



CITY OF
BAINBRIDGE ISLAND

SPECIAL INSPECTION SCHEDULE

BUILDING PERMIT NUMBER

PROJECT TITLE

PROJECT ADDRESS

Applicants of projects requiring special inspection or testing per Section 1704 of the International Building Code as amended by Washington State must acknowledge and return this form to the City of Bainbridge Island. **THESE INSPECTIONS ARE *NOT* PERFORMED BY THE BUILDING DEPARTMENT AND MUST BE PERFORMED BY QUALIFIED SPECIAL INSPECTORS HIRED BY THE OWNER AND APPROVED BY THE BUILDING OFFICIAL.** Individuals certified in a special inspection category by **Washington Association of Building Officials (WABO)** and individuals employed by a recognized testing laboratory and under the direct supervision of a Civil or Structural Engineer are typically considered qualified at the discretion of the local jurisdiction having authority for Building Code Enforcement.

BEFORE A PERMIT CAN BE ISSUED: The Owner or his/her representative, on the advice of the responsible project engineer or architect, shall fill out completely, sign and submit two (2) copies of the attached “Structural Tests and Inspection Schedule” to this Department for review and approval including any requirements related to the Bainbridge Island Municipal Code.

The Owner and General Contractor and Inspection/Testing Agency, where applicable, shall also acknowledge the following conditions applicable to Special Inspection and/or Testing:

1. Inspection/Testing agency to submit names and qualifications of on-site special inspectors to the Building Division for approval **PRIOR TO PERMITS BEING ISSUED.**
2. All special inspections shall be continuous unless otherwise noted and approved by the Building Official.
3. It is the responsibility of the general contractor to review City approved plans for additional inspection or testing requirements that may be noted or required per City Code.
4. The general contractor is responsible for proper notification to the **Inspection/Testing Agency** for items listed on this form.
5. Special inspectors shall provide detailed weekly reports to the Building Division of all inspection activities.
6. Copies of all laboratory and inspection reports are to be sent directly to the Building Division by the Inspection/Testing Agency or other responsible party within a reasonable time to test results.
7. **BEFORE A CERTIFICATE OF OCCUPANCY CAN BE ISSUED:** The inspection/testing agency shall submit a statement that all items requiring testing and inspection have been fulfilled and reported and a final inspection letter shall be provided. Those items not tested and/or inspected shall be noted in this statement. A copy of the statement shall be maintained at the job site for the City Building Inspector’s review prior to final inspections.

A PRE-CONSTRUCTION MEETING IS REQUIRED. The City Building Inspector must be contacted in advance of any work noted below. It is the responsibility of the owner or owner’s designee to notify the special inspection agency AND schedule a building inspection in a timely manner. Copies of all inspection reports must be provided on-site, and summary letters submitted to Building Division and the registered design professional. **Unresolved nonconformances must be brought to the immediate attention of the City Building Inspector.** Send summary letters and nonconformance reports to Planning and Community Development at pcd@bainbridgewa.gov.

ACKNOWLEDGEMENTS

Prior to issuance of a building permit, the Owner, on the advice of the Project Engineer or Architect, shall complete, sign, and submit this form to the Building Official.

| | | |
|----------------------------|--------------------------------|------|
| Owner (Print) | Owner (Signature) | Date |
| General Contractor (Print) | General Contractor (Signature) | Date |
| Project Architect (Print) | Project Architect (Signature) | Date |
| Project Engineer (Print) | Project Engineer (Signature) | Date |

| | | |
|---------------------------------------|---|------|
| Testing Agency Company Name* | | |
| Testing Agency Representative (Print) | Testing Agency Representative (Signature) | Date |

| | | |
|---------------------------|-------------------------------|------|
| Building Official (Print) | Building Official (Signature) | Date |
|---------------------------|-------------------------------|------|

The special inspection/testing agency listed above must have a current Portfolio of Qualifications on file with the City of Bainbridge Island **prior to performing work.*

1703.1 Approved agency.

An approved agency shall provide all information as necessary for the Building Official to determine that the agency meets the applicable requirements.

SECTION 1704 SPECIAL INSPECTIONS, CONTRACTOR RESPONSIBILITY AND STRUCTURAL OBSERVATIONS

1704.1 General.

This section provides minimum requirements for special inspections, the statement of special inspections, contractor responsibility and structural observations.

Required Special Inspections 2015 International Building Code; Chapter 17:

A completed and signed copy of pages 1 through 3 of this form shall be submitted to this department prior to building permit approval. 2015 International Building Code; Chapter 17:

- 1. Structural Steel 1705.2.1
- 2. Cold form steel deck 1705.2.2
- 3. Open-web steel joists & girders 1705.2.3
- 4. Cold form steel trusses spanning 60 feet or greater 1705.2.4
- 5. Concrete construction 1705.3 & Table 1705.3
- 6. Shotcrete 1705.3
- 7. Welding of reinforcing bars 1705.3.1
- 8. Material Tests 1705.3.2
- 9. Masonry Construction 1705.4
- 10. Empirically designed masonry, glass unit & masonry in Risk Category IV 1705.4.1
- 11. Vertical masonry foundation elements 1705.4.2
- 12. Wood construction 1705.5
- 13. High Load Diaphragms 1705.5.1
- 14. Metal-plate connected wood trusses spanning 60 feet or greater 1705.5.2
- 15. Soils 1705.6 & Table 1705.6
- 16. Driven deep foundations 1705.7 & Table 1705.7
- 17. Cast in-place deep foundations 1705.8 & Table 1705.8
- 18. Special inspections for wind resistance 1705.11
- 19. Structural wood 1705.11.1
- 20. Special inspection for seismic resistance 1705.12
- 21. Special inspection for structural steel per 1705.12.1
- 22. Special inspection for structural wood per 1705.12.2
- 23. Special inspection for cold-formed steel per 1705.12.3

