Attachment B
Statement of Special Inspections (SSI)*

[* As an alternative to the Word tables, a spreadsheet is acceptable.]

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Other than the editing referred to immediately below, this template can be used as-is for ML-3 and ML-4 projects. Prior to using the template for ML-1 and ML-2 projects, significant revision(s) will be necessary (e.g., replacing references to ACI 318 with references to ACI 349, etc.). For more detail on this, refer to author note at the outset of the applicable material specification section template (e.g., 03 3001 for reinforced concrete, 05 1000 for structural steel, etc.).

This template **must** be edited for each project. What follows are examples of the editing typically required:

- *Italicized* text = place-holders that shall be made project-specific;
- *C*heck boxes (i.e., ☒) shall be checked /unchecked as appropriate;
- Bracketed text (i.e., [ ]) shall be: a) deleted if not applicable, b) have brackets removed if applicable, or c) revised (to make it applicable) and have brackets removed;
- Text enclosed by stars (e.g., ****) shall be deleted.

****

Project: *Construct/Alter/Retrofit XYZ Structure, System, Component*

Location: *TA-XX, Bldg XXXX*

IBC Code Year: *2015*[1]

Primary Design Professionals:
Name, Firm, Structural
Name, Firm, Architectural
Name, Firm, Electrical
Name, Firm, Mechanical
Name, Firm, Fire

This SSI is a requirement of International Building Code (IBC) Chapter 17. Unless noted otherwise, the special inspections listed herein are hold/witness points in that, as it sees fit, LANL will observe/conduct them. If special tests are required, the performance of them is always the responsibility of the Subcontractor (i.e., 'constructor') unless noted otherwise. Finally, if reports and certificates are required, the submission of them is always the responsibility of the constructor

This SSI encompasses the following disciplines:

☒ Structural ☒ Mechanical/Electrical/Plumbing
☒ Architectural ☒ Other: *[Geotechnical][, ____]*
☒ Fire

[1] See Chapter 35 therein for the versions of the standards that are applicable herein.

The LANL Special Inspectors on the project shall keep records of all inspections and shall furnish interim inspection reports to the LANL Chief Inspector (LCI) and the LANL Project Manager. LANL ESM Chapter 16, Section IBC-IP Attachment D – IBC Inspection Daily Report shall be used as the basis for the report. Discovered discrepancies shall be brought to the immediate attention of the constructor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the LCI and DPIRC[2]. The LANL inspection program does not relieve the constructor of their responsibilities.

Interim Report Frequency: *[Daily as inspections are performed]*

A Final Report documenting completion of all required inspections, testing and correction of any discrepancies noted in the inspection reports shall be submitted to the LCI prior to issuance of Official Acceptance of Construction. LANL ESM Chapter 16, Section IBC-IP Attachment E – IBC Inspection Final Report shall be used as the basis for the report.

In addition to the submittal of reports on inspections and tests, the reports and certificates in Table 1704.5 shall be submitted to the LCI and DPIRC:

Job-site safety, and means and methods of construction, are solely the responsibility of the constructor.

In the event of a true conflict between this SSI and the Project Specification, the more stringent requirement applies.

****

If Structural Observation (SO) for seismic resistance[3] applies to the Project, the DPIRC is responsible for (informally) appending the SO form to the SSI. The template of the form is ESM Ch. 16, Sect. IBC-IP, Attachment G.

Make template project-specific by filling in Project title/name, and description/listing of seismic force resisting system(s) and/or designated seismic systems. Commit to the number of visits and extent of observation planned. Do not delete the Notes to Observer at the start of the form.

Delete the following statement in square brackets if SO doesn't apply to project.

****

[Structural Observations: Shall be provided per the provisions of IBC paragraph 1704.6 and shall consist of visual observations of the structural systems by a registered design professional (i.e., DPIRC unless LANL has approved some alternative) for conformance to the approved construction documents at significant construction stages and at completion of the structural system.]

[2] 1704.2.4. Goal is to not have any open discrepancies that are turned over to the facility unless it can be shown that the LCI and the DPIRC are aware of them and will accept them.
[3] LANL is not subject to the IBC requirement for SO for wind resistance since V_{asd} = 93 mph < 110 mph for RC III and IV buildings and structures. Refer to IBC 1704.6.2, and ESM Ch. 5, Sect. II for more detail.

Signature Page

Statement of Special Inspections Prepared By:

(type or print name)

Signature Date

Statement of Special Inspections Submitted By:

(type or print name)

Signature Date

Design Professional Seal Structural	*Design Professional Seal Architectural*
Design Professional Seal Mechanical	*Design Professional Seal Electrical*

LANL Inspection Group (CM-CE) Acceptance

LBO stamp applied by LANL Eng Project Delivery Group (ref. IBC-GEN)

Signature Date

Schedule of Inspection and Testing Agencies

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IBC Ch. 17 includes special inspections for wood construction and/or structures; however, other than the Wood checkbox below, these inspections are not included herein because wood construction/structures at LANL are rare. In the event that a project includes wood construction/structures then this template must be edited in accordance with the wood requirements in IBC Ch. 17.

The same applies to driven deep foundations, cast-in-place deep foundations, and helical pile foundations.

Finally, related to deep foundations, IBC 1705.12.1.2 and 1705.13.1.2 requires inspection and testing, respectively, for seismic resistance of structural steel foundation elements in accordance with the quality assurance provisions of AISC 341 Ch. J. Since the only mention in '341' Ch. J of anything that could be construed as foundation elements pertains to H-piles, Tables 1705.12 and 1705.13 herein do not include foundation elements.

