



SPEAKING IN CODE



Statement of Special Inspections Guide

ACCORDING TO IBC 2015

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Engineering Stability Since 1881



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This “Statement of Special Inspections Guide” contains the interpretations and opinions of the author and is intended to be a general guide for individuals who are responsible for preparing the STATEMENT OF SPECIAL INSPECTIONS required by the International Building Code (IBC), section 1704. This document is simply a guide and should not be considered complete or be used as a stand-alone document that is incorporated into the contract documents. A thorough review of the code requirements set forth by IBC and IBC reference codes and standards should be performed by the Registered Design Professional in Responsible Charge prior to developing a project specific STATEMENT OF SPECIAL INSPECTIONS. The author of this document is not liable or responsible for any errors or omissions that may be found within this document.



General Special Inspection Definitions

Essential Facility

These are buildings that are considered to be essential in that their continuous use is needed, particularly in response to disasters. The phrase “designated as essential facilities” refers to designation by the building official that certain facilities are required for emergency response or disaster recovery. IBC Chapter 16, Table 1604.5 “*Risk Category of Buildings and Other Structures*”, category IV lists some building types deemed essential facilities.

Structural Observations

The visual observation of the structural system by a registered design professional for general conformance to the approved construction documents. Structural observations **are not** special inspections. *(Definition is located in chapter 2 of the IBC code book)*

Special Inspections

Inspection and testing of construction requiring the expertise of an approved special inspector in order to ensure compliance with this code (IBC) and the approved construction documents. *(Definition is located in chapter 2 of the IBC code book)*

Continuous Special Inspection

Special inspection by the special inspector who is present when and where the work to be inspected is being performed or installed. *(Definition is located in chapter 2 of the IBC code book)*

Periodic Special Inspection

Special inspection by the special inspector who is intermittently present where the work to be inspected has been or is being performed or installed. *(Definition is located in chapter 2 of the IBC code book)*

Observe

Observe these items on a random basis. Operations need not be delayed pending these inspections. *(Definition is located in AISC 360, Chapter N, Section N5, #4)*

Perform

Perform these tasks for each welded joint or member. *(Definition is located in AISC-360, Chapter N, and Section N5, #4)*



A. Structural Steel - Welding Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

STEEL INSPECTION <u>PRIOR TO</u> WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE		
IBC 1705.2.1, AISC 360-10: Table C-N5.4-1		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Verify that the welding procedures specification (WPS) is available	PERFORM	
2. Verify manufacturer certifications for welding consumables are available	PERFORM	
3. Verify material identification	PERFORM	Type and grade
4. Welder Identification System	PERFORM	The fabricator or erector, as applicable, shall maintain a system by which a welder who has welded a joint or member can be identified. Stamps, if used, shall be the low-stress type.
5. Fit-up of groove welds (including joint geometry)	OBSERVE	<ul style="list-style-type: none"> ✓ Joint preparation ✓ Dimensions (alignment, root opening, root face, bevel) ✓ Cleanliness (condition of steel surfaces) ✓ Tacking (tack weld quality and location) ✓ Backing type and fit (if applicable)
6. Configuration and finish of access holes	OBSERVE	
7. Fit-up of fillet welds	OBSERVE	<ul style="list-style-type: none"> ✓ Dimensions (alignment, gaps at root) ✓ Cleanliness (condition of steel surfaces) ✓ Tacking (tack weld quality and location)
STEEL INSPECTION <u>DURING</u> WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE		
IBC 1705.2.1, AISC 360-10: Table C-N5.4-2		
TASK	INSPECTION TYPE ¹	DESCRIPTION
8. Use of qualified welders	PERFORM	Welding by welders, welding operators, and tack welders who are qualified in accordance with code requirements.
9. Control and handling of welding consumables	OBSERVE	<ul style="list-style-type: none"> ✓ Packaging ✓ Electrode atmospheric exposure control
10. No welding over cracked tack welds	OBSERVE	
11. Environmental conditions	OBSERVE	<ul style="list-style-type: none"> ✓ Wind speed within limits ✓ Precipitation and temperature
12. Welding Procedure Specification followed	OBSERVE	<ul style="list-style-type: none"> ✓ Settings on welding equipment ✓ Travel speed ✓ Selected welding materials ✓ Shielding gas type/flow rate ✓ Preheat applied ✓ Interpass temperature maintained (min./max.) ✓ Proper position (F, H, V, OH) ✓ Intermix of filler metals avoided
13. Welding techniques	OBSERVE	<ul style="list-style-type: none"> ✓ Interpass and final cleaning ✓ Each pass within profile limitations ✓ Each pass meets quality requirements

¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.

