

CITY OF BATH, MAINE

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SPECIAL INSPECTIONS

The City's building code (1996 BOCA National Building Code) requires special inspections of certain features of commercial construction, as detailed in the text below. As detailed in the text, the design engineer (or licensed designee) must submit a list of special inspections to be performed and who will perform them prior to the issuance of a building permit. A sample cover/transmittal sheet for this submittal is below. The list of features to be inspected must correspond to the inspections listed in the text. The engineer or licensed designee must submit a final report at the end of the project summarizing the special inspection activities, and describing how any discrepancies were resolved prior to the issuance of the final/permanent Certificate of Occupancy.

SECTION 1705.0 SPECIAL INSPECTIONS

1705.1 General: The permit applicant shall provide *special inspections* where application is made for construction as described in this section. The special inspectors shall be provided by the permit applicant and shall be qualified and approved for the inspection of the work described herein.

Exceptions

1. *Special inspections* are not required for work of a minor nature or where warranted by conditions in the jurisdiction.
2. *Special inspections* are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. *Special inspections* are not required for occupancies in Use Group R-3 and occupancies in Use Group U that are accessory to a residential occupancy including, but not limited to, those listed in Table 312.1.

1705.1.1 Building permit requirement: The permit applicant shall submit a statement of *special inspections* prepared by the registered design professional in responsible charge in accordance with Section 114.2.1 as a condition for permit issuance. This statement shall include a complete list of materials and work requiring *special inspection* by this section, the *inspections* to be performed and a list of the individuals, *approved agencies* and firms intended to be retained for conducting such inspections.

1705.1.2 Report requirement: Special inspectors shall keep records of all *inspections*. The special inspector shall furnish *inspection* reports to the code official, and to the *registered design professional* in responsible charge. All discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the code official and to the *registered design professional* in responsible charge prior to the completion of that phase of the work. A final report of *inspections* documenting completion of all required *special inspections* and correction of any discrepan-

cies noted in the *inspections* shall be submitted prior to the issuance of a certificate of occupancy. Interim reports shall be submitted periodically at a frequency agreed upon by the permit applicant and the code official prior to the start of work.

1705.2 Inspection of fabricators: Where fabrication of structural loadbearing members and assemblies is being performed on the premises of a fabricator's shop, *special inspection* of the *fabricated items* shall be required. The *fabricated items* shall be *inspected* as required by this section and as required elsewhere in this code.

1705.2.1 Fabrication procedures: The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures which provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved drawings, project specifications and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

1705.2.2 Procedures implementation: The special inspector shall verify that the fabricator is properly implementing the fabrication and quality control procedures outlined in Section 1705.2.1.

Exception: *Special inspections* as required by Section 1705.2 shall not be required where the fabricator maintains an agreement with an *approved independent inspection or quality control agency* to conduct periodic in-plant *inspections* at the fabricator's plant, at a frequency that will assure the fabricator's conformance to the requirements of the *inspection agency's* approved quality control program.

1705.3 Steel construction: The *special inspections* for steel elements of buildings and structures shall be as required by Sections 1705.3.1 through 1705.3.3.

1705.3.1 Inspection of steel fabricators: The permit applicant shall provide *special inspection* of steel *fabricated items* in accordance with the provisions of Section 1705.2.



Exception: *Special inspection* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control which demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements and bolts are capable of being determined.

1705.3.2 Material receiving: All main stress-carrying elements, welding material and bolting material shall be *inspected* for conformance to Table 1705.3.2.

1705.3.3 Erection: *Special inspections* are required for bolts, welding and details as specified in Sections 1705.3.3.1 through 1705.3.3.3.

1705.3.3.1 Installation of high-strength bolts: *Inspection* shall be as specified in Section 9 of the RCSC *Specification for Structural Joints Using A325 or A490 Bolts* listed in Chapter 35.

Table 1705.3.2
INSPECTION FOR STEEL MATERIALS

Material	Inspection required	Reference ^a for criteria
Bolts, nuts, washers	1. Material identification markings. 2. Conformance to ASTM standards specified by the design engineer. Manufacturer's designation (certificate of compliance) is required.	Applicable ASTM material specifications; AISC ASD, Section A3.4; AISC LRFD, Section A3.3
Structural steel	1. Material identification markings. 2. Conformance to ASTM standards specified in the approved plans and specifications.	ASTM A6 or ASTM A568 Provide certified test reports in accordance with ASTM A6 or ASTM A568
Weld filler materials	1. Conformance to AWS specification as specified in the approved plans and specifications. Manufacturer's designation (certificate of compliance) is required.	AISC ASD, Section A3.6; AISC LRFD, Section A3.5

Note a. The specific standards referenced are those listed in Chapter 35.