****

This SSI includes inspections, tests, and submittals pertaining to the following:

- ☐ Reports and Certificates
- ☐ Special Cases
- ☐ Structural Steel
- ☐ Cold-Formed Steel (CFS) Deck
- ☐ Open-web Steel Joists and Joist Girders
- ☐ Cold-Formed Steel (CFS) Trusses Spanning ≥ 60 Feet
- ☐ Concrete Construction
- ☐ Masonry Construction Level B
- ☐ Masonry Construction Level C
- ☐ Wood Construction
- ☐ Soils
- ☐ Driven Deep Foundations
- ☐ Cast-in-Place Deep Foundations
- ☐ Helical Pile Foundations
- ☐ Fabricated Items
- ☐ Special Inspections for Seismic Resistance
- ☐ Testing for Seismic Resistance
- ☐ Sprayed Fire-Resistant Materials
- ☐ Mastic and Intumescent Fire-Resistant Coatings
- ☐ Exterior Insulation and Finish Systems (EIFS)
- ☐ Fire-Resistant Penetrations and Joints
- ☐ Testing for Smoke Control

Special Inspection Agencies	Firm	Address, Telephone, e-mail
1. IBC Special Inspections unless otherwise noted	*LANL*	*LANL*
2. Soils Testing Agency	*TBD*	*TBD*

3. Concrete Testing Agency	*TBD*	*TBD*
4. Masonry Testing Agency	*TBD*	*TBD*
5. Steel/Rebar Testing Agency	*TBD*	*TBD*
6. Other	*TBD*	*TBD*
7. DPIRC/Engineer of Record	*TBD*	*TBD*

TBD: To be determined

Note: The inspectors shall be engaged by the LANL or LANL's Agent except where SSI notes "Subcontractor Scope." In those cases, the testing agencies must be approved by the LBO before engaged by the Subcontractor. Any conflict of interest must be disclosed to the LCI prior to commencing work.

****

When project includes special inspections or tests for seismic resistance[4] (ref. Tables 1705.12 and 1705.13, respectively, herein), the seismic force-resisting system (SFRS), designated seismic system (DSS), and/or seismic force-resisting components, subject to the inspections or tests shall be identified using the following template.

In addition, the DPIRC is responsible for appending the Subcontractor's Statement of Responsibility form to the SSI. The form template is ESM Ch. 16, Sect. IBC-IP, Attachment H.
Make template project-specific by filling in Project title/name, and the information mentioned above.

If Tables 1705.12 and 1705.13 are not applicable to project then delete the "Identification of Items Subject to Special Inspections and Tests for Seismic Resistance" material that follows.
****

[4] LANL is not subject to the IBC requirement for special inspections for wind resistance since V_{asd} = 93 mph < 110 mph for RC III and IV buildings and structures. Refer to IBC 1705.11, and ESM Ch. 5, Sect. II for more detail.

Identification of Items Subject to Special Inspections and Tests for Seismic Resistance

Seismic Force-Resisting Systems *[Y/N]*

[Structural Steel
[Composite] [Eccentrically] [Special] [Ordinary] [Concentrically] [Buckling-Restrained] Braced Frames]

[Composite] [Special] Plate Shear Walls]

[Composite] [Special] [Intermediate] [Ordinary] [Truss] [Partially-Restrained] Moment Frames]

[Special Cantilever Column Systems]

[Cold-formed Steel]
[Light-Framed Construction] [Special Bolted Moment Frames]

Designated Seismic Systems *[Y/N]*

[Active mechanical equipment/components: _____, _____, _____]

[Active electrical equipment/components: _____, _____, _____]

[Components associated with hazardous materials: _____, _____, _____]

Seismic Force-Resisting Components *[Y/N]*

[Structural Steel
[struts] [, collectors] [, and] [chords]

[Architectural Components: [exterior cladding] [, interior] [and] [exterior] nonbearing walls] [, interior] [and] [exterior] veneer]

[Plumbing/Mechanical Components: [piping systems carrying hazardous materials] [and their associated mechanical units] [, and] [ductwork carrying hazardous materials]

[Electrical Components: [electrical equipment for emergency] [and] [standby] power systems]

[Storage Racks: _____, _____, _____]

Statement of Responsibility

Each Subcontractor and Subtier responsible for the construction or fabrication of a system or component listed above must submit a Statement of Responsibility (SoR).

The DPIRC is responsible for A) Attaching /appending the SoR to this SSI, and B) Completing the portions of the SoR that are within his/her purview. The Subcontractor/Subtier, in turn, is responsible for completing the SoR, signing it, and then submitting it to LANL.

SSI Tables

****

The minimum scope of the inspections, testing, and submittals required for the project must be determined by the DPIRC **but shall not be less than that required by IBC Chapter 17.** The LBO, through its reviewers, and/or the DPIRC can require more than IBC requirements.

With this in mind, the following tables must be edited in accordance with the Author Note on pp. 1, and the following:

- **If any table does not apply then the entire table shall be deleted.**
- **If only a line item(s) within a table does not apply then, rather than deleting the line item(s), an "N" shall be used in the 1st column of the line item(s).**

****

LEGEND (applicable to the terms, symbols and acronyms used in the following tables)

Y (Yes) or X = required

N (No) or N/A (Not Applicable) = not required

CoC = certificate of compliance

IAW = in accordance with

Rebar = reinforcing bars/steel in concrete or masonry

CFS = cold-formed steel

TMS 402 = TMS 402/ACI 530/ASCE 5

TMS 602 = TMS 602/ACI 530.1/ASCE 6

SFRS = seismic force-resisting system

DSS = designated seismic system

NDT = nondestructive testing

17_ _ . _ = IBC Ch. 17 section/paragraph that is the source of the requirement, or where details on the requirement are located.

Special Inspection Frequency

- Continuous = Present when and where work to be inspected is being performed.
- Periodic = Informed of when and where work to be inspected is occurring but may be intermittently present.

Referenced Standard = Source of the requirement, or where details on the requirement are found (outside of/ in addition to IBC)

IBC Reference = IBC section/paragraph outside of Ch. 17 that is the source of the requirement, or where details on the requirement are found, which further inform the inspection

DEFINITIONS

Construction Documents = Construction drawings, specifications, shop drawings and erection drawings, etc.

Nonstructural Concrete = Any element made of plain or reinforced concrete that is not part of a structural system required to transfer either gravity or lateral loads to the ground. [2015 IBC]

Structural System = Interconnected structural framing (e.g., diaphragms, beams, girders, columns, walls, etc.) and foundation elements (e.g., footings, piles, etc.) designed to resist gravity and/or lateral loads. Some examples of the vertical portion of structural framing are moment frames, braced frames, a combination of moment frames and shear walls, etc. Some examples of the horizontal portion of structural framing are reinforced-concrete roofs/floors, structural steel roof/floor framing, composite steel roof/floor decking, trusses, etc. In ASCE 7, the structural system doesn't include the foundation, while in ACI 318 it does. Structural systems occur in building and nonbuilding structures. They also occur with elevators and hoistways, which are nonstructural components (ref. ASCE 7 Chapter 13).

