7.9 Material Condition
Verify material condition including member damage, shipping, handling, weather and hardware.

4.2.7.10 Welding
Verify welder qualifications. Visually inspect all filet welds of cold formed steel framing for conformance with AWS requirements for process, workmanship, and weld dimensions.

Note: Welding of Structural Steel must be inspected by a structural welding inspector.

4.2.7.11 Samples And Tests
Perform pull out tests for anchor bolts installed in concrete.

Plan Reading

4.2.7.12 General
Review general notes, specifications, general details for project requirements for member size and placement, load paths, fasteners and hardware.

4.2.7.13 Foundation Connections
Reviewed approved plans for anchorages, location and hardware type.

4.2.7.14 Beams And Columns
Review approved plans for size type, & location of beams and columns.

4.2.7.15 Preconstruction Checklist
Verify preconstruction checklist has been completed.

4.2.7.16 Approved Plans
Review approved plans for placement, member size and spacing, sheathing, fasteners and connectors.

4.2.8 Seismic Resistance: Post-Installed Anchors

General

4.2.8.1 Materials
Identify the specified anchor per the approved plans including manufacturer, model, diameter, and length. Verify the specified anchor for the proper application into the structure (e.g. proper anchor for installation into concrete, reinforced or unreinforced masonry) and anchor location.

4.2.8.2 Installation Procedures
Review manufacturer's installation procedure and ICC-ES Evaluation Report (ESR). Review the special inspection requirements detailed in the ESR.

Mechanical Anchors

4.2.8.3 Verify that the hole depth and geometry are in accordance with manufacturer's recommendations and approved contract documents.

4.2.8.4 Verify that the hole is clean and free of debris.

4.2.8.5 Verify that the anchor to be used is free of grease, oil, or dirt.

4.2.8.6 Observe the contractor inserting the anchor into the hole.

4.2.8.7 Observe the contractor setting the anchor by tightening it to the manufacturer's minimum specified torque (if applicable for anchor type).

4.2.8.8 Measure the "stick out" or free end of the anchor to assure the correct embedment depth has been achieved (this application may vary).

Adhesive Anchors

Special installation and inspection criteria is a requirement for anchors when installed in a horizontally or upward inclined orientations to resist sustained tension loads; see ACI 318-19 section 26.13.1.6 & R26.13.1.6 (Commentary)

4.2.8.9 Verify that hole depth and geometry are in accordance with manufacturer's recommendations and approved contract document.

4.2.8.10 Verify that hole is clean and free of debris in accordance with the ESR.

4.2.8.11 Verify the expiration date of the chemical.

4.2.8.12 When starting a new chemical (epoxy) cartridge, observe that the contractor is following the manufacturer's instructions and ensure that the product has been well mixed.

4.2.8.13 Observe the injection of the epoxy into the hole per the manufacturer's direction.

4.2.8.14 Verify that the reinforcing bar or threaded rod to be used is free of grease, oil, dirt, or excessive rust.

4.2.8.15 Verify that the anchor is installed into the hole per the manufacturer's direction.

4.2.8.16 Measure the "stick out" or free end of the dowel / rod to assure the correct embedment depth has been achieved.

4.2.8.17 Observe the specified tensioning of the anchor after the required cure time. Verify the correct structural element is anchored.

Samples And Tests

4.2.8.18 Perform pull out tests for anchor when required by approved project documents.

4.2.8.19 Conduct proof loading as appropriate when specified.

Plan Reading

4.2.8.20 General

Review approved plans, general notes, and specifications, general details for project requirements for specified anchor, number, and location.

4.2.8.21 Manufacturer's Documents

Review ESR and installation instructions for anchor.

APPENDIX A

SAMPLE JURISDICTION FORMS

(Forms May Be Photocopied)

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PROJECT_____ PERMIT #_____

ADDRESS_____ DATE_____

GENERAL INFORMATION:

- *Obtain a building permit before starting construction.*
- *This construction bulletin is intended to provide guidelines and a checklist of some special inspections that may be required per 202 Additional information can be found at your local b uilding department.*

Summary Statement of Special Inspections

In accordance with Section 1704.2.3, the applicant shall submit a statement of special inspections as a condition for permit issuance. When special inspection is required to be performed, the ***owner***, or the ***registered design professional in responsible charge*** acting as the owner's agent, is required to hire an independent testing/inspection agency to perform required special inspections.

The independent agency hired to perform the duties of special inspection is required to be a registered agency with Washington Association of Building Officials (WABO), under the Special Inspection Registration Program (SIRP) Standard No. 1701 or most current adopted special inspection standard published by WABO.

The design professional shall complete the attached forms and submit them to the Building Department prior to issuance of the building permit. The special inspectors assigned to any project within the Jurisdiction shall be currently registered with WABO and certified for the disciplines assigned.