1705.3.3.2 Welding: Weld *inspection* shall be in compliance with Section 6 of AWS D1.1 listed in Chapter 35. Weld inspectors shall be certified in accordance with AWS D1.1 listed in Chapter 35.

1705.3.3.2.1 Welding of the structural seismic-resisting system: Welding of the structural seismic-resisting system of buildings assigned to Seismic Performance Category C, D or E, in accordance with Section 1610.1.7, shall be inspected in accordance with Sections 1705.3.3.2.2 and 1705.3.3.2.3. Each complete penetration groove weld in joints and splices shall be tested for the full length of the weld either by ultrasonic testing or by other approved methods, for special moment frames and eccentrically braced frames.

Exception: The nondestructive testing rate for welds made by an individual welder is permitted to be reduced to 25 percent of the welds, with the approval of the *registered design professional* responsible for the structural design, provided the weld inspection reject rate is 5 percent or less.

1705.3.3.2.2 Column splice welds: Column splice welds, which are partial penetration groove welds, shall be tested by ultrasonic testing or other approved methods at a percentage rate established by the *registered design professional* responsible for the structural design. All partial penetration column splice welds designed for axial or flexural tension from seismic forces shall be tested.

1705.3.3.2.3 Base metal testing: Base metal having a thickness more than 1½ inches (38 mm) and subject to through-thickness weld shrinkage strains shall be ultrasonically tested for discontinuities behind and adjacent to the welds after joint welding. Any material discontinuities shall be evaluated based on the criteria established in the *construction documents* by the *registered design professional* responsible for the structural design.

1705.3.3.3 Details: The special inspector shall perform an *inspection* of the steel frame to verify compliance with the details shown on the approved *construction documents*, such as bracing, stiffening, member locations and proper application of joint details at each connection.

1705.4 Concrete construction: The *special inspections* for concrete elements of buildings and structures and concreting operations shall be as required by Sections 1705.4.1 through 1705.4.7.

Exception: *Special inspections* shall not be required for:

1. Concrete footings of buildings three stories or less in height which are fully supported on earth or rock.
2. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (0.11 kg/mm²).
3. Plain concrete foundation walls constructed in accordance with Table 1812.3.2.
4. Concrete patios, driveways and sidewalks, on grade.

1705.4.1 Materials: In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318 listed in Chapter 35, the code official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318 listed in Chapter 35. Weldability of reinforcement, except that which conforms to ASTM A706 listed in Chapter 35, shall be determined in accordance with the requirements of Section 1906.5.2.

1705.4.2 Installation of reinforcing and prestressing steel: The location and installation details of reinforcing and prestressing steel shall be *inspected* for compliance with the approved *construction documents* and ACI 318 (such as Sections 7.4, 7.5, 7.6 and 7.7) listed in Chapter 35. Welding of reinforcing of the structural seismic-resisting system shall be inspected for buildings assigned to Seismic Performance Category C, D or E, in accordance with Section 1610.1.7.

1705.4.3 Formwork: Forms for concrete, if used, shall be *inspected* for compliance with Section 6.1 of ACI 318 listed in Chapter 35, and with any additional design requirements indicated on the approved *construction documents*. *Inspection* of form removal and reshoring shall be conducted to verify compliance with Section 6.2 of ACI 318 listed in Chapter 35.



1705.4.4 Concreting operations: During placing and curing of concrete, the *special inspections* listed in Table 1705.4.4 shall be performed.

1705.4.5 Inspection during prestressing: *Inspection* during the application of prestressing forces shall be performed to determine compliance with Section 18.18 of ACI 318 listed in Chapter 35.

1705.4.5.1 Inspection during grouting: In buildings assigned to Seismic Performance Category C, D or E, in accordance with Section 1610.1.7, inspection during the grouting of bonded prestressing tendons in the structural seismic-resisting system shall be performed.