STEEL REPORTS and CERTIFICATES -- Submittals (1704.5)

Required? Y/N	Submittal Item
[Y]	1. CoCs for the fabrication of structural, load bearing or lateral load-resisting members or assemblies on the premises of a registered and approved fabricator IAW 1704.2.5.1.
[Y]	2. Available Documents for Structural Steel Construction indicated in Table 1704.5a herein [5]
[Y]	3. Available Documents for CFS (Floor and Roof) Deck indicated in 1704.5b herein[6]
[Y]	4. CoCs for the seismic qualification of nonstructural components, supports and attachments IAW 1705.13.2.
[Y]	5. CoCs for designated seismic systems IAW 1705.13.3.
[Y]	6. Reports of preconstruction tests for shotcrete IAW IBC Section 1908.5.
[Y]	7. CoCs for open-web steel joists and joist girders IAW IBC Section 2207.5.
[Y]	8. Reports of material properties verifying compliance with the requirements of AWS D1.4 for weldability as specified in ACI 318 Section 26.6.4 for rebar complying with a standard other than ASTM A 706 that are to be welded.
[Y]	9. Reports of mill tests IAW ACI 318 Section 20.2.2.5 for rebar 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.

AVAILABLE DOCUMENTS for STRUCTURAL STEEL CONSTRUCTION -- 1704.5a

Required? Y/N	Document
	The following documents shall be made available in electronic or printed form for review by the LCI and/or DPIRC prior to fabrication or erection, as applicable, unless otherwise required in the contract documents to be submitted:
[Y]	1. For main structural steel elements, copies of material test reports in accordance with AISC 360 Chapter A, Section A3.1.
[Y]	2. For steel castings and forgings, copies of material test reports in accordance with AISC 360 Chapter A, Section A3.2.
[Y]	3. For fasteners, copies of manufacturer's certifications in accordance with AISC 360 Chapter A, Section A3.3.
[Y]	4. For deck fasteners, copies of manufacturer's product data sheets or catalog data. The data sheets shall describe the product, limitations of use, and recommended or typical installation instructions.
[Y]	5. For anchor rods and threaded rods, copies of material test reports in accordance with AISC 360 Chapter A, Section A3.4.
[Y]	6. For welding consumables, copies of manufacturer's certifications in accordance with AISC 360 Chapter A, Section A3.5.
[Y]	7. For headed stud anchors, copies of manufacturer's certifications in accordance with AISC 360 Chapter A, Section A3.6.
[Y]	8. Manufacturer's product data sheets or catalog data for welding *filler metals* and fluxes to be

[5] Although this is required by IBC, it is not stipulated in 1704.5. IBC 1705.2.1 requires these submittals by way of reference to the AISC 360 quality assurance (QA) inspection requirements (i.e., AISC 360 Ch. N, in which QA is defined as being "…those tasks designated special inspection by the [IBC]."). ASIC 360 Section N5.2 requires the special inspector to "…review the [thirteen (13) documents] as listed in N3.2 [Available Documents for Steel Construction] for compliance with the construction documents."

[6] Similar to footnote above; IBC 1705.2.2 requires compliance with SDI QA/QC, etc. SDI QA/QC Section 2.2 lists nine (9) documents.

	used. The data sheets shall describe the product, limitations of use, recommended or typical welding parameters, and storage and exposure requirements, including baking, if applicable.
[Y]	9. Welding procedure specifications (WPSs).
[Y]	10. Procedure qualification records (PQRs) for WPSs that are not prequalified in accordance with AWS D1.1 or AWS D1.3, as applicable.
[Y]	11. Welding personnel performance qualification records (WPQR) and continuity records.
Y	12. Fabricator's or erector's, as applicable, written quality control manual that shall include, as a minimum: a. Material control procedures b. Inspection procedures c. Nonconformance procedures
Y	13. Fabricator's or erector's, as applicable, QC inspector qualifications.

AVAILABLE DOCUMENTS for CFS DECK -- 1704.5b

Required? Y/N	Document
	The following documents shall be made available in electronic or printed form for review by the LCI and/or DPIRC prior to installation of the steel deck, unless otherwise required in the contract documents to be submitted:
[Y]	1. Manufacturer's installation instructions and product data sheets, catalogue data, or independent evaluation reports for mechanical fasteners.
[Y]	2. Manufacturer's product data for welding consumables.
[Y]	3. Manufacturer's product data sheets or catalog data for welding filler metals and fluxes to be used. The data sheets shall describe the product, limitations of use, recommended or typical welding parameters, and storage and exposure requirements, including baking, if applicable.
Y	4. Mill certification of sheet steel used for deck.
[Y]	5. Welding procedure specifications (WPS).
[Y]	6. Procedure qualification records (PQR) for WPS that are not prequalified in accordance with AWS D1.1 or D1.3, as applicable.
[Y]	7. Welding personnel performance qualification records (WPQR).
[Y]	8. Installer's written quality control program (QCP).
[Y]	9. Installer's QC Inspector qualifications.

SPECIAL CASES -- Special Inspection and Tests (1705.1.1)

**********If this table is applicable, it shall be edited to include 'project-specifics' in the 2nd column (in lieu of the examples there now), whether the Special Inspector must be "Continuous" or "Periodic" in the 3rd column (in accordance with ICC-ES Report or LBO-approved equivalent; refer to IBC Section 1703.4, Performance), etc.**********

Required? Y/N	Inspection *[and/or Test]* Task	SI Frequency		Referenced Standard
		Continuous	Periodic	
[Y]	1. 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:	*[___]*	*[___]*	*[LANL ESM Ch. 16, Sect. IBC-GEN, para. 8.0]*
[Y]	a. Construction materials and systems that are alternatives to materials and systems prescribed by IBC.	*[___]*	*[___]*	
[Y]	b. Unusual design applications of materials described by IBC.	*[___]*	*[___]*	
[Y]	c. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in the IBC or in standards referenced by IBC.	*[___]*	*[___]*	
[Y]	*****The following item is a specific instance of example 1.c (above)***** 2. Any roofing work that exceeds patching less than 10% of total (true repair) except when managed by DOE central initiative (e.g., RAMP, BTA)		X	LBO-mandated

STRUCTURAL STEEL -- Special Inspection and Tests (1705.2.1)

********There is an Exception to IBC 1705.2, Steel construction, and there is an Exception to IBC 1705.2.1, Structural steel. If an Exception applies, it shall be indicated below the table. And the same goes for a justification for non-use of an applicable Exception.