- 24. Designated seismic systems 1705.12.4
- 25. Architectural components 1705.12.5
- 26. Plumbing, mechanical & electrical components 1705.12.6
- 27. Storage racks 1705.12.7
- 28. Seismic isolation systems 1705.12.8
- 29. Cold-formed steel special bolted moment frames 1705.12.9
- 30. Testing for seismic resistance 1705.13
- 31. Sprayed fire-resistance materials 1705.14
- 32. Mastic & intusement fire-resistance costings 1705.15
- 33. Fire-resistance penetrations and joints 1705.17
- 34. Exterior insulation & finish systems (EIFS) 1705.16
- 35. SIP Panel Installations PER ESR-1882
- 36. Testing for smoke control 1705.18
- 37. Special inspection of fabricated items 1704.2.5
- 38. Submittals to the building official 1704.5
- 39. Structures over 75' in height located in Seismic Design Category D, 1704.6.1
- 40. Structures classified as Risk Category III or IV located in Seismic Design Category D, 1704.6.1

SECTION 1703 APPROVALS

1703.1 Approved Agency

An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements specified in Sections 1703.1.1 through 1703.1.3.

1703.1.1 Independence

An approved agency shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose to the building official and the registered design professional possible conflicts of interest so that objectivity can be confirmed.

1703.1.2 Equipment

An approved agency shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.

1703.1.3 Personnel

An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and special inspections.

1703.2 Written Approval

Any material, appliance, equipment, system or method of construction meeting the requirements of this code shall be approved in writing after satisfactory completion of the required tests and submission of required test reports.

1703.3 Record of Approval

For any material, appliance, equipment, system or method of construction that has been approved, a record of such approval, including the conditions and limitations of the approval, shall be kept on file in the building official's office and shall be available for public review at appropriate times.

1703.4 Performance

Specific information consisting of test reports conducted by an approved agency in accordance with the appropriate referenced standards, or other such information as necessary, shall be provided for the building official to determine that the product, material or assembly meets the applicable code requirements.

1703.4.1 Research and Investigation

Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any product, material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the building official shall approve the use of the product, material or assembly subject to the requirements of this code. The costs, reports and investigations required under these provisions shall be paid by the owner or the owner's authorized agent.

1703.4.2 Research Reports

Supporting data, where necessary to assist in the approval of products, materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

1703.5 Labeling

Products, materials or assemblies required to be labeled shall be labeled in accordance with the procedures set forth in Sections 1703.5.1 through 1703.5.4.

1703.5.1 Testing

An approved agency shall test a representative sample of the product, material or assembly being labeled to the relevant standard or standards. The approved agency shall maintain a record of the tests performed. The record shall provide sufficient detail to verify compliance with the test standard.

1703.5.2 Inspection and Identification

The approved agency shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be labeled. The inspection shall verify that the labeled product, material or assembly is representative of the product, material or assembly tested.

1703.5.3 Label Information

The label shall contain the manufacturer's identification, model number, serial number or definitive information describing the performance characteristics of the product, material or assembly and the approved agency's identification.

1703.5.4 Method of Labeling

Information required to be permanently identified on the product, material or assembly shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed.

1703.6 Evaluation and Follow-up Inspection Services

Where structural components or other items regulated by this code are not visible for inspection after completion of a prefabricated assembly, the owner or the owner's authorized agent shall submit a report of each prefabricated assembly. The report shall indicate the complete details of the assembly, including a description of the assembly and its components, the basis upon which the assembly is being evaluated, test results and similar information and other data as necessary for the building official to determine conformance to this code. Such a report shall be approved by the building official.

1703.6.1 Follow-up Inspection

The owner or the owner's authorized agent shall provide for special inspections of fabricated items in accordance with Section 1704.2.5.

1703.6.2 Test and Inspection Records

Copies of necessary test and special inspection records shall be filed with the building official.

SECTION 1704 SPECIAL INSPECTIONS AND TESTS, CONTRACTOR RESPONSIBILITY AND STRUCTURAL OBSERVATIONS

1704.1 General

Special inspections and tests, statements of special inspections, responsibilities of contractors, submittals to the building official, and structural observations shall meet the applicable requirements of this section.

1704.2 Special Inspections and Tests.

Where application is made to the building official for construction as specified in Section 105, the owner or the owner's authorized agent, other than the contractor, shall employ one or more approved agencies to provide special inspections and tests during construction on the types of work specified in Section 1705 and identify the approved agencies to the building official. These special inspections and tests are in addition to the inspections by the building official that are identified in Section 110.

Exceptions:

1. Special inspections and tests are not required for construction of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Unless otherwise required by the building official, special inspections and tests are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.
3. Special inspections and tests are not required for portions of

structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.7 or the conventional light-frame construction provisions of Section 2308.

4. The contractor is permitted to employ the approved agencies where the contractor is also the owner.

1704.2.1 Special Inspector Qualifications

Prior to the start of the construction, the approved agencies shall provide written documentation to the building official demonstrating the competence and relevant experience or training of the special inspectors who will perform the special inspections and tests during construction. Experience or training shall be considered relevant where the documented experience or training is related in complexity to the same type of special inspection or testing activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency and their personnel are permitted to act as special inspectors for the work designed by them, provided they qualify as special inspectors.

1704.2.2 Access for Special Inspection

The construction or work for which special inspection or testing is required shall remain accessible and exposed for special inspection or testing purposes until completion of the required special inspections or tests.