**Table 1705.4.4
REQUIRED INSPECTIONS DURING CONCRETING**

Required inspection	Reference ^a for criteria
1. Evaluation of concrete strength, except as exempted by Section 1908.3.1(3) of this code.	ACI 318 Section 5.6
2. Inspection for use of proper mix proportions and proper mix techniques.	ACI 318 Chapter 4, Sections 5.2, 5.3, 5.4 and 5.8
3. Inspection during concrete placement, for proper application techniques.	ACI 318 Sections 5.9 and 5.10
4. Inspection for maintenance of specified curing temperatures and techniques.	ACI 318 Sections 5.11, 5.12 and 5.13

Note a. ACI 318 listed in Chapter 35.

1705.4.6 Manufacture of precast concrete: The manufacture of precast concrete, as required by Section 1705.2, shall be subject to a quality control program administered by an *approved agency*.

1705.4.7 Erection of precast concrete: Erection of precast concrete shall be *inspected* for compliance with the approved plans and erection drawings.

1705.5 Masonry construction: The *special inspections* listed in Table 1705.5 shall be required for masonry construction where masonry is designed in accordance with ACI 530/ASCE 5/TMS 402 listed in Chapter 35.

**Table 1705.5
SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION**

Inspection or test	Referenced ^a criteria	
	ACI 530/ ASCE 5/ TMS 402	ACI 530.1/ ASCE 6/ TMS 602
1. Material		Sec. 2.3
2. Masonry strength		Sec. 1.4
3. Construction operations:		
a. proportioning, mixing consistency of mortar and grout		Sec. 2.6
b. Application of mortar and grout; installation of masonry units		Sec. 3.2 Sec. 3.5
c. Condition, size, location and spacing of reinforcement	Chapter 8	
d. Protection of masonry during cold weather (temperature below 40 degrees F.) or hot weather (temperature above 100 degrees F.)		Sec. 1.8
e. Anchorage	Sec. 4.2 Sec. 5.14 Note b	
4. Inspection of welding of reinforcement, grouting, consolidation and reconsolidation for buildings assigned to Seismic Performance Category C, D or E, in accordance with Section 1610.1.7.		Note b

Note a. The specific standards referenced are those listed in Chapter 35.

Note b. Referenced criteria not applicable.

1705.6 Wood construction: *Special inspections* of the fabrication process of wood structural elements and assemblies shall be in accordance with Section 1705.2. *Special inspection* is required for nailing, bolting, structural gluing or other fastening of the structural seismic-resisting system of buildings assigned to Seismic Performance Category C, D or E, in accordance with Section 1610.1.7.

1705.7 Prepared fill: The *special inspections* for prepared fill shall be as required by Sections 1705.7.1 through 1705.7.3. The approved report, required by Section 1804.1, shall be used to determine compliance.

1705.7.1 Site preparation: Prior to placement of the prepared fill, the special inspector shall determine that the site has been prepared in accordance with the approved report.

1705.7.2 During fill placement: During the placement and compaction of the fill material, the special inspector shall determine that the material being used and the maximum lift thicknesses comply with the approved report.

1705.7.3 Evaluation of in-place density: The special inspector shall determine, at the approved frequency, that the in-place dry density of the compacted fill complies with the approved report.

1705.8 Pile foundations: *Special inspections* of pile foundations are required as provided for in Section 1816.13 of this code.

1705.9 Pier foundations: *Special inspection* is required for pier foundations of buildings assigned to Seismic Performance Category C, D or E, in accordance with Section 1610.1.7.

1705.10 Wall panels and veneers: *Special inspection* is required for exterior and interior architectural wall panels and the anchoring of veneers for buildings assigned to Seismic Performance Category E, in accordance with Section 1610.1.7.



1705.11 Mechanical and electrical components: Mechanical and electrical components that are located in buildings assigned to Seismic Performance Category E shall be inspected, tested and certified as required by this section, in accordance with Section 1610.1.7.

1705.11.1 Component inspection: *Special inspection* is required for the installation of the following components where the component has a performance criteria factor of 1.0 or 1.5 in accordance with Section 1610.6.4.

1. Equipment using combustible energy sources.
2. Electrical motors, transformers, switchgear unit substations and motor control centers.
3. Reciprocating and rotating-type machinery.
4. Piping distribution systems, 3 inches and larger.
5. Tanks, heat exchangers and pressure vessels.

1705.11.2 Component and attachment testing: The component manufacturer shall test or analyze the component and the component mounting system or anchorage for the design forces in Section 1610.6.4 for those components having a performance criteria factor of 1.0 or 1.5 in accordance with Section 1610.6.4. The manufacturer shall submit a certificate of compliance for review and acceptance by the *registered design professional* responsible for the design, and for approval by the code official. The basis of certification shall be by test on a shaking table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces from Section 1610.6.4 or by more rigorous analysis. The special inspector shall inspect the component and verify that the *label*, anchorage or mounting conform to the certificate of compliance.