AISC 360 Section N5.7, Other Inspection Tasks, requires inspection during placement of anchor rods. This is included in the Concrete table (1705.3) ********

Required? Y/N	Inspection *[and Test]* Task	SI Frequency		Referenced Standard[7]
		Continuous[8]	Periodic[9]	
[Y]	1. Inspection of fabricated items shall be made at the fabricator's plant.	Schedule such that interruption of fabricator's work is minimized		AISC 360 Section N5.2

[7] Where applicable (i.e., Section 1705.12, Special inspections for seismic resistance, and/or 1705.13, Testing for seismic resistance, may require additional inspections)
[8] In AISC 360, "P" is used, and requires that the task be performed for each welded joint or member, each bolted connection, or each steel element (as applicable)
[9] In AISC 360, "O" is used, and requires that the task be observed on a random basis. Operations need not be delayed pending these inspections

Y	2. Inspection of the erected steel system shall be made at the project site.	Schedule such that interruption of constructor's[10] work is minimized		
Y	3. Review the documents referred to in Table 1704.5 (herein) for compliance with the construction documents.	N/A		
	4. Observation of Welding Operations and Visual Inspection of In-process and Completed Welds:			
	a. Prior to Welding:			
[Y]	i. Welding procedure specifications (WPSs) available	X		AISC 360 Table N5.4-1, and AWS D1.1[11]
[Y]	ii. Manufacturer certifications for welding consumables available	X		
[Y]	iii. Material identification (type/grade)		X	
[Y]	iv. Welder identification system[12]		X	
[Y]	v. Fit-up of groove welds (including joint geometry) • Joint preparation • Dimensions (alignment, root opening, root face, bevel) • Cleanliness (condition of steel surface) • Tacking (tack weld quality and location) • Backing type and fit (if applicable)		X	
[Y]	vi. Configuration and finish of access holes		X	
[Y]	vii. Fit-up of fillet welds • Dimensions (alignment, gaps at root) • Cleanliness (condition of steel surface) • Tacking (tack weld quality and location)		X	
	b. During Welding:			
[Y]	i. Use of Qualified Welders		X	AISC 360 Table N5.4-2, and AWS D1.1
[Y]	ii. Control and Handling of Welding Consumables • Packaging • Exposure control		X	
[Y]	iii. No welding over cracked tack welds		X	
[Y]	iv. Environmental conditions • Wind speed within limits • Precipitation and temperature		X	
[Y]	v. WPS followed • Settings on welding equipment		X	

[10] In ASIC 360, "erector" is used
[11] For the specific line items within 4.a – 4.c, the applicable portions of AWS D1.1 can be found in the ASIC 360 Commentary, Tables C-N5.4-1 – C-N5.4-3. The only exception is line item 4.c.v, which isn't addressed in AWS D1.1. See Commentary Section A3.1c and Section J10.8 for k-area. Finally, AISC 360 Section J2, Welds, lists seven (7) instances in which AISC 360 'weld provisions' apply vs. AWS D1.1 provisions.
[12] The fabricator or constructor, 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.

	• Travel speed • Selected welding materials • Shielding gas type/flow rate • Preheat applied • Interpass temperature maintained (min./max.) • Proper position (F, V, H, OH)			
[Y]	vi. Welding techniques • Interpass and final cleaning • Each pass within profile limitations • Each pass meets quality requirements		X	
	c. After Welding			
[Y]	i. Welds cleaned		X	AISC 360 Table N5.4-3, and AWS D1.1
[Y]	ii. Size, length and location of welds	X		
[Y]	iii. Welds meet visual acceptance criteria • Crack prohibition • Weld/base–metal fusion • Crater cross section • Weld profiles • Weld size • Undercut • Porosity	X		
[Y]	iv. Arc strikes	X		
[Y]	v. k-area[13]	X		
[Y]	vi. Backing removed and weld tabs removed (if required)	X		
[Y]	vii. Repair activities	X		
[Y]	viii. Document acceptance or rejection of welded joint or member	X		
	5. NDT of Welded Joints **Subcontractor Scope Tests (3rd party)** - All NDT performed shall be documented in an NDT report: ▪ Shop Fabrication: Identify the tested weld by piece mark and location in the piece. ▪ Field Work: Identify the tested weld by location in the structure, piece mark and location in the piece. - When a weld is rejected on the basis of NDT, the report shall indicate the location of the defect and the basis of rejection *****Access Hole NDT shall be added to what follows if flange thickness of rolled shapes > 2", or if web thickness of built-up shapes > 2"***** *****Welded Joints Subjected to Fatigue shall also be added if the limit state of fatigue applies to members or connections IAW AISC 360 Appendix 3*****			
	a. CJP Groove Weld NDT			
[Y]	i. Structures in Risk Category (RC) II with butt, T- and corner joints	Perform Ultrasonic Testing		AISC 360 Section N5.5,

[13] When welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks within 3 in. of the weld.

	subject to transversely applied tension loading in materials ≥ 5/16"	(UT) on 10% of welds[14]		and AWS D1.1
[Y]	ii. Structures in RC III or IV with butt, T- and corner joints subject to transversely applied tension loading in materials ≥ 5/16" *****AISC 360 Sec. N5.5e allows for Reduction in the Rate of UT when, amongst many other circumstances, limitations, etc., at least 40 welds have been sampled for consideration of reduction. If this could be applicable, it shall be added as a separate line item under NDT of Welded Joints*****	Perform UT on 100% of welds		
	6. Inspection of High-Strength Bolting			
	a. Prior to Bolting			
[Y]	i. Manufacturer's certifications available for fastener materials	X		AISC 360 Table N5.6-1, and RCSC Specification[15]
[Y]	ii. Fasteners marked in accordance with ASTM requirements		X	
[Y]	iii. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)		X	
[Y]	iv. Proper bolting procedure selected for joint detail		X	
[Y]	v. Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements		X	
[Y]	vi. Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used[16]		X	
[Y]	vii. Proper storage provided for bolts, nuts, washers and other fastener components		X	
	b. During Bolting[17]			
[Y]	i. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required		X	AISC 360 Table N5.6-2, and RCSC Specification
[Y]	ii. Joint brought to the snug-tight condition prior to the pretensioning operation		X	
[Y]	iii. Fastener component not turned by the wrench prevented from rotating		X	
[Y]	iv. Fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point toward the free edges		X[18]	