1704.2.3 Statement of Special Inspections

The applicant shall submit a statement of special inspections in accordance with Section 1704.1 as a condition for permit issuance. This statement shall be in accordance with Section 1704.3.

Exception:

1. A statement of special inspections is not required for portions of structures designed and constructed in accordance with the cold-formed steel light-frame construction provisions of Section 2211.7 or the conventional light-frame construction provisions of Section 2308.

1704.2.4 Report Requirement

Approved agencies shall keep records of special inspections and tests. The approved agency shall submit reports of special inspections and tests to the building official and to the registered design professional in responsible charge. Reports shall indicate that work inspected or tested was or was not completed in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work. A final report documenting required special inspections and tests, and correction of any discrepancies noted in the inspections or tests, shall be submitted at a point in time agreed upon prior to the start of work by the owner or the owner's authorized agent to the building official.

1704.2.5 Special Inspection of Fabricated

Items Where fabrication of structural, load-bearing or lateral load-resisting members or assemblies is being conducted on the premises of a fabricator's shop, special inspections of the fabricated items shall be performed during fabrication.

Exceptions:

1. Special inspections during fabrication are not required where the fabricator maintains approved detailed fabrication and quality control procedures that provide a basis for control of the workmanship and the fabricator's ability to conform to approved construction documents and this code. Approval shall be based upon review of fabrication and quality control procedures and periodic inspection of fabrication practices by the building official.
2. Special inspections are not required where the fabricator is registered and approved in accordance with Section 1704.2.5.1.

1704.2.5.1 Fabricator approval

Special inspections during fabrication are not required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved agency. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the owner or the owner's authorized agent for submittal to the building official as specified in Section 1704.5 stating that the work was performed in accordance with the approved construction documents.

1704.3 Statement of Special Inspections

Where special inspections or tests are required by Section 1705, the registered design professional in responsible charge shall prepare a statement of special inspections in accordance with Section 1704.3.1 for submittal by the applicant in accordance with Section 1704.2.3.

Exception:

1. The statement of special inspections is permitted to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional.

1704.3.1 Content of Statement of Special Inspections

The statement of special inspections shall identify the following:

1. The materials, systems, components and work required to have special inspections or tests by the building official or by the registered design professional responsible for each portion of the work.
2. The type and extent of each special inspection.
3. The type and extent of each test.
4. Additional requirements for special inspections or tests for seismic or wind resistance as specified in Sections 1705.11, 1705.12 and 1705.13.

5. For each type of special inspection, identification as to whether it will be continuous special inspection, periodic special inspection or performed in accordance with the notation used in the referenced standard where the inspections are defined.

1704.3.2 Seismic Requirements in the Statement of Special Inspections

Where Section 1705.12 or 1705.13 specifies special inspections or tests for seismic resistance, the statement of special inspections shall identify the designated seismic systems and seismic force resisting systems that are subject to the special inspections or tests.

1704.3.3 Wind Requirements in the Statement of Special Inspections

Where Section 1705.11 specifies special inspection for wind resistance, the statement of special inspections shall identify the main wind force-resisting systems and wind-resisting components that are subject to special inspections.

1704.4 Contractor Responsibility

Each contractor responsible for the construction of a main wind- or seismic force-resisting system, designated seismic system or a wind- or seismic force-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner or the owner's authorized agent prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain acknowledgment of awareness of the special requirements contained in the statement of special inspections.

1704.5 Submittals to the Building Official

In addition to the submittal of reports of special inspections and tests in accordance with Section 1704.2.4, reports and certificates shall be submitted by the owner or the owner's authorized agent to the building official for each of the following:

1. Certificates of compliance for the fabrication of structural, load-bearing or lateral load-resisting members or assemblies on the premises of a registered and approved fabricator in accordance with Section 1704.2.5.1.
2. Certificates of compliance for the seismic qualification of nonstructural components, supports and attachments in accordance with Section 1705.13.2.
3. Certificates of compliance for designated seismic systems in accordance with Section 1705.13.3.
4. Reports of preconstruction tests for shotcrete in accordance with Section 1908.5.
5. Certificates of compliance for open web steel joists and joist girders in accordance with Section 2207.5.
6. Reports of material properties verifying compliance with the requirements of AWS D1.4 for weldability as specified in Section 26.5.4 of ACI 318 for reinforcing bars in concrete complying with a standard other than ASTM A 706 that are to be welded; and

7. Reports of mill tests in accordance with Section 20.2.2.5 of ACI 318 for reinforcing bars complying with ASTM A 615 and used to resist earthquake-induced flexural or axial forces in the special moment frames, special structural walls or coupling beams connecting special structural walls of seismic force-resisting systems in structures assigned to Seismic Design Category B, C, D, E or F.

1704.6 Structural Observations

Where required by the provisions of Section 1704.6.1 or 1704.6.2, the owner or the owner's authorized agent shall employ a registered design professional to perform structural observations. Structural observation does not include or waive the responsibility for the inspections in Section 110 or the special inspections in Section 1705 or other sections of this code.

Prior to the commencement of observations, the structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations. At the conclusion of the work included in the permit, the structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies that, to the best of the structural observer's knowledge, have not been resolved.

1704.6.1 Structural Observations for Seismic

Resistance Structural observations shall be provided for those structures assigned to Seismic Design Category D, E or F where one or more of the following conditions exist:

1. The structure is classified as Risk Category III or IV.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base as defined in ASCE 7.
3. The structure is assigned to Seismic Design Category E, is classified as Risk Category I or II, and is greater than two stories above grade plane.
4. When so designated by the registered design professional responsible for the structural design.
5. When such observation is specifically required by the building official.