OBSERVE: Observe the items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



A. Structural Steel - Welding Section (continued)

THIS SECTION APPLICABLE IF BOX IS CHECKED:

STEEL INSPECTION <u>AFTER</u> WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table C-N5.4-1		
TASK	INSPECTION TYPE ¹	DESCRIPTION
14. Welds cleaned	OBSERVE	
15. Size, length, and location of all welds	PERFORM	Size, length, and location of all welds conform to the requirements of the detail drawings.
16. Welds meet visual acceptance criteria	PERFORM AND DOCUMENT	<ul style="list-style-type: none"> ✓ Crack prohibition ✓ Weld/base-metal fusion ✓ Crater cross-section ✓ Weld profiles ✓ Weld size ✓ Undercut ✓ Porosity
17. Arc strikes, removed and ground flush	PERFORM	
18. k-area	PERFORM	When welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks
19. Backing removed, weld tabs removed and finished, and fillet welds added where required	PERFORM	
20. Repair activities	PERFORM	
21. Document acceptance or rejection of welded joint or member	PERFORM	

END SECTION

- ¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe the items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



B. Structural Steel - Bolting Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

STEEL INSPECTION <u>PRIOR TO BOLTING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE		
IBC 1705.2.1, AISC 360-10: Table C-N5.6-1		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Manufacturer's certifications available for fastener materials	PERFORM	
2. Fasteners marked in accordance with ASTM requirements	OBSERVE	
3. Proper fasteners selected for joint detail (grade, type, bolt length if threads are to be excluded from shear plane)	OBSERVE	
4. Proper bolting procedure selected for joint detail	OBSERVE	
5. Connecting elements, including appropriate faying surface condition and hole preparation, if specified, meet applicable requirements	OBSERVE	
6. Proper storage provided for bolts, nuts, washers, and other fastener components	OBSERVE	
STEEL INSPECTION TASKS <u>DURING BOLTING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE		
IBC 1705.2.1, AISC 360-10: Table C-N5.6-2		
TASK	INSPECTION TYPE ¹	DESCRIPTION
7. Fastener assemblies of suitable condition, placed in all holes and washers (if required) are positioned as required	OBSERVE	
8. Joint brought to the snug-tight condition prior to pretensioning operation	OBSERVE	
9. Fastener component not turned by the wrench prevented from rotating	OBSERVE	
10. Bolts are pretensioned in accordance with RCSC Specification, progressing systematically from the most rigid point toward the free edges.	OBSERVE	
STEEL INSPECTION TASKS <u>AFTER BOLTING</u> – VERIFY THE FOLLOWING ARE IN COMPLIANCE		
IBC 1705.2.1, AISC 360-10: Table C-N5.6-3		
TASK	INSPECTION TYPE ¹	DESCRIPTION
11. Document acceptance or rejection of all bolted connections		

END SECTION

- ¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe the items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



C. Structural Steel - Non Destructive Testing Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

NON DESTRUCTIVE TESTING OF WELDED JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Section N5.5		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Use of qualified nondestructive testing personnel	PERFORM AWS D1.1	Visual weld inspection and nondestructive testing (NDT) shall be conducted by personnel qualified in accordance with AWS D1.1.
2. CJP groove welds	OBSERVE AISC 360, Chap N, section 5b.	[NOTE: RDP must delete this row if section D (SEISMIC PROVISIONS SECTION) is checked] For structures in Risk Category III or IV of IBC Table 1604.5, UT shall be performed by QA on all (100%) CJP groove welds subject to transversely applied tension loading in butt, T- and corner joints, in materials 5/16" thick or greater. For structures in Risk Category II, UT shall be performed by QA on 10% of CJP groove welds in materials 5/16" thick or greater.
3. Welded joints subject to fatigue	OBSERVE AISC 360, Chap N, section 5d.	When required by Appendix 3, Table A-3.1, welded joints requiring weld soundness to be established by radiographic or ultrasonic inspection shall be tested by QA as prescribed.
4. Weld tab removal sites	OBSERVE AISC 360, Chap N, sections 5c, 5d, 5e and 5f.	At the end of welds where weld tabs have been removed, magnetic particle testing shall be performed on the same beam-to-column joints receiving UT. Rate of UT should be in accordance with AISC 360, Chapter N, sections 5e and 5f. The increase or reduction of UT should be according to sections 5e and 5f.