[14] AISC 360 Section N5.5f requires 100% testing should the reject rate exceed 5% for an individual welder or welding operator. Refer to 'N5.5f' for additional details on reject rate, sampling requirements, etc.
[15] For the specific line items within 6.a and 6.b, the applicable portions of RCSC Spec can be found in the ASIC 360 Commentary, Tables C-N5.6-1and C-N5.6-2.
[16] Not applicable to snug-tight joints.
[17] Only ensuring that the faying surfaces are brought into firm contact is applicable to snug-tight joints.
[18] For pretensioned and slip-critical joints, when the installer is using the turn-of-nut method WITH matchmarking techniques, the direct-tension-indicator method, or the twist-off-type tension control bolt method, although proper/correct pretensioning must be monitored, the inspector need not be present during the installation of fasteners when these methods are used by the constructor.

	c. After Bolting			
[Y]	i. Document acceptance or rejection of bolted connections	X		AISC 360 Table N5.6-3
Y	7. Fabricated Steel or Erected Steel Frame (as appropriate, to verify compliance with the details shown on the construction documents): • Braces, stiffeners, member locations, proper application of joint details at each connection, etc.		X	AISC 360 Section N5.7
	8. Composite Construction			
	a. Steel Elements Prior to Concrete Placement			
[Y]	i. Placement and installation of steel deck[19]	X		AISC 360 Table N6.1
[Y]	ii. Placement and installation of steel headed stud anchors[20]	X		
[Y]	iii. Document acceptance or rejection of steel elements	X		

[19] Refer to AISC 360 Section N6 for the details associated with inspection of the attachment of steel deck (i.e., by welding and by fastening systems other than welding).
[20] The provisions of AWS D1.1 apply to welding of steel headed stud anchors.

CFS DECK -- Special Inspection and Qualification (1705.2.2)

Required? Y/N	Inspection Task	SI Frequency		Referenced Standard[21]
		Continuous[22]	Periodic[23]	
Y	1. Inspection of the deck shall be made at the project site.	Schedule such that interruption of constructor's work is minimized		SDI QA/QC Section 4.2.A
Y	2. Review the documents referred to in Table 1704.5 (herein) for compliance with construction documents.	N/A		SDI QA/QC Section 4.2.B
	3. Deck Installation			
	a. Prior to Deck Placement			
Y	i. Verify compliance of materials (deck and all accessories) with construction documents, including profiles, material properties, and base metal thickness	X		SDI QA/QC Appendix 1, Table 1.1
Y	ii. Document acceptance or rejection of deck and deck accessories	X		
	b. After Deck Placement			
Y	i. Verify compliance of deck and all deck accessories installation with construction documents	X		SDI QA/QC Appendix 1, Table 1.2; *[SDI C] [, and] [SDI NC] [, and] [SDI RD]*
Y	ii. Verify deck materials are represented by the mill certifications that comply with the construction documents	X		
Y	iii. Document acceptance or rejection of installation of deck and deck accessories	X		
	4. Welding of Deck			
	a. Prior to Welding			
[Y]	i. Welding procedure specifications (WPS) available		X	SDI QA/QC Appendix 1, Table 1.3; AWS D1.3; *[SDI C] [, and] [SDI NC] [, and] [SDI RD]*
[Y]	ii. Manufacturer certifications for welding consumables available		X	
[Y]	iii. Material identification (type/grade)		X	
[Y]	iv. Check welding equipment		X	
	b. During Welding			
[Y]	i. Use of qualified welders		X	SDI QA/QC Appendix 1, Table 1.4; AWS D1.3; *[SDI C] [, and] [SDI NC] [, and] [SDI RD]*
[Y]	ii. Control and handling of welding consumables		X	
[Y]	iii. Environmental conditions (wind speed, moisture, temperature)		X	
[Y]	iv. WPS followed		X	

[21] Where applicable (i.e., Section 1705.12, Special inspections for seismic resistance, may require additional inspections).
[22] In Steel Deck Institute (SDI) QA/QC, "P" is used, and requires that the task be performed prior to final acceptance for each item or element.
[23] In SDI QA/QC, "O" is used, and requires that the task/item be inspected on an intermittent basis. Operations need not be delayed pending these inspections.

	c. After Welding			
[Y]	i. Verify size and location of welds, including support, sidelap, and perimeter welds	X		SDI QA/QC Appendix 1, Table 1.5; AWS D1.3; *[SDI C] [, and] [SDI NC] [, and] [SDI RD]*
[Y]	ii. Welds meet visual acceptance criteria	X		
[Y]	iii. Verify repair activities	X		
[Y]	iv. Document acceptance or rejection of installation of welds	X		
	5. Mechanical Fastening of Deck			
	a. Prior to Mechanical Fastening			
[Y]	i. Manufacturer installation instructions available for mechanical fasteners		X	SDI QA/QC Appendix 1, Table 1.6; manufacturer's instructions; *[SDI C] [, and] [SDI NC] [, and] [SDI RD]*
[Y]	ii. Proper tools available for fastener installation		X	
[Y]	iii. Proper storage for mechanical fasteners		X	
	b. During Mechanical Fastening			
[Y]	i. Fasteners are positioned as required		X	SDI QA/QC Appendix 1, Table 1.7; manufacturer's instructions; *[SDI C] [, and] [SDI NC] [, and] [SDI RD]*
[Y]	ii. Fasteners are installed IAW manufacturer's instructions		X	
	c. After Mechanical Fastening			
[Y]	i. Check spacing, type, and installation of support fasteners	X		SDI QA/QC Appendix 1, Table 1.8; manufacturer's instructions; *[SDI C] [, and] [SDI NC] [, and] [SDI RD]*
[Y]	ii. Check spacing, type, and installation of sidelap fasteners	X		
[Y]	iii. Check spacing, type, and installation of perimeter fasteners	X		
[Y]	iv. Verify repair activities	X		
[Y]	v. Document acceptance or rejection of mechanical fasteners	X		

OPEN-WEB STEEL JOISTS and JOIST GIRDERS -- Special Inspection (1705.2.3)

Required? Y/N	Inspection Task	SI Frequency		Referenced Standard [24]
		Continuous	Periodic	
	1. Installation of open-web steel joists and joist girders.			
Y	a. End connections – welding or bolted.		X	SJI Standard Specification *[CJ] [JG] [K] [LH/DLH]*
	b. Bridging – horizontal or diagonal			
[Y]	i. Standard bridging.		X	SJI Std Spec *[CJ] [JG] [K] [LH/DLH]*

[24] Where applicable (i.e., Section 1705.12, Special inspections for seismic resistance, may require additional inspections)

[Y]	ii. Bridging that differs from the SJI specifications listed in Section 2207.1.		X	

CFS TRUSSES SPANNING ≥ 60 FEET-- Special Inspection (1705.2.4)

Required? Y/N	Inspection Task[25]
Y	Where a CFS truss clear span is ≥ 60 ft., verify that the temporary installation restraint /bracing and the permanent individual truss member restraint /bracing are installed IAW the approved truss submittal package.