1704.6.2 Structural Observations for Wind Requirements

Structural observations shall be provided for those structures sited where V_{asd} as determined in accordance with Section 1609.3.1 exceeds 110 mph (49 m/sec), where one or more of the following conditions exist:

1. The structure is classified as Risk Category III or IV.
2. The building height is greater than 75 feet (22 860 mm).
3. When so designated by the registered design professional responsible for the structural design.
4. When such observation is specifically required by the building official.

SECTION 1705 REQUIRED SPECIAL INSPECTIONS AND TESTS

1705.1 General

Special inspections and tests of elements and nonstructural components of buildings and structures shall meet the applicable requirements of this section.

1705.1.1 Special Cases

Special inspections and tests shall be required for proposed work that is, in the opinion of the building official, unusual in its nature, such as, but not limited to, the following examples:

1. Construction materials and systems that 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.

See list of special inspections and tests of elements and nonstructural components of the buildings and elements on pages 3 and 4 of this document.

TABLE 1705.2.3
REQUIRED SPECIAL INSPECTIONS OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS

| TYPE | CONTINUOUS SPECIAL INSPECTION | PERIODIC SPECIAL INSPECTION | REFERENCED STANDARD ^a |
|--|-------------------------------------|-----------------------------------|--|
| 1. Installation of open-web steel joists and joist girders. | | | |
| a. End connections – welding or bolted. | — | X | SJI specifications listed in Section 2207.1. |
| b. Bridging – horizontal or diagonal. | — | | |
| 1. Standard bridging. | — | X | SJI specifications listed in Section 2207.1. |
| 2. Bridging that differs from the SJI specifications listed in Section 2207.1. | | X | |

For SI: 1 inch = 25.4 mm.

^a Where applicable, see also Section 1705.12, Special inspections for seismic resistance.

1705.2.4 Cold-formed steel trusses spanning 60 feet or greater.

Where a cold-formed steel truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

1705.3 Concrete construction.

Special inspections and tests of concrete construction shall be performed in accordance with this section and Table 1705.3.

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

1. Isolated spread concrete footings of buildings three stories or less above *grade plane* that are fully supported on earth or rock.
2. Continuous concrete footings supporting walls of buildings three stories or less above *grade plane* that are fully supported on earth or rock where:
 - 2.1. The footings support walls of light-frame construction.
 - 2.2. The footings are designed in accordance with Table 1809.7.
 - 2.3. The structural design of the footing is based on a specified compressive strength, f_c , not more than 2,500 pounds per square inch (psi) (17.2 MPa), regardless of the compressive strength specified in the *approved construction documents* or used in the footing construction.
3. 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 (1.03 MPa).
4. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.
5. Concrete patios, driveways and sidewalks, on grade.

TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

| TYPE | CONTINUOUS SPECIAL INSPECTION | PERIODIC SPECIAL INSPECTION | REFERENCED STANDARD ^a | IBC REFERENCE |
|--|-------------------------------|-----------------------------|---|--------------------------------|
| 1. Inspect reinforcement, including prestressing tendons, and verify placement. | — | X | ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3 | 1908.4 |
| 2. Reinforcing bar welding: a. Verify weldability of reinforcing bars other than ASTM A706; b. Inspect single-pass fillet welds, maximum 5/16"; and c. Inspect all other welds. | — X | X X | AWS D1.4 ACI 318: 26.6.4 | — |
| 3. Inspect anchors cast in concrete. | — | X | ACI 318: 17.8.2 | — |
| 4. Inspect anchors post-installed in hardened concrete members. ^b a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads. b. Mechanical anchors and adhesive anchors not defined in 4.a. | X | X | ACI 318: 17.8.2.4 ACI 318: 17.8.2 | — |
| 5. Verify use of required design mix. | — | X | ACI 318: Ch. 19, 26.4.3, 26.4.4 | 1904.1, 1904.2, 1908.2, 1908.3 |
| 6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete. | X | — | ASTM C172 ASTM C31 ACI 318: 26.4, 26.12 | 1908.10 |
| 7. Inspect concrete and shotcrete placement for proper application techniques. | X | — | ACI 318: 26.5 | 1908.6, 1908.7, 1908.8 |
| 8. Verify maintenance of specified curing temperature and techniques. | — | X | ACI 318: 26.5.3-26.5.5 | 1908.9 |
| 9. Inspect prestressed concrete for: a. Application of prestressing forces; and b. Grouting of bonded prestressing tendons. | X X | — — | ACI 318: 26.10 | — |
| 10. Inspect erection of precast concrete members. | — | X | ACI 318: Ch. 26.8 | — |
| 11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs. | — | X | ACI 318: 26.11.2 | — |
| 12. Inspect formwork for shape, location and dimensions of the concrete member being formed. | — | X | ACI 318: 26.11.1.2(b) | — |

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1705.12, Special inspections for seismic resistance.

b. Specific requirements for special inspection shall be included in the research report for the anchor issued by an approved source in accordance with 17.8.2 in ACI 318, or other qualification procedures. Where specific requirements are not provided, special inspection requirements shall be specified by the registered design professional and shall be approved by the building official prior to the commencement of the work.

1705.3.1 Welding of reinforcing bars.

Special inspections of welding and qualifications of special inspectors for reinforcing bars shall be in accordance with the requirements of AWS D1.4 for special inspection and of AWS D1.4 for special inspector qualification.

1705.3.2 Material tests.

In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapters 19 and 20 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapters 19 and 20 of ACI 318.

1705.4 Masonry construction.

Special inspections and tests of masonry construction shall be performed in accordance with the quality assurance program requirements of TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6.