END SECTION

¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.

OBSERVE: Observe the items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



D. Structural Steel - AISC 341 Requirements (Seismic Provisions)

Section THIS SECTION APPLICABLE IF BOX IS CHECKED:

NONDESTRUCTIVE TESTING OF WELDED JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 341-10: Section J6.2		
TASK	INSPECTION TYPE ¹	DESCRIPTION
[NOTE: RDP may uncheck this section for projects NOT designed in accordance with AISC 341 (SEISMIC PROVISIONS) or for projects designed according to AISC 341, but using an R value equal to 3]		
5 CJP groove welds	OBSERVE AISC 341, Section J6.2b	UT is used to detect serious flaws in groove welds, but is not suitable for the detection of surface or near- surface flaws. MT is used to detect serious flaws on or near the surface of welds. Because visual inspection is also done for all CJP groove welds, detecting the most serious surface defects invokes MT at a rate of 25%
6. Beam cope and access hole	OBSERVE AISC 341, Section J6.2d	At welded splices and connections, thermally cut surfaces of beam copes and access holes shall be tested using magnetic particle testing (MT) or dye penetrant testing (PT), when the flange thickness exceeds 1 ½ in. for rolled shapes, or when the web thickness exceeds 1 ½ in. for built-up shapes.
7. K-area NDT (AISC 341)	PERFORM AISC 341, Section J6.2a	Where welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, the web shall be tested for cracks using magnetic particle testing (MT). The MT inspection area shall include the k-area base metal within 3-inches of the weld. The MT shall be performed no sooner than 48 hours following completion of the welding.

END SECTION

- ¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe the items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



E. Structural Steel - Composite Construction¹

THIS SECTION APPLICABLE IF BOX IS CHECKED:

COMPOSITE CONSTRUCTION PRIOR TO PLACING CONCRETE – VERIFY THE FOLLOWING ARE IN COMPLIANCE
IBC 1705.2.1, AISC 360-10: Table N6.1, AISC 341-10: Table J9-1

TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Placement and installation of steel headed stud anchors	PERFORM	
2. Material identification of reinforcing steel (Type/Grade)	OBSERVE	
3. Determination of carbon equivalent for reinforcing steel other than ASTM A706	OBSERVE	
4. Proper reinforcing steel size, spacing, clearances, support, and orientation	OBSERVE	
5. Reinforcing steel has been tied and supported as required	OBSERVE	

END SECTION

F. Structural Steel - Other Inspections

THIS SECTION APPLICABLE IF BOX IS CHECKED:

OTHER STEEL INSPECTIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE
IBC 1705.2.1, AISC 341-10: Tables J8-1 & J10-1

TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Anchor rods and other embedments supporting structural steel	PERFORM	Verify the diameter, grade, type, and length of the anchor rod or embedded item, and the extent or depth of embedment prior to placement of concrete.
2. Fabricated steel or erected steel frame	OBSERVE	Verify compliance with the details shown on the construction documents, such as braces, stiffeners, member locations and proper application of joint details at each connection.
3. Reduced beam sections (RBS) where/if occurs		<ul style="list-style-type: none"> ✓ Contour and finish ✓ Dimensional tolerances
4. Protected zones		No holes or unapproved attachments made by fabricator or erector
5. H-piles where/if occurs		No holes or unapproved attachments made by the responsible fabricator

END SECTION

¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification

OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



G. Structural Metal Deck - Placement Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

METAL DECK INSPECTION <u>PRIOR TO</u> DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.1 - AWS D1.3		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Verify compliance of materials (deck and all deck accessories) with construction documents, including profiles, material properties, and base metal thickness	PERFORM	
2. Documents acceptance or rejection of deck and deck accessories		
METAL DECK INSPECTIONS <u>DURING</u> DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.2		
TASK	INSPECTION TYPE ¹	DESCRIPTION
3. Verify compliance of deck and all deck accessories installation with construction documents	PERFORM	
4. Verify deck materials are represented by the mill certifications that comply with the construction documents	PERFORM	
5. Document acceptance or rejection of installation of deck and deck accessories		
METAL DECK INSPECTION <u>AFTER</u> DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.3		
TASK	INSPECTION TYPE ¹	DESCRIPTION
6. Welding procedure specification (WPS) available	PERFORM	
7. Manufacturers certifications for welding consumables available	OBSERVE	
8. Material identification (type/grade)	OBSERVE	
9. Check welding equipment	OBSERVE	