CONCRETE CONSTRUCTION -- Special Inspections and Tests (1705.3)[26]

***** IBC 1705.3, Concrete construction, lists five (5) Exceptions. As a result of strengthening changes made by the NMAC (14.7.2.25) and thus followed by LANL, Exception 4 is deleted and Exception 3 shall read as follows: Nonstructural concrete slabs supported directly on the ground, except pre-stressed slabs-on-grade.

If an applicable Exception is invoked, indicate such below the table. And the same goes for justifying non-use of an applicable Exception.

If Exception 3 applies and is invoked, and the Project includes concrete that isn't exempt from special inspection, the EOR shall ensure that the drawings clearly distinguish between concrete that's exempt and concrete that isn't.

Regarding footnote 28, several adhesive-anchor ESRs have a Continuous-Special-Inspection subparagraph that includes a "proof loading program (PLP)." If such a product is used, and its ESR stipulates that continuous inspection is required (for the project-specific application) then the DPIRC shall develop a PLP and insert it herein (i.e., following the table below). For guidance on PLP development, refer to paragraph 4.4.2 of ESRs 1137 (and other ITW adhesive-anchor ESRs), 3218, 3584, 3608, and 3609.

It is recommended that proof loading be required for ML-3 and/or RC-IV adhesive anchors (i.e., regardless of the product used, and what's required by its ESR)

Task 4 (i.e., the inspection pertaining to post-installed anchors) isn't applicable to a seismically-exempt anchor even if there's an independent, 3rd-party evaluation report (e.g., ICC ES-ESR, etc.) requiring such. This follows from ESM Ch. 16 Sect. IBC-GEN, which indicates (in para. 8.0) that proprietary products are automatically approved when used in a seismically-exempt application. ******

Required? Y/N	Verification and Inspection Task	SI Frequency		Reference for Criteria	
		Continuous	Periodic	Referenced Standard[27]	IBC Reference
[Y]	1. Inspect rebar, including prestressing tendons, and verify placement.		X	ACI 318 Ch. 20,	Shotcrete: 1908.4

[25] Ibid
[26] In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in ACI 318 Chs. 19 and 20, LANL requires testing of materials IAW the appropriate standards and criteria for the material therein.
[27] Where applicable (i.e., Section 1705.12, Special inspections for seismic resistance, may require additional inspections).

				25.2, 25.3, 26.5.1-26.5.3	
[Y]	2. Rebar welding: a. Verify weldability of rebar other than ASTM A 706; b. Inspect single-pass fillet welds ≤ 5/16″; and c. Inspect all other welds.	X	X X	AWS D1.4 ACI 318: 26.5.4	
[Y]	3. Inspect anchors cast in concrete	.	X	ACI 318: 17.8.2 AISC 360 N5.7[28]	
[Y]	4. Inspect anchors post-installed in hardened concrete members.[29] 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	
[Y]	5. Verify use of required design mix.		X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2; Shotcrete: 1908.2, 1908.3
[Y]	6. **Subcontractor Scope Tests (3rd party):** Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X		ASTM C 172 ASTM C 31 ACI 318: 26.5, 26.12	Shotcrete: 1908.10
[Y]	7. Inspect concrete and shotcrete placement for proper application techniques.	X		ACI 318: 26.5	Shotcrete: 1908.6, 1908.7, 1908.8
[Y]	8. Verify maintenance of specified curing temperature and techniques.		X	ACI 318: 26.5.3 – 5.5	Shotcrete: 1908.9
[Y]	9. Inspect prestressed concrete for: a. Application of prestressing forces; and b. Grouting of bonded prestressing tendons.	X X		ACI 318: 26.9.2.1 ACI 318: 26.9.2.3	
[Y]	10. Inspect erection of precast concrete members.		X	ACI 318: 26.8	
[Y]	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: 26.10.2	
[Y]	12. Inspect formwork for shape, location and dimensions of the concrete member being formed.		X	ACI 318: 26.10.1(b)	

[28] AISC 360 Section N5.7 requires inspection of the protrusion of the threaded ends through the connected material (i.e., it must be sufficient to fully engage the threads of the nuts, but not be greater than the length of the threads on the bolts).
[29] 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. Special inspection isn't applicable to seismically-exempt anchors (even if/when a research report says it is).

MASONRY CONSTRUCTION -- Special Inspections and Tests (1705.4)

****

There are three (3) Exceptions to IBC 1705.4, Masonry construction. Empirically designed masonry, referred to in Exception 1, is N/A at LANL (ref. TMS 402 App. A, para. A.1.2.2). All of Exception 3 is N/A at LANL. If an Exception applies, it shall be indicated below the table. And the same goes for a justification for non-use of an applicable Exception.

The special-inspection-and-test provisions pertaining to glass unit masonry or masonry veneer in IBC 1705.4.1, and those pertaining to vertical masonry foundation elements in IBC 1705.4.2, are not included herein since these types of masonry are rarely used at LANL. What follows shall be edited accordingly if /when a project includes these types of masonry.

Given the content of the first two notes, and the fact that prescriptive design of masonry partition walls is prohibited at LANL (ref. TMS 402 Ch.14, para. 14.2.3.3), TMS 402 Level A Quality Assurance (QA) is not included herein. If /when a project includes prescriptive design of glass unit masonry or masonry veneer in an RC I – III structure, use of Level A QA should be considered.

TMS Ch. 3, Sect. 3.2, Construction considerations, includes design requirements for minimum spaces for grouting (para. 3.2.1) and for embedded conduits pipes and sleeves (para. 3.2.2). The reason for mentioning these requirements here is, whether a design complies with these requirements or not, additional inspections and tests may be required during construction. See 3.2.1 and 3.2.2 for more detail.