Exception: Special inspections and tests shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed in accordance with Section 2109, 2110 or Chapter 14, respectively, where they are part of a structure classified as Risk Category I, II or III.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

1705.4.1 Empirically designed masonry, glass unit masonry and masonry veneer in Risk Category IV.

Special inspections and tests for empirically designed masonry, glass unit masonry or masonry veneer designed in accordance with Section 2109, 2110 or Chapter 14, respectively, where they are part of a structure classified as Risk Category IV shall be performed in accordance with TMS 402/ACI 530/ASCE 5, Level B Quality Assurance.

1705.4.2 Vertical masonry foundation elements.

Special inspections and tests of vertical masonry foundation elements shall be performed in accordance with Section 1705.4.

1705.5 Wood construction.

Special inspections of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.5. Special inspections of site-built assemblies shall be in accordance with this section.

1705.5.1 High-load diaphragms.

High-load diaphragms designed in accordance with Section 2306.2 shall be installed with special inspections as indicated in Section 1704.2. The special inspector shall inspect the wood structural panel sheathing to ascertain whether it is of the grade and thickness shown on the approved construction documents. Additionally, the special inspector must verify the nominal size of framing members at adjoining panel edges, the nail or staple diameter and length, the number of fastener lines and that the spacing between fasteners in each line and at edge margins agrees with the approved construction documents.

1705.5.2 Metal-plate-connected wood trusses spanning 60 feet or greater.

Where a truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.

1705.6 Soils.

Special inspections and tests of existing site soil conditions, fill placement and load-bearing requirements shall be performed in accordance with this section and Table 1705.6. The approved geotechnical report and the construction documents prepared by the registered design professionals shall be used to determine compliance. During fill placement, the special inspector shall verify that proper materials and procedures are used in accordance with the provisions of the approved geotechnical report.

Exception: Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the 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.

**TABLE 1705.6
REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS**

| TYPE | CONTINUOUS SPECIAL INSPECTION | PERIODIC SPECIAL INSPECTION |
|--|-------------------------------|-----------------------------|
| 1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity. | — | X |
| 2. Verify excavations are extended to proper depth and have reached proper material. | — | X |
| 3. Perform classification and testing of compacted fill materials. | — | X |
| 4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill. | X | — |
| 5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly. | — | X |

1705.7 Driven deep foundations.

Special inspections and tests shall be performed during installation of driven deep foundation elements as specified in Table 1705.7. The approved geotechnical report and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance.

**TABLE 1705.7
REQUIRED SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP FOUNDATION ELEMENTS**

| TYPE | CONTINUOUS SPECIAL INSPECTION | PERIODIC SPECIAL INSPECTION |
|---|-------------------------------|-----------------------------|
| 1. Verify element materials, sizes and lengths comply with the requirements. | X | — |
| 2. Determine capacities of test elements and conduct additional load tests, as required. | X | — |
| 3. Inspect driving operations and maintain complete and accurate records for each element. | X | — |
| 4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element. | X | — |
| 5. For steel elements, perform additional special inspections in accordance with Section 1705.2. | — | — |
| 6. For concrete elements and concrete-filled elements, perform tests and additional special inspections in accordance with Section 1705.3. | — | — |
| 7. For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge. | — | — |

1705.8 Cast-in-place deep foundations.

Special inspections and tests shall be performed during installation of cast-in-place deep foundation elements as specified in Table 1705.8. The approved geotechnical report and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance.

**TABLE 1705.8
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS**

| TYPE | CONTINUOUS SPECIAL INSPECTION | PERIODIC SPECIAL INSPECTION |
|---|-------------------------------|-----------------------------|
| 1. Inspect drilling operations and maintain complete and accurate records for each element. | X | — |
| 2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end-bearing strata capacity. Record concrete or grout volumes. | X | — |
| 3. For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3. | — | — |

1705.9 Helical pile foundations.

Continuous special inspections shall be performed during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the *registered design professional in responsible charge*. The approved geotechnical report and the *construction documents* prepared by the *registered design professional* shall be used to determine compliance.

1705.10 Fabricated items.

Special inspections of fabricated items shall be performed in accordance with Section 1704.2.5.

1705.11 Special inspections for wind resistance.

Special inspections for wind resistance specified in Sections 1705.11.1 through 1705.11.3, unless exempted by the exceptions to Section 1704.2, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where V_{ASD} as determined in accordance with Section 1609.3.1 is 120 miles per hour (52.8 m/sec) or greater.
2. In wind Exposure Category C or D, where V_{ASD} as determined in accordance with Section 1609.3.1 is 110 mph (49 m/sec) or greater.

1705.11.1 Structural wood.

Continuous special inspection is required during field gluing operations of elements of the main windforce-resisting system. *Periodic special inspection* is required for nailing, bolting, anchoring and other fastening of elements of the main windforce-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

Exception: *Special inspections* are not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other elements of the main windforce-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

1705.11.2 Cold-formed steel light-frame construction.

Periodic special inspection is required for welding operations of elements of the main windforce-resisting system. *Periodic special inspection* is required for screw attachment, bolting, anchoring and other fastening of elements of the main windforce-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: *Special inspections* are not required for cold-formed steel light-frame shear walls and diaphragms, including screwing, bolting, anchoring and other fastening to components of the windforce-resisting system, where either of the following applies:

- 1.The sheathing is gypsum board or fiberboard.
- 2.The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

1705.11.3 Wind-resisting components.

Periodic special inspection is required for fastening of the following systems and components:

- 1.Roof covering, roof deck and roof framing connections.
- 2.Exterior wall covering and wall connections to roof and floor diaphragms and framing.