END SECTION

- ¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe the items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



H. Structural Metal Deck - Welding Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

METAL DECK INSPECTION DURING WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.4 - AWS D1.3		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Use of qualified welders	OBSERVE	
2. Control and handling of welding consumables	OBSERVE	
3. Environmental conditions (wind speed, moisture, temperature)	OBSERVE	
4. WPS followed	OBSERVE	
METAL DECK INSPECTION AFTER WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.5		
TASK	INSPECTION TYPE ¹	DESCRIPTION
5. Verify size and location of welds, including support, side lap, and perimeter welds	PERFORM	
6. Welds meet visual acceptance criteria	PERFORM	
7. Verify repair activities	PERFORM	
8. Document acceptance or rejection of welds		

END SECTION

- ¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe the items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.



I. Structural Metal Deck - Fastening Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

METAL DECK INSPECTION <u>BEFORE</u> MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.6		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Manufacturer installation instructions available for mechanical fasteners	OBSERVE	
2. Proper tools available for fastener installation	OBSERVE	
METAL DECK INSPECTION <u>DURING</u> MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/WC-2011, Appendix 1, Table 1.7		
TASK	INSPECTION TYPE ¹	DESCRIPTION
3. Fasteners are positioned as required	OBSERVE	
4. Fasteners are installed in accordance with manufacturer’s instructions	OBSERVE	
METAL DECK INSPECTION <u>AFTER</u> MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.8		
TASK	INSPECTION TYPE ¹	DESCRIPTION
5. Check spacing, type, and installation of support fasteners	PERFORM	
6. Check spacing, type, and installation of side lap fasteners	PERFORM	
7. Check spacing, type, and installation of perimeter fasteners	PERFORM	
8. Verify repair activities	PERFORM	
9. Document acceptance or rejection of mechanical fasteners		

END SECTION

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OBSERVE: Observe these items on a random basis. Operations need not be delayed pending these inspections.

PERFORM: Perform these tasks for each weld, fastener or bolted connection and required verification.



J. Structural Cold-Formed Steel Light Frame Construction and Cold Steel Formed Trusses

THIS SECTION APPLICABLE IF BOX IS CHECKED:

COLD-FORMED METAL FRAMING CONSTRUCTION AND CONNECTIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.2, 1705.2.4, 1705.11.2, 1705.11.3		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Trusses spanning 60-feet or greater where/if applies	PERFORM	Verify that temporary and permanent truss restraint/bracing is installed in accordance with approved truss submittal package
2. Welded connections (seismic and/or wind resisting system)	OBSERVE	Visually inspect all welds composing part of the main wind or seismic force resisting system, including shearwalls, braces, collectors (drag struts), and hold-downs. [NOTE: RDP must identify critical wind and/or seismic force resisting welds in the contract drawings so that the special inspector can confirm compliance]
3. Connections (seismic and/or wind resisting system)	OBSERVE	Visually inspect all screw attachment, bolting, anchoring and other fastening of components within the main wind or seismic force resisting system, including roof deck, roof framing, exterior wall covering, wall to roof/floor connections, braces, collectors (drag struts) and hold-downs. [NOTE: RDP must identify critical wind and/or seismic force resisting connection/fastener components in the contract drawings so that the special inspector can confirm compliance]
4. Cold-formed steel (progressive collapse resisting system where/if applies)	OBSERVE	Verify proper welding operations, screw attachment, bolting, anchoring, and other fastening of components within the progressive collapse resisting system, including horizontal tie force elements, vertical tie force elements and bridging elements. [NOTE: RDP should identify critical progressive collapse resisting connection/fastener components in the contract drawings so that the special inspector can confirm compliance]

K. Structural Open-Web Steel Joist Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

OPEN-WEB STEEL JOISTS AND JOIST GIRDERS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC Table 1705.2.3		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Installation of open-web steel joists and joist girders	PERFORM Periodic	<ul style="list-style-type: none"> ✓ End connections – welded or bolted ✓ Bridging – horizontal and diagonal ✓ SJI specifications and sections 2207.1 of IBC Chap 22

END SECTION

- ¹ **PERFORM:** Perform these tasks for each weld, fastener or bolted connection, and required verification
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met.
PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.