Although use of autoclaved aerated concrete (AAC) is permissible, and IBC 1705.4 includes associated inspections and tests, tables below don't included them since use of AAC at LANL is extremely rare (if at all). If AAC is to be used, the required inspections and tests shall be edited into the appropriate table(s).

****

MASONRY – LEVEL B QUALITY ASSURANCE

*****From TMS 402 Table 3.1.2, which applies to masonry in RC I–III structures that is designed IAW TMS 402 chapters other than those in Part 4 (i.e., Prescriptive Design) or Appendix A (i.e., Empirical Design). If Level B applies then constructor compliance with TMS 602 Table 4 shall be mandated in project masonry spec section*****

Required? Y/N	Inspection and Test Task	SI Frequency		Referenced Standard	
		Continuous	Periodically	TMS 402	TMS 602
[Y]	1. Verification of slump flow and Visual Stability Index (VSI) as delivered to the project site for self-consolidating grout.	X			Art. 1.5B.1.b.3
Y	2. Verification of f'_m prior to construction except where specifically exempted by TMS 402[30].	X			Art. 1.4B
Y	3. Verify compliance with the approved submittals.		X		Art. 1.5
	4. As masonry construction begins, verify that the following are in compliance:				
[Y]	a. Proportions of site-prepared mortar.		X		Art. 2.1, 2.6A
Y	b. Construction of mortar joints.		X		Art. 3.3B

[30] The exemption applies to Prescriptive Design of glass unit masonry, veneer masonry, masonry partition walls; and Empirical Design of Masonry. The latter two (2) of these four (4) types of design are prohibited at LANL. And, since this template is not written for use with the non-prohibited designs, this verification is Required.

[Y]	c. Grade and size of prestressing tendons and anchorages.		X		Art. 2.4B, 2.4H
Y	d. Location of reinforcement, connectors, prestressing tendons and anchorages.		X		Art. 3.4, 3.6A
[Y]	e. Prestressing technique.		X		Art. 3.6B
	5. Prior to grouting, verify that the following are in compliance:				
Y	a. Grout space.		X		Art. 3.2D, 3.2F
Y	b. Grade, type, and size of rebar and anchor bolts, prestressing tendons and anchorages.		X	Sec. 6.1	Art. 2.4, 3.4
Y	c. Placement of rebar, connectors, and prestressing tendons and anchorages.		X	Sec. 6.1, 6.2.1, 6.2.6, 6.2.7	Art. 3.2E, 3.4, 3.6A
[Y]	d. Proportions of site-prepared grout and prestressing grout for bonded tendons.	-	X		Art. 2.6B, 2.4G.1.b
Y	e. Construction of mortar joints.		X		Art. 3.3B
	6. Verify during construction				
Y	a. Size and location of structural elements.		X		Art. 3.3F
Y	b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.		X	Sec. 1.2.1(e), 6.1.4.3, 6.2.1	
[Y]	c. Welding of rebar.	X		Sec. 8.1.6.7.2, 9.3.3.4(c), 11.3.3.4(b)	
[Y]	d. Preparation, construction, and protection of masonry during cold weather (temperature < 40°F) or hot weather (temperature > 90°F).		X		Art. 1.8C, 1.8D
[Y]	e. Application and measurement of prestressing force.	X			Art. 3.6B
Y	f. Placement of grout and prestressing grout for bonded tendons	X			Art. 3.5, 3.6C
Y	7. **Subcontractor Scope Tests (3rd party):** Observe preparation of grout specimens, mortar specimens, and/or prisms.		X		Art. 1.4B.2.a.3, 1.4B.2.b.3, 1.4B.2.c.3, 1.4B.3, 1.4B.4

MASONRY – LEVEL C QUALITY ASSURANCE

*****From TMS 402 Table 3.1.3, which applies to masonry in RC IV structures that is designed IAW TMS 402 chapters other than those in Part 4 (i.e., Prescriptive Design) or Appendix A (i.e., Empirical Design). If Level C applies then constructor compliance with TMS 602 Table 5 shall be mandated in project masonry spec section*****

Required? Y/N	Inspection and Test Task	LSI		Referenced Standard	
		Continuous	Periodic	TMS 402	TMS 602
Y	1. Verification of f '$_m$ and prior to construction and for every 5,000 square feet during construction.	X[31]			Art. 1.4B
[Y]	2. Verification of proportions of materials in premixed or preblended mortar, prestressing grout, and grout other than self-consolidating grout, as delivered to the project site.	X			
[Y]	3. Verification of slump flow and Visual Stability Index (VSI) as delivered to the project site for self-consolidating grout.	X			Art. 1.5B.1.b.3
Y	4. Verify compliance with the approved submittals.		X		Art. 1.5
	5. Verify that the following are in compliance:				
[Y]	a. Proportions of site-mixed mortar, grout and prestressing grout for bonded tendons.		X		Art. 2.1, 2.6A, 2.6B, 2.6C, 2.4G.1.b
Y	b. Grade, type, and size of rebar and anchor bolts, prestressing tendons and anchorages.		X	Sec. 6.1	Art. 2.4, 3.4
Y	c. Placement of masonry units and construction of mortar joints.		X		Art. 3.3B
Y	d. Placement of rebar, connectors, prestressing tendons and anchorages.		X	Sec. 6.1, 6.2.1, 6.2.6, 6.2.7	Art. 3.2E, 3.4, 3.6A
Y	e. Grout space prior to grouting.	X			Art. 3.2D, 3.2F
Y	f. Placement of grout and prestressing grout for bonded tendons	X			Art. 3.5, 3.6C
Y	g. Size and location of structural elements.		X		Art. 3.3F
Y	h. Type, size and location of anchors including other details of anchorage of masonry to structural members, frames or other construction.	X		Sec. 1.2.1(e), 6.1.4.3, 6.2.1	
[Y]	i. Welding of rebar.	X		Sec. 8.1.6.7.2, 9.3.3.4(c), 11.3.3.4(b)	
[Y]	j. Preparation, construction, and protection of masonry during cold weather (temperature < 40°F) or hot weather (temperature > 90°F).		X		Art. 1.8C, 1.8D
[Y]	k. Application and measurement of prestressing force.	X			Art. 3.6B
Y	6. **Subcontractor Scope Tests (3rd party):** Observe preparation of grout specimens, mortar specimens, and/or prisms.	X			Art. 1.4B.2.a.3, 1.4B.2.b.3, 1.4B.2.c.3, 1.4B.3, 1.4B.4

[31] Compressive strength of masonry shall be considered satisfactory if the compressive strength of each masonry wythe and grouted collar joint equals or exceeds the value of *f 'm*.