1705.12 Special inspections for seismic resistance.

Special inspections for seismic resistance shall be required as specified in Sections 1705.12.1 through 1705.12.9, unless exempted by the exceptions of Section 1704.2.

Exception: The *special inspections* specified in Sections 1705.12.1 through 1705.12.9 are not required for structures designed and constructed in accordance with one of the following:

- 1.The structure consists of light-frame construction; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.3.4, does not exceed 0.5; and the *building height* of the structure does not exceed 35 feet (10 668 mm).
- 2.The seismic force-resisting system of the structure consists of reinforced masonry or reinforced concrete; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.3.4, does not exceed 0.5; and the *building height* of the structure does not exceed 25 feet (7620 mm).
- 3.The structure is a detached one- or two-family dwelling not exceeding two *stories above grade plane* and does not have any of the following horizontal or vertical irregularities in accordance with Section 12.3 of ASCE 7:
 - 3.1.Torsional or extreme torsional irregularity.
 - 3.2.Nonparallel systems irregularity.
 - 3.3.Stiffness-soft story or stiffness-extreme soft story irregularity.
 - 3.4.Discontinuity in lateral strength-weak story irregularity.

1705.12.1 Structural steel.

Special inspections for seismic resistance shall be in accordance with Section 1705.12.1.1 or 1705.12.1.2, as applicable.

1705.12.1.1 Seismic force-resisting systems.

Special inspections of structural steel in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category* B, C, D, E or F shall be performed in accordance with the quality assurance requirements of AISC 341.

Exception: *Special inspections* are not required in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category* B or C that are not specifically detailed for seismic resistance, with a response modification coefficient, R , of 3 or less, excluding cantilever column systems.

1705.12.1.2 Structural steel elements.

Special inspections of structural steel elements in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category* B, C, D, E or F other than those covered in Section 1705.12.1.1, including struts, collectors, chords and foundation elements, shall be performed in accordance with the quality assurance requirements of AISC 341.

Exception: *Special inspections of structural steel elements* are not required in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category* B or C with a response modification coefficient, R , of 3 or less.

1705.12.2 Structural wood.

For the seismic force-resisting systems of structures assigned to *Seismic Design Category* C, D, E or F:

- 1.*Continuous special inspection* shall be required during field gluing operations of elements of the seismic force-resisting system.
- 2.*Periodic special inspection* shall be required for nailing, bolting, anchoring and other fastening of elements of the seismic force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.

Exception: *Special inspections* are 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 fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

1705.12.3 Cold-formed steel light-frame construction.

For the seismic force-resisting systems of structures assigned to *Seismic Design Category C, D, E or F*, periodic special inspection shall be required:

1. For welding operations of elements of the seismic force-resisting system; and
2. For screw attachment, bolting, anchoring and other fastening of elements of the seismic force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: *Special inspections* are not required for cold-formed steel light-frame shear walls and diaphragms, including screw installation, bolting, anchoring and other fastening to components of the seismic force-resisting system, where either of the following applies:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

1705.12.4 Designated seismic systems.

For structures assigned to *Seismic Design Category C, D, E or F*, the special inspector shall examine *designated seismic systems* requiring seismic qualification in accordance with Section 13.2.2 of ASCE 7 and verify that the label, anchorage and mounting conform to the *certificate of compliance*.

1705.12.5 Architectural components.

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 D, E or F*.

Exception: *Periodic special inspection* is not required for the following:

1. Exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer 30 feet (9144 mm) or less in height above grade or walking surface.
2. Exterior cladding and interior and exterior veneer weighing 5 psf (24.5 N/m²) or less.
3. Interior nonbearing walls weighing 15 psf (73.5 N/m²) or less.

1705.12.5.1 Access floors.

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

1705.12.6 Plumbing, mechanical and electrical components.

Periodic special inspection of plumbing, mechanical and electrical components shall be required for the following:

1. Anchorage of electrical equipment for emergency and standby power systems in structures assigned to *Seismic Design Category C, D, E or F*.
2. Anchorage of other electrical equipment in structures assigned to *Seismic Design Category E or F*.
3. Installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to *Seismic Design Category C, D, E or F*.
4. Installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to *Seismic Design Category C, D, E or F*.
5. Installation and anchorage of vibration isolation systems in structures assigned to *Seismic Design Category C, D, E or F* where the *approved construction documents* require a nominal clearance of $\frac{1}{4}$ inch (6.4 mm) or less between the equipment support frame and restraint.

1705.12.7 Storage racks.

Periodic special inspection is required for the anchorage of storage racks that are 8 feet (2438 mm) or greater in height in structures assigned to *Seismic Design Category D, E or F*.

1705.12.8 Seismic isolation systems.

Periodic special inspection shall be provided for seismic isolation systems in seismically isolated structures assigned to *Seismic Design Category B, C, D, E or F* during the fabrication and installation of isolator units and energy dissipation devices.

1705.12.9 Cold-formed steel special bolted moment frames.

Periodic special inspection shall be provided for the installation of cold-formed steel special bolted moment frames in the *seismic force-resisting systems* of structures assigned to *Seismic Design Category D, E or F*.

1705.13 Testing for seismic resistance.

Testing for seismic resistance shall be required as specified in Sections 1705.13.1 through 1705.13.4, unless exempted from *special inspections* by the exceptions of Section 1704.2.

1705.13.1 Structural steel.

Nondestructive testing for seismic resistance shall be in accordance with Section 1705.13.1.1 or 1705.13.1.2, as applicable.

1705.13.1.1 Seismic force-resisting systems.

Nondestructive testing of structural steel in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category B, C, D, E or F* shall be performed in accordance with the quality assurance requirements of AISC 341.