1705.11.3 Component manufacturer certification: Each manufacturer of equipment to be placed in a building assigned to Seismic Performance Category E, in accordance with Section 1610.1.7, where the equipment has a performance criteria factor of 1.0 or 1.5 in accordance with Section 1610.6.4, shall maintain an approved quality control program. Evidence of the quality control program shall be permanently identified on each piece of equipment by a label.

1705.12 Sprayed cementitious and mineral fiber fireresistive materials: Special inspections for sprayed cementitious and mineral fiber fireresistive materials applied to structural elements and decks shall be in accordance with Sections 1705.12.1 through 1705.12.5. Special inspections shall be based upon the fireresistance design as designated in the approved construction documents.

1705.12.1 Structural member surface conditions: The surfaces shall be prepared in accordance with the approved fireresistance design and the approved manufacturer's written instructions. The prepared surface of all structural members to be sprayed shall be inspected before the application of the sprayed fireresistive material.

1705.12.2 Application: The substrate shall have a minimum ambient temperature before and after application as specified in the approved manufacturer's written instructions. The area for application shall be ventilated during and after application as required by the approved manufacturer's written instructions.

1705.12.3 Thickness: The thickness of the sprayed cementitious and mineral fiber fireresistive materials applied to structural elements shall not be less than the thicknesses required by the approved fireresistance design. Thickness shall be determined by an approved method. Samples of the sprayed cementitious and mineral fiber fireresistive materials shall be selected in accordance with Sections 1705.12.3.1 and 1705.12.3.2.

1705.12.3.1 Floor, roof and wall assemblies: The thickness of the sprayed cementitious and mineral fiber fireresistive material applied to the underside of floor, roof and wall assemblies shall be determined by taking the average of ten measurements in a 144-square-inch (0.093 m²) sample area, having a minimum width of 6 inches (152 mm), for each 1,000 square feet (93 m²) of the sprayed area on each floor or part thereof.

1705.12.3.2 Structural frame members: The thickness of the sprayed cementitious and mineral fiber fireresistive material applied to structural members shall be determined by taking nine measurements at a single cross section for structural frame beams or girders, seven measurements at a single cross section for joists and trusses and twelve measurements at single cross section for columns. Thickness testing shall be performed on 25 percent of the structural members on each floor.

1705.12.4 Density: The density of the sprayed cementitious and mineral fiber fireresistive material shall not be less than the density specified in the approved fireresistance design. Density of the sprayed cementitious and mineral fiber fireresistive material shall be determined by an approved method at the frequency specified in Sections 1705.12.3.1 and 1705.3.2.

1705.12.5 Bond strength: The cohesive/adhesive bond strength of the cured sprayed cementitious and mineral fiber fireresistive material applied to structural elements shall not be less than the cohesive/adhesive bond strength specified in the approved fireresistance design. The cohesive/adhesive bond strength shall be determined by taking samples of the sprayed cementitious and mineral fiber fireresistive material as specified in Sections 1705.12.3.1 and 1705.12.3.2.

1705.13 Exterior insulation and finish systems (EIFS): Special inspections are required for field application of EIFS and prefabricated EIFS panels (see Section 1405.8).

1705.14 Special cases: *Special inspections* shall be required for proposed work which is, in the opinion of the code official, unusual in its nature, such as:

1. Construction of materials and systems which are alternatives to materials and systems prescribed by this code.
2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

STATEMENT OF SPECIAL INSPECTIONS

Project: _____

Location: _____

Permit Applicant: _____

Applicant's Address: _____

Structural Engineer of Record: _____

Name

Firm

Architect of Record: _____

Name

Firm

This Statement of Structural Inspections is submitted in accordance with Section 1705.0 of the 1996 BOCA National Building Code. It includes a listing of special inspections applicable to this project as well as the name of the Special Inspector, and the names of other agencies intended to be retained for conducting these inspections.

The Special Inspector shall keep records of all inspections listed herein, and shall furnish inspection reports to the Code Official and to the Registered Design Professional of Record. All discrepancies shall be brought to the immediate attention of the Contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the Code Official and to the Registered Design Professional of Record. Interim reports shall be submitted to the Code Official.

Prepared by:

Name

Signature

Preparer's P.E. Seal

Applicant's Authorization:

Signature

Date

Building Code Official:

Signature

Date