L. Structural Concrete Construction Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

CONCRETE CONSTRUCTION, INCLUDING COMPOSITE DECK – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.3 (ACI 318 REFERENCES NOTED IN IBC TABLE)		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Inspect reinforcement, including prestressing tendons, and verify placement.	PERIODIC ACI 318, Chapter 20 25.2, 25.3 26.6.1 - 26.6.3	Verify prior to placing concrete that reinforcing is of specified type, grade and size; that is free of oil, dirt and unacceptable rust; that is located and spaced properly; that hooks, bends, ties, stirrups and supplemental reinforcement are placed correctly; that lap splices are in compliance; and that all mechanical connections are installed per the manufacturer's instructions and/or evaluation report. Concrete cover should comply with Chapter 20 requirements.
2. Reinforcing bar welding	PERIODIC AWS D1.4 ACI 318, 26.6.4	<ul style="list-style-type: none"> ✓ Verify weldability of reinforcing bars other than ASTM A 706 ✓ Inspect single-pass fillet welds, maximum 5/16" in accordance with AWS D1.4; Welders should be certified in accordance with AWS D1.4.
3. Inspect Anchor Rods (cast in concrete)	PERIODIC AISC 360, Chap N, Section N5(7)	<ul style="list-style-type: none"> ✓ Diameter, grade, type, length of rod and extent or depth of embedment verified prior to placement of concrete
4. Post-installed anchors in hard concrete <ul style="list-style-type: none"> a. Adhesive anchors installed horizontally or upward b. Mechanical anchors and adhesive anchors not defined in 4a. 	CONTINUOUS ACI 318, 17.8.2.4 PERIODIC ACI 318, 17.8.2	<ul style="list-style-type: none"> ✓ Inspect as required by ACI 318 and ACI 355.4 ✓ Verify that installer is certified for installation of horizontal & overhead applications (ACI 318, 17.8.2.2) ✓ Inspect proof loading as required - contract documents
5. Verify use of required mix design	PERIODIC ACI 318, Chap 19, 26.4.3, 26.4.4	Verify that all mixes comply with the approved mix designs, ACI 318 Chapter 19 and construction documents. Observe compliance with assigned exposure class of concrete.
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete	CONTINUOUS ASTM C31 and C172 ACI 318, 26.4, 26.12 ACI 318 Sect 1908.9	Obtain QC sample of concrete and fabricate test specimens according to ASTM C 31 and ASTM C 172 and provide standard curing for specimens. Evaluate compliance of concrete with code requirements in 26.12 for acceptance.
7. Inspect concrete and/or shotcrete placement for proper application techniques	CONTINUOUS ACI 318, 26.5	Verify proper placement techniques are used during concrete conveyance and depositing to avoid segregation and contamination; Observe surface preparation including construction joints for compliance with code and contract documents.
8. Verify maintenance of specified curing temperature and technique	PERIODIC ACI 318, 26.5.3 – 26.5.5	Inspect curing, cold weather protection, and hot weather protection procedures.
9. Pre-stressed Concrete	CONTINUOUS ACI 318, 26.10	Verify application of prestressing forces and grouting of bonded prestressing tendons.

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PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.

CONTINUOUS: Special inspector is present when and where the work to be inspected is being performed or installed.



L. Structural Concrete Construction Section (continued)

THIS SECTION APPLICABLE IF BOX IS CHECKED:

CONCRETE CONSTRUCTION, INCLUDING COMPOSITE DECK – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.3 (ACI 318 REFERENCES NOTED IN IBC TABLE)		
TASK	INSPECTION TYPE ¹	DESCRIPTION
10. Inspect erection of precast concrete members	PERIODIC ACI 318, 26.9	Tolerances and concrete cover; Type, size and location of embedments. Visual welding inspection of welded embedments according AWS D1.1
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	PERIODIC ACI 318, 26.11.2	Method of concrete placement, rate of concrete placement; avoidance of damage to previously constructed members.
12. Inspect formwork for shape, location and dimensions of the concrete member being formed	PERIODIC ACI 318, 26.11.1.2(b)	Formwork fabrication and installation shall result in a final member that complies with construction documents.

END SECTION

PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.

CONTINUOUS: Special inspector is present when and where the work to be inspected is being performed or installed.

Periodic and Continuous special inspections are defined in Chapter 2 of the IBC code.