Exception: Nondestructive testing is not required in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category B or C* that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

1705.13.1.2 Structural steel elements.

Nondestructive testing of structural steel elements in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category B, C, D, E or F* other than those covered in Section 1705.13.1.1, including struts, collectors, chords and foundation elements, shall be performed in accordance with the quality assurance requirements of AISC 341.

Exception: Nondestructive testing of *structural steel elements* is not required in the seismic force-resisting systems of buildings and structures assigned to *Seismic Design Category B or C* with a response modification coefficient, *R*, of 3 or less.

1705.13.2 Nonstructural components.

For structures assigned to *Seismic Design Category* B, C, D, E or F, where the requirements of Section 13.2.1 of ASCE 7 for nonstructural components, supports or attachments are met by seismic qualification as specified in Item 2 therein, the *registered design professional* shall specify on the *approved construction documents* the requirements for seismic qualification by analysis, testing or experience data. *Certificates of compliance* for the seismic qualification shall be submitted to the *building official* as specified in Section 1704.5.

1705.13.3 Designated seismic systems.

For structures assigned to *Seismic Design Category* C, D, E or F and with *designated seismic systems* that are subject to the requirements of Section 13.2.2 of ASCE 7 for certification, the *registered design professional* shall specify on the *approved construction documents* the requirements to be met by analysis, testing or experience data as specified therein. *Certificates of compliance* documenting that the requirements are met shall be submitted to the *building official* as specified in Section 1704.5.

1705.13.4 Seismic isolation systems.

Seismic isolation systems in seismically isolated structures assigned to *Seismic Design Category* B, C, D, E or F shall be tested in accordance with Section 17.8 of ASCE 7.

[BF] 1705.14 Sprayed fire-resistant materials.

Special inspections and tests of sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be performed in accordance with Sections 1705.14.1 through 1705.14.6. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* and tests shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.

[BF] 1705.14.1 Physical and visual tests.

The *special inspections* and tests shall include the following to demonstrate compliance with the listing and the *fire-resistance rating*:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (kg/m³).
4. Bond strength adhesion/cohesion.
5. Condition of finished application.

[BF] 1705.14.2 Structural member surface conditions.

The surfaces shall be prepared in accordance with the *approved* fire-resistance design and the written instructions of *approved* manufacturers. The prepared surface of structural members to be sprayed shall be inspected by the special inspector before the application of the sprayed fire-resistant material.

[BF] 1705.14.3 Application.

The substrate shall have a minimum ambient temperature before and after application as specified in the written instructions of *approved* manufacturers. The area for application shall be ventilated during and after application as required by the written instructions of *approved* manufacturers.

[BF] 1705.14.4 Thickness.

No more than 10 percent of the thickness measurements of the sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be less than the thickness required by the *approved* fire-resistance design, but in no case less than the minimum allowable thickness required by Section 1705.14.4.1.

[BF] 1705.14.4.1 Minimum allowable thickness.

For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus $\frac{1}{4}$ inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1705.14.4.2 and 1705.14.4.3.

[BF] 1705.14.4.2 Floor, roof and wall assemblies.

The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E605, making not less than four measurements for each 1,000 square feet (93 m²) of the sprayed area, or portion thereof, in each *story*.

[BF] 1705.14.4.3 Cellular decks.

Thickness measurements shall be selected from a square area, 12 inches by 12 inches (305 mm by 305 mm) in size. A minimum of four measurements shall be made, located symmetrically within the square area.

[BF] 1705.14.4.4 Fluted decks.

Thickness measurements shall be selected from a square area, 12 inches by 12 inches (305 mm by 305 mm) in size. A minimum of four measurements shall be made, located symmetrically within the square area, including one each of the following: valley, crest and sides. The average of the measurements shall be reported.

[BF] 1705.14.4.5 Structural members.

The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

[BF] 1705.14.4.6 Beams and girders.

At beams and girders thickness measurements shall be made at nine locations around the beam or girder at each end of a 12-inch (305 mm) length.

[BF] 1705.14.4.7 Joists and trusses.

At joists and trusses, thickness measurements shall be made at seven locations around the joist or truss at each end of a 12-inch (305 mm) length.

[BF] 1705.14.4.8 Wide-flanged columns.

At wide-flanged columns, thickness measurements shall be made at 12 locations around the column at each end of a 12-inch (305 mm) length.

[BF] 1705.14.4.9 Hollow structural section and pipe columns.

At hollow structural section and pipe columns, thickness measurements shall be made at a minimum of four locations around the column at each end of a 12-inch (305 mm) length.

[BF] 1705.14.5 Density.

The density of the sprayed fire-resistant material shall not be less than the density specified in the *approved* fire-resistance design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E605. The test samples for determining the density of the sprayed fire-resistant materials shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) or portion thereof of the sprayed area in each *story*.
2. From beams, girders, trusses and columns at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m²) of floor area or portion thereof in each *story*.

[BF] 1705.14.6 Bond strength.

The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to floor, roof and wall assemblies and structural members shall not be less than 150 pounds per square foot (psf) (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1705.14.6.1 through 1705.14.6.3.

[BF] 1705.14.6.1 Floor, roof and wall assemblies.

The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) of the sprayed area, or portion thereof, in each *story*.

[BF] 1705.14.6.2 Structural members.

The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of structural member for each 2,500 square feet (232 m²) of floor area or portion thereof in each *story*.

[BF] 1705.14.6.3 Primer, paint and encapsulant bond tests.

Bond tests to qualify a primer, paint or encapsulant shall be conducted when the sprayed fire-resistant material is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire-resistant material has not been determined. A bonding agent *approved* by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.