The Summary of Special Inspections summarizes the special inspections and tests required for the project. Special Inspectors will refer to the approved plans and specifications for detailed special inspection requirements. Any additional tests and inspections required by the approved plans and specifications will also be performed.

A Final Report of Special Inspections documenting required special inspections, testing and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy (Section 1704.2.4).

The following are testing agencies and special inspectors that will be retained to conduct tests and inspections.

Responsibility	Firm	Address, Telephone, e-mail
1. Special Inspection Agency (except for geotechnical)		
2. Material testing Agency (Laboratory)		
3. Geotechnical Inspection Agency		
4. Other		

Summary of Special Inspection

For this project, check the required inspections per IBC Chapter 17

Architect	S Engr	MEP Engr	Special Inspections and tests	Notes
	☐		1705.1.1 Special Cases	
	☐		1705.2 Steel construction	
	☐		1705.2.1 Structural Steel	
	☐		1705.2.2 Cold-formed steel deck	
	☐		1705.2.3 Open-web steel joists and joist girders	
	☐		1705.2.4 Cold-formed steel trusses	
	☐		1705.3 Concrete construction	
	☐		1705.3 Concrete, reinf. & anchors (pre- or post-installed)	
	☐		1705.3.1 Welding of reinforcing bars	
	☐		1705.3.2 Material tests	
	☐		1705.4 Masonry construction	
	☐		1705.5 Wood construction	
	☐		1705.5.1 High-load diaphragms	
	☐		1705.5.2 Metal-plate-connected wood trusses	
	☐		1705.5.3 Mass timber construction	
	☐		1705.6 Soils	
	☐		1705.7 Driven deep foundations	
	☐		1705.8 Cast-in-place deep foundations	
	☐		1705.9 Helical pile foundations	
	☐		1705.10 Structural integrity of deep foundation 1705.11 Fabricated items**	
	☐		1705.13 Seismic force-resisting systems	
	☐		1705.13.1 Structural steel	
	☐		1705.13.2 Structural wood	
	☐		1705.13.3 Cold-formed steel light framed construction	
☐	☐	☐	1705.13.4 Designated seismic systems	
☐	☐		1705.13.5 Architectural components	
	☐	☐	1705.13.6 Plumbing, mechanical and electrical components	
☐	☐		1705.13.7 Storage racks	
	☐		1705.13.8 Seismic isolation systems	
	☐		1705.13.9 Cold-formed steel special bolted moment frames	
	☐		1705.14 Testing for seismic resistance	
	☐		1705.14.1 Structural steel	
☐	☐	☐	1705.14.2 Nonstructural components	
☐	☐	☐	1705.14.3 Designated seismic systems	
	☐		1705.14.4 Seismic isolation systems	
☐			1705.15 Sprayed fire-resistant materials	
☐			1705.16 Mastic and intumescent fire-resistant coatings	
☐			1705.17 Exterior insulation and finish systems (IEFS)	
☐			1705.18 Fire-resistant penetrations and joints	
☐			1705.18.1 Penetration firestops	
☐			1705.18.2 Fire-resistant joint systems	
☐		☐	1705.19 Testing for smoke control	
☐			1705.20 Sealing of mass timber	

** Off-site special inspection is not required for approved fabricators when approved by the building official.

Seismic Requirements (IBC 1704.3.2)
Describe the seismic force resisting system subject to special inspections in accordance with IBC 1705.13 and 1705.14

The extent of seismic force resisting system is defined in more details in the construction documents.

Seismic Requirements (IBC 1704.3.2)
Describe the designated seismic systems (non-structural components or systems that are essential to the intended function of a Risk Category IV structure or that is essential to Life Safety in structures assigned to other Risk Categories) subject to special inspections in accordance with IBC 1705.13 and 1705.14

The extent of the designated systems is defined in more details in the construction documents.

Structural Observation (IBC 1704.6)
Describe structural systems subject to structural observations when required by the provisions of IBC 1704.6.1

The extent of structural observation is defined in more details in the construction documents.

PLEASE CHECK WITH YOUR LOCAL JURISDICTION TO DETERMINE REQUIRED SIGNATURES

A. Owner Responsibilities

The owner or the design professional in responsible charge acting as the owner's agent, shall fund special inspection services. The owner is responsible for seeing that these requirements are met.

I have read and understand my responsibilities regarding special inspections.

Owner/ Agent:_____ **Signature:**_____ **Date:**_____

B. Registered Design Professional Responsibilities

1. The registered design professional in responsible charge (engineer, or architect), shall include special inspection requirements and specifications on the plans.
2. Provide structural observation where required per IBC Section 1704.6.
3. Prepare project specific Statement of Special Inspections in accordance with IBC section 1704.3 and identify special inspections or tests for seismic resistance per IBC Section 1704.3.2 where required. The Statement of Special Inspections shall identify items fabricated on the premises of an approved fabricator where special inspections are not required by Section 1704.2.5.
4. Review the special inspection reports and provide corrective action for work that may not conform to the approved plans.