M. Structural Masonry Construction Section (All Risk Categories)

THIS SECTION APPLICABLE IF BOX IS CHECKED:

MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE <u>AT START OF CONSTRUCTION</u> (Verify f'm in accordance with Article 1.4B prior to construction for Level B and Level C quality assurance projects) IBC 1705.4 (TMS 602-13/ACI 530.1-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Compliance with approved submittals prior to start	PERIODIC	
2. Proportions of site-mixed mortar.	PERIODIC	
3. Grade and type of reinforcement, anchor bolts, and prestressing tendons and anchorages	PERIODIC	
4. Prestressing technique	PERIODIC	
5. Properties of thin bed mortar for AAC masonry	PERIODIC	
MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE <u>PRIOR TO</u> GROUTING IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE ¹	DESCRIPTION
6. Grout space	Periodic CONTINUOUS	Periodic inspection for Risk Categories II and III and continuous inspections for Risk Category IV
7. Proportions of site-prepared grout and prestressing grout for bonded tendons	PERIODIC	
8. Proportions of site-mixed grout and prestressing grout for bonded tendons	PERIODIC	
9. Placement of masonry units and mortar joints	PERIODIC	
10. Welding of reinforcement	CONTINUOUS	
MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE <u>DURING</u> CONSTRUCTION IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE ¹	DESCRIPTION
11. Size and location of structural elements is in compliance	PERIODIC	
12. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°C) or hot weather (temp above 90°F (32.2°C))	PERIODIC	
13. Application and measurement of prestressing force	CONTINUOUS	
14. Placement of grout and prestressing grout for bonded tendons	CONTINUOUS	
15. Placement of AAC masonry units and construction of thin bed mortar joints	CONTINUOUS	Continuous for first 5000 square feet only (465 square meters)
16. Observe preparation of grout specimens, mortar specimens, and/or prisms	PERIODIC	ASTM C 780 tests and mock-up panels required by most masonry specs and especially when masonry sand does not comply with ASTM C 144
17. Type, size and placement of reinforcement, connectors, anchor bolts and prestressing tendons and anchorages, including details of anchorage of masonry to structural members, frames, or other construction	PERIODIC CONTINUOUS	Periodic inspection for Risk Categories II and III and continuous special inspections for Risk Category IV

END SECTION

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PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.

CONTINUOUS: Special inspector is present when and where the work to be inspected.

Periodic and Continuous special inspections are defined in Chapter 2 of the IBC code.



N. Structural Wood Construction - Specialty Items Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

WOOD CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.5		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. High-load diaphragms where applicable	PERIODIC IBC 1705.5.1	Verify thickness and grade of sheathing, size of framing members at panel edges, nail diameters and length, and the number of fastener lines and that fastener spacing is per approved contract documents
2. Metal-plate connected wood trusses spanning 60 feet or greater	PERIODIC IBC 1705.5.2	Verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal

END SECTION

O. Structural Wood Construction - Seismic and Wind Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

WOOD CONSTRUCTION SEISMIC AND WIND – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.5		
TASK	INSPECTION TYPE ¹	DESCRIPTION
[NOTE: RDP may uncheck this section where sheathing nailing/fasteners (both shear wall and roof) are consistently greater than 4" on center, or if the design wind speed is less than 110 mph (49 meters/sec) AND the seismic design category is A or B]		
1. Nailing, bolting, anchoring and other fastening of elements of the main wind/seismic force-resisting system	PERIODIC IBC 1704.2.5	Includes connectors for: shearwall sheathing, roof/floor sheathing, grade, struts/collectors, braces, hold downs, roof and floor framing connections to exterior walls

END SECTION

P. Structural Isolation and Energy Dissipation Systems Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

ISOLATION AND ENERGY DISSIPATION SYSTEMS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.5		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Fabrication and installation	OBSERVE	Verify that fabrication and installation of isolator units and energy dissipation devices conform to manufacturer's recommendations and approve construction documents.

END SECTION

¹ **OBSERVE:** Observe these items on a random sampling basis daily to ensure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.

CONTINUOUS: Special inspector is present when and where the work to be inspected is being performed or installed.



Q. Geotechnical - Soils Inspection Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SOILS SPECIAL INSPECTIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC Section 1705.6 and Table 1705.6		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Materials below shallow foundations are adequate to achieve the design bearing capacity	PERIODIC	
2. Excavations are extended to proper depth and have reached proper material	PERIODIC	
3. Perform classification and testing of compacted fill materials.	PERIODIC (ASTM D2487)	
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill	CONTINUOUS	
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly	PERIODIC	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

END SECTION

R. Geotechnical - Driven Deep Foundation Elements Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS - DEEP DRIVEN FOUNDATION CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.7		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Verify element materials, sizes and lengths comply with requirements	CONTINUOUS	
2. Inspect driving operations and maintain complete and accurate records for each element	CONTINUOUS	
3. 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	CONTINUOUS	Monitor compliance of steel elements in accordance with IBC section 1705.2 and concrete elements in accordance with IBC section 1705.3.