[BF] 1705.15 Mastic and intumescent fire-resistant coatings.

Special inspections and tests for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be performed in accordance with AWCI 12-B. *Special inspections* and tests shall be based on the fire-resistance design as designated in the *approved construction documents*.

1705.16 Exterior insulation and finish systems (EIFS).

Special inspections shall be required for all EIFS applications.

Exceptions:

1. *Special inspections* shall not be required for EIFS applications installed over a *water-resistive barrier* with a means of draining moisture to the exterior.
2. *Special inspections* shall not be required for EIFS applications installed over masonry or concrete walls.

1705.16.1 Water-resistive barrier coating.

A *water-resistive barrier* coating complying with ASTM E2570 requires *special inspection* of the *water-resistive barrier* coating when installed over a sheathing substrate.

[BF] 1705.17 Fire-resistant penetrations and joints.

In *high-rise buildings* or in buildings assigned to *Risk Category III* or *IV*, *special inspections* for *through-penetrations*, membrane penetration firestops, *fire-resistant joint systems* and perimeter fire barrier systems that are tested and *listed* in accordance with Sections 714.3.1.2, 714.4.2, 715.3 and 715.4 shall be in accordance with Section 1705.17.1 or 1705.17.2.

[BF] 1705.17.1 Penetration firestops.

Inspections of penetration firestop systems that are tested and *listed* in accordance with Sections 714.3.1.2 and 714.4.2 shall be conducted by an *approved agency* in accordance with ASTM E2174.

[BF] 1705.17.2 Fire-resistant joint systems.

Inspection of fire-resistant joint systems that are tested and *listed* in accordance with Sections 715.3 and 715.4 shall be conducted by an *approved agency* in accordance with ASTM E2393.

[F] 1705.18 Testing for smoke control.

Smoke control systems shall be tested by a special inspector.

[F] 1705.18.1 Testing scope.

The test scope shall be as follows:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements and detection and control verification.

[F] 1705.18.2 Qualifications.

Approved agencies for smoke control testing shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

**SECTION 1706
DESIGN STRENGTHS OF MATERIALS**

1706.1 Conformance to standards.

The design strengths and permissible stresses of any structural material that are identified by a manufacturer's designation as to manufacture and grade by mill tests, or the strength and stress grade is otherwise confirmed to the satisfaction of the *building official*, shall conform to the specifications and methods of design of accepted engineering practice or the *approved* rules in the absence of applicable standards.

1706.2 New materials.

For materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests as provided for in Section 1707.

**SECTION 1707
ALTERNATIVE TEST PROCEDURE**

1707.1 General.

In the absence of *approved* rules or other *approved* standards, the *building official* shall make, or cause to be made, the necessary tests and investigations; or the *building official* shall accept duly authenticated reports from *approved agencies* in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.11. The cost of all tests and other investigations required under the provisions of this code shall be borne by the owner or the owner's authorized agent.

**SECTION 1708
IN-SITU LOAD TESTS**

1708.1 General.

Whenever there is a reasonable doubt as to the stability or load-bearing capacity of a completed building, structure or portion thereof for the expected loads, an engineering assessment shall be required. The engineering assessment shall involve either a structural analysis or an in-situ load test, or both. The structural analysis shall be based on actual material properties and other as-built conditions that affect stability or load-bearing capacity, and shall be conducted in accordance with the applicable design standard. If the structural assessment determines that the load-bearing capacity is less than that required by the code, load tests shall be conducted in accordance with Section 1708.2. If the building, structure or portion thereof is found to have inadequate stability or load-bearing capacity for the expected loads, modifications to ensure structural adequacy or the removal of the inadequate construction shall be required.

1708.2 Test standards.

Structural components and assemblies shall be tested in accordance with the appropriate referenced standards. In the absence of a standard that contains an applicable load test procedure, the test procedure shall be developed by a *registered design professional* and *approved*. The test procedure shall simulate loads and conditions of application that the completed structure or portion thereof will be subjected to in normal use.

1708.3 In-situ load tests.

In-situ load tests shall be conducted in accordance with Section 1708.3.1 or 1708.3.2 and shall be supervised by a *registered design professional*. The test shall simulate the applicable loading conditions specified in Chapter 16 as necessary to address the concerns regarding structural stability of the building, structure or portion thereof.

1708.3.1 Load test procedure specified.

Where a referenced standard contains an applicable load test procedure and acceptance criteria, the test procedure and acceptance criteria in the standard shall apply. In the absence of specific load factors or acceptance criteria, the load factors and acceptance criteria in Section 1708.3.2 shall apply.

1708.3.2 Load test procedure not specified.

In the absence of applicable load test procedures contained within a standard referenced by this code or acceptance criteria for a specific material or method of construction, such *existing structure* shall be subjected to a test procedure developed by a *registered design professional* that simulates applicable loading and deformation conditions. For components that are not a part of the seismic force-resisting system, at a minimum the test load shall be equal to the specified factored design loads. For materials such as wood that have strengths that are dependent on load duration, the test load shall be adjusted to account for the difference in load duration of the test compared to the expected duration of the design loads being considered. For statically loaded components, the test load shall be left in place for a period of 24 hours. For components that carry dynamic loads (e.g., machine supports or fall arrest anchors), the load shall be left in place for a period consistent with the component's actual function. The structure shall be considered to have successfully met the test requirements where the following criteria are satisfied:

1. Under the design load, the deflection shall not exceed the limitations specified in Section 1604.3.
2. Within 24 hours after removal of the test load, the structure shall have recovered not less than 75 percent of the maximum deflection.
3. During and immediately after the test, the structure shall not show evidence of failure.