I have read and understand my responsibilities regarding special inspections.

Registered Design Professional in Resp. Charge:_____

Signature:_____ **Date:**_____

Structural Engineer of Record:_____

Signature:_____ **Date:**_____

C. Contractor's Responsibilities

1. Notify the agency:
   The contractor is responsible for notifying the inspection agency in sufficient time for scheduling personnel to perform required inspections.
2. Written statement of responsibility:
   Contractor shall complete this form to satisfy IBC 1704.4 Contractor responsibility for construction of designated main-wind or seismic force resisting system. Additional information shall be provided where requested by the jurisdiction.
3. Provide access to Jurisdiction approved plans:
   The approved plans shall be readily accessible at the job site.
4. Provide access to work:
   The contractor shall provide reasonable access to all work requiring special inspection.
5. Retaining special inspection reports at the job site:
   The contractor is also responsible for retaining at the job site all special inspection records submitted by the special inspector and providing these records for review by the Building Department's inspector upon request.
6. Notify Jurisdiction of special inspections prior to scheduled inspection time.
7. Provide a copy of special inspector's credentials when requested by the jurisdiction.

D. Duties of the Special Inspector

1. **Inspect and/or test the work**:
   The inspector shall inspect and /or test the work for compliance with the Jurisdiction approved plans, specifications, and applicable provisions of the IBC. The architect/engineer's reviewed shop drawings, and/or placement drawings, may be used only as an aid to inspections.
   - ***Continuous Special Inspection*** – The full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.
   - ***Periodic Special Inspection*** – The part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed and at the completion of the work report non-conforming items:

The inspector shall bring non-conforming items to the immediate attention of the contractor and note all such items in the daily report. If any item is not resolved in a timely manner and is about to be incorporated in the work, the special inspector shall immediately notify the Building Department, the engineer, architect, or his/her office.

2. **Furnish daily reports**:
   The special inspector shall complete a daily report for each day's inspections. The daily reports shall remain at the job site with the contractor for the Building Department's inspector. The reports shall include the following:
   a. *Name of special inspector with WABO certification number and certification type, date, time, temperature and weather conditions.*
   b. *Description of the inspections, with locations and tests performed.*
   c. *Listing any non-conforming items.*
   d. *Include how items were resolved or unresolved.*
   e. *List any changes or corrections to non-conforming issues authorized by the engineer, architect, or Jurisdiction's building inspectors.*
3. **Furnish weekly reports**:
   The inspection agency shall furnish weekly reports of the tests and inspections performed directly to the Building Department, project engineer, architect, and/or others as designated.
4. **Furnish final report**:
   The inspection agency shall submit a final signed report to the Building Department stating that all items requiring special inspections and testing were fulfilled, all discrepancies were corrected or resolved, and all work requiring special inspections is in conformance with the approved design drawings and specifications.
   - Any items unresolved or discrepancies in coverage (i.e., missed inspections, periodic inspections when continuous was required, etc.) shall be specifically itemized in this report.

E. Submittals to the Building Official

1. In addition to the submittal of reports of special inspections and tests by the approved special inspection agency in accordance with IBC Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the building official for items listed in IBC 1704.5.

F. Jurisdiction

1. The Jurisdiction will review the implementation of Structural Tests and Special Inspection requirements.
2. Review special inspections:
   The Building Department shall review all special inspectors and special inspection requirements found in IBC Chapter 17 and the WABO - SIRP Standards 1701.
3. Monitor special inspections:
   Work requiring special inspections, and the performance of special inspectors, may be monitored by the Building Department's inspector. The jurisdiction's approval must be obtained prior to placement of concrete or other similar activities in addition to that of the special inspector.
4. Perform inspections as required by the local building code.
5. Issue Certificate of Occupancy:
   The Building Department will only issue a Certificate of Occupancy after all special inspection reports and the final special inspection report, have been submitted and accepted.

Special Inspection Final Report

City/County of: _____ Permit No: _____ Date: _____

Attention: _____

Project Name/Address: _____

In accordance with Chapter 17 of the International Building Code, special inspection has been provided for the following items:

I certify that I performed special inspection on the following portions of the work at the above address that required continuous inspections, and for which I was employed.

Based upon inspections performed and my substantiating reports, it is my professional judgement that, to the best of my knowledge, the inspected work was performed in accordance with the approved plans, specifications and applicable workmanship provisions of the International Building Code.

_____

Signature Inspection Agency

_____

Print Name ID/Certification Number

***Building official may require the signature / stamp of agency engineer responsible for special inspection.**

Cc: Project Owner

Washington Association of Building Officials
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(360) 628-8669 wabo@wabo.org
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