END SECTION

The approved geotechnical report required by IBC, Chapter 18, section 1803.1 should be used by the special inspector to perform the soils special inspections and testing tasks required by IBC, Chapter 17, sections 1705.6, 1705.7 and 1705.8.

¹ **PERIODIC:** Special inspector is intermittently present while the work to be inspected has been or is being performed.

CONTINUOUS: Special inspector is present when and where the work to be inspected is being performed or installed.



S. Geotechnical Helical Pile Foundations Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS ON HELICAL PILE FOUNDATIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE

IBC 1705.9

TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Continuous special inspections shall be performed during installation of helical pile foundations. Record installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by IBC section 1705.9. The approved geotechnical report and the contract documents shall be used to determine compliance	CONTINUOUS IBC section 1705.9	

END SECTION

PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.

CONTINUOUS: Special inspector is present when and where the work to be inspected is being performed or installed.



T. Geotechnical - Cast-in-Place Deep Foundation Elements Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS ON CAST IN PLACE DEEP FOUNDATION ELEMENTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.8		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Inspect drilling operations and maintain complete and accurate records for each element	CONTINUOUS	
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	CONTINUOUS	
3. 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	CONTINUOUS	

END SECTION

¹ **CONTINUOUS:** Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.



U. Fire Protection - Sprayed Fire-Resistant Materials Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS ON SPRAYED FIRE RESISTANT MATERIALS (SFRM) – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.14		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Surface condition	PERIODIC	Prior to application confirm that surface has been prepared per the approved fire-resistance design and manufacturer's instructions.
2. Application	PERIODIC	Prior to application confirm that the substrate meets the minimum ambient temperature per the approved fire-resistance design and manufacturer's instructions according to IBC section 1705.14.3.
3. Material thickness	PERIODIC ASTM E 605	Verify that the thickness of the SFRM to structural elements is not less than the thickness required by the fire-resistant design in more than 10% of the measurement, but in no case less than minimum allowable thickness required by IBC section 1705.14. Frequency of thickness tests performed according to IBC section 1705.14.4 through 1705.14.4.9.
4. Material density	PERIODIC ASTM E 605	The density of the SFRM shall not be less than the density specified in the approved fire-resistance design. Density shall be determined in accordance with ASTM E 605. The frequency of density tests shall be according to IBC section 1705.14.5(1) through 1705.14.5(2).
5. Bond strength	PERIODIC ASTM E 736	Verify cohesive/adhesive bond strength of the cured SFRM applied to structural element is not less than 150psf and according to IBC 1705.14.6. For high-rise buildings , minimum bond strength must comply with Chapter 4, Table 403.2.4. Frequency of bond strength tests must be in accordance with IBC section 1705.14.6.1 and 1705.14.6.2.

END SECTION

V. Fire Protection - Mastic and Intumescent Coatings Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS ON MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.15		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Surface preparation	PERIODIC	Inspections shall be performed in accordance with AWCI 12-B and the contract documents according to IBC section 1705.15.

END SECTION

1

PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.

CONTINUOUS: Special inspector is present when and where the work to be inspected is being performed or installed.

OBSERVE: Observe these items on a random basis. Operations need not be delayed pending these inspections.



W. Fire Protection - Fire Resistant Penetrations and Joints Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS - FIRE RESISTANT PENETRATIONS AND JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.17		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Inspections of penetration firestop systems conducted in accordance with ASTM E 2174	PERIODIC	[NOTE: This section applies to Risk Category III and IV only. RDP may choose to uncheck this section where project is assigned to Risk Category I or II. Confirm Risk Category with Structural Engineer]
2. Inspections of fire-resistant joint systems conducted in accordance with ASTM E 2393	PERIODIC	

END SECTION

X. Fire Protection - Smoke Control Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS - SMOKE CONTROL – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.17 and 1705.18		
TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Verify device locations and perform leakage testing	PERIODIC	Perform during erection of ductwork and prior to concealment
2. Pressure difference testing, flow measurements and detection and control verification	PERIODIC	Perform prior to occupancy and after sufficient completion

END SECTION

- ¹ **PERIODIC:** Special inspector is intermittently present while the work to be inspected has been or is being performed.
CONTINUOUS: Special inspector is present when and where the work to be inspected is being performed or installed.



Y. Architectural - Exterior Insulation and Finish Systems Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS - EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.16

TASK	INSPECTION TYPE ¹	DESCRIPTION
1. Water resistive barrier coating applied over a sheathing substrate	PERIODIC	Verify that water resistive barrier coating complies with ASTM E 2570 [NOTE: not applicable to masonry or concrete wall applications. Uncheck this sections in those cases]

END SECTION

Z. Architectural - Architectural Components

THIS SECTION APPLICABLE IF BOX IS CHECKED:

SPECIAL INSPECTIONS FOR ARCHITECTURAL COMPONENTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC Section 1705.12.5 and 1705.12.7

TASK	INSPECTION TYPE ¹	DESCRIPTION
[NOTE: This section is not applicable to Seismic Design Categories A, B, & C. Uncheck this section if one of those categories applies. Confirm Seismic Design Category with the structural engineer]		
1. Erection and fastening of exterior cladding and interior and exterior veneer.	PERIODIC	Verify appropriate materials, fasteners, and attachment at commencement of work and at completion. Inspector Note: Inspection not required if height is less than 30 feet or weight is less than 5psf.
2. Interior and exterior non-load bearing walls	PERIODIC	Verify appropriate materials, fasteners, and attachment at commencement of work and at completion. Inspector Note: Inspection not required if height is less than 30 feet. Also, Interior non-load bearing walls need not be inspected if weighing less than 15psf.
3. Access floors	PERIODIC	Verify that anchorage complies with approved construction documents. Inspection of post-installed anchors shall comply with ACI 318-14, Chapter 17, and section 17.8.
4. Storage racks	PERIODIC	Verify that anchorage complies with approved construction documents. Inspection of post-installed anchors shall comply with ACI 318-14, Chapter 17, and section 18.8. Inspector Note: Not required for racks less than 8 feet in height.

END SECTION

1

PERIODIC: Special inspector is intermittently present while the work to be inspected has been or is being performed.



AA. Plumbing/Mechanical/Electrical Designated Seismic Systems Section

THIS SECTION APPLICABLE IF BOX IS CHECKED:

PLUMBING, MECHANICAL AND ELECTRICAL – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.12.4		
TASK	INSPECTION TYPE ¹	DESCRIPTION
[NOTE: This section is not applicable to Seismic Design Categories A or B. Uncheck this section if one of those categories applies. Confirm Seismic Design Category with the structural engineer]		
1. Designated Seismic Systems equipment verification	OBSERVE ASCE 7, section 13.2.2	<ul style="list-style-type: none"> ✓ Verify model number and serial number are in conformance with project specific seismic qualification (PSSQ) ✓ Verify Tag ID is correct and installed per specifications
2. Designated Seismic Systems equipment Mounting	OBSERVE ASCE 7, section 13.2.2	<ul style="list-style-type: none"> ✓ Verify that Anchor Base Bolting is Installed per PSSQ ✓ Verify that Equipment Bracing is installed per PSSQ ✓ Verify that Bracing Attachments are installed per PSSQ
3. Designated Seismic Systems utility Conduit/Piping	OBSERVE ASCE 7, section 13.2.2	<ul style="list-style-type: none"> ✓ Verify Conduit/Piping is connection to the equipment per PSSQ (flex or rigid) ✓ Verify that Conduit/Piping is seismically supported independently of equipment and in accordance with PSSQ support requirements
4. Designated Seismic Systems clearance	OBSERVE	<ul style="list-style-type: none"> ✓ Adjacent Equipment – Verify that there is adequate gap to eliminate possibility of pounding ✓ Conduit/Piping – Verify that there is adequate gap to eliminate possibility of pounding

END SECTION

¹ **OBSERVE:** Observe these items on a random sampling basis to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor’s risk.



About *the* Author...Alan S. Tuck

Alan is THE foremost thought leader on IBC as it relates to Special Inspections in the mid-Atlantic. This may seem a provocative statement, but only if you have not attended one of his presentations and benefitted from Alan's enthusiastic discourse on topics of code. Heck, Alan practically WROTE the code. His research, experience and subsequent work became the foundation of code special inspection programs developed by counties across the Commonwealth. Not only that, Alan has walked the talk. He is knowledgeable because he has the hands-on work experience to make it so. Over FIVE decades of it. Known all over Virginia and beyond and awarded and honored time and time again by more trade associations than we can name here, Alan Tuck has assisted A/E professionals of all ages and stripes with better understanding how the code relates to what they do every day. How thoroughly in-the-know is Alan when it comes to the CODE? Just ask our competition - they regularly attend his workshops and learning events to keep up to speed.

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