SOILS -- Special Inspections and Test (1705.6)

*****There is an Exception to IBC 1705.6, Soils, and it pertains to IBC 1805.3.8, Compacted fill material, which only applies when > 12 inches of fill is to be used (i.e., If fill depth is ≤ 12" then geotechnical reporting of fill materials and procedures isn't required. The Exception requires the inspector to verify that the in-place dry density of the compacted fill is ≥ 90% of the maximum dry density at optimum moisture content determined IAW ASTM D1557. If the Exception applies, it shall be included in the table below by editing line items 3 and 4. In lieu of this, a justification for non-use of the Exception shall be provided below the table*****

Required? Y/N	Inspection *[and Test}* Task	SI Frequency		Referenced Standard
		Continuous	Periodic	
Y	1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.		X	Approved geotechnical report, construction documents[32]
[Y]	2. Verify excavations are extended to proper depth and have reached proper material.		X	
[Y]	3. **Subcontractor Scope Tests (3rd party)**: Perform classification and testing of compacted fill materials		X	
[Y]	4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X		
[Y]	5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.		X	

FABRICATED STRUCTURAL ITEMS -- Special Inspection (1705.10)

*****Compliance with IBC 1704.2.5 is required; there are two (2) Exceptions therein, the latter of which is footnoted. If an Exception applies, DO NOT delete the table, rather A) Put "N" in column 1, and B) Footnote the "N" with the applicable Exception*****

Required? Y/N[33]	Inspection Task	SI Frequency	
		Continuous	Periodic
[Y]	1. 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.	----	X

[32] Only the provisions of the approved geotech report (AGR) shall be used for line item #4. In addition, the use of any/all fill-placement procedures indicated in AGR shall be verified.

[33] Special Inspections during fabrication of 'structural items' are not required where the work is done on the premises of a fabricator registered and approved by the LBO to perform such work without special inspection in accordance with IBC Section 1704.2.5.1 and ESM Chapter 16. However, as indicated herein (in Table 1704.5, Reports and Certificates), CoCs for such work must be submitted.

SEISMIC RESISTANCE -- Special Inspection (1705.12)

*****There are three (3) Exceptions to IBC 1705.12, Special inspections for seismic resistance; however, none of them are applicable at LANL. Seismic isolation systems are not included since they have not been used at LANL. In the event that a project includes these then this table shall be edited in accordance with IBC 1705.12.8. If Inspection Tasks 1.a or 1.b apply, Appendix A herein (i.e., 'templatized-version' of AISC 341 Chapter J) must be included in SSI*****

Required? Y/N	Inspection Task	SI Frequency		Referenced Standard
		Continuous	Periodic	
	1. Structural steel			
[Y]	*****The Exception to IBC 1705.12.1.1 is N/A at LANL***** a. Inspect structural steel in the SFRS*[s]*	Refer to Appendix A herein		Appendix A herein
[Y]	*****The Exception to IBC 1705.12.1.2 is N/A at LANL***** b. Inspect structural steel elements in the SFRS*[s]* other than those covered in item 1.a including struts, collectors, and chords			
	2. CFS light-frame construction[34]			
[Y]	a. Inspect welding operations of elements of the SFRS*[s]*		X	
[Y]	*****There is an Exception to IBC 1705.12.3.2. If the Exception applies, line item 2.b is not required (i.e., "N"), and this shall be noted below the table. If the Exception applies and isn't used, justification shall be provided below the table***** b. Inspect screw attachment, bolting, anchoring, and other fastening of elements of the SFRS including shear walls, braces, diaphragms, collectors /drag struts, and hold-downs.		X	
	3. DSSs[35]			
[Y]	a. Examine active mechanical and electrical components[36] that have to remain operable following the design earthquake ground motion and verify that the label, anchorage and mounting conform to the CoC	X		ASCE 7 Chapter 13, 13.2.2.1
[Y]	b. Examine components that convey, support, or otherwise contain toxic, highly toxic, or explosive substances, and that have to maintain containment following the design earthquake ground motion[37] and verify that the label, anchorage and mounting conform to the CoC	X		ASCE 7 Chapter 13, 13.2.2.2
	4. Architectural Components			
	a. Erection and fastening of the following:			
[Y]	i. Exterior cladding at height > 30 feet above grade or walking surface, or that weighs > 5 psf		X	

[34] Per IBC Section 202: Vertical and horizontal structural elements are primarily formed by a system of repetitive CFS framing members
[35] Those nonstructural components that require design IAW ASCE 7 Chapter 13 and for which the component importance factor, *Ip*, is > 1.0
[36] Active components/equipment have parts that rotate, move mechanically, or are energized during operation
[37] The key words and phrases herein are defined in IBC Section 202. In order to be a DSS, the quantity of a hazardous substance associated with a component must exceed a particular threshold. If such a component is included in a project, it should be identified in an analysis of some sort (e.g., hazard, preliminary hazard, safety, etc.).

[Y]	ii. Interior and exterior nonbearing walls of height > 30 feet above grade or walking surface; or, in the case of interior nonbearing walls, weighing > 15 psf		X	
[Y]	iii. Interior and exterior veneer at height > 30 feet above grade or walking surface, or that weighs > 5 psf		X	
[Y]	b. Anchorage of access floors		X	
	5. Plumbing, Mechanical and Electrical Components:			
[Y]	a. Anchorage of electrical equipment for emergency and standby power systems.		X	
[Y]	b. Installation and anchorage of piping systems designed to carry hazardous materials[38] and their associated mechanical units.		X	
[Y]	c. Installation and anchorage of HVAC ductwork designed to carry hazardous materials		X	
[Y]	d. Installation and anchorage of vibration isolation systems where the construction documents require a nominal clearance ≤ 1/4" between the equipment support frame and restraint.		X	
	6. Storage Racks			
[Y]	a. Anchorage of storage racks ≥ 8 feet in height		X	
	7. CFS special bolted moment frame (SBMF)			
[Y]	a. Installation of CFS SBMF*[s]* in the SFRS*[s]*		X	

SEISMIC RESISTANCE -- Testing (1705.13)

*****Seismic isolation systems are not included since they have not been used at LANL. In the event that a project includes these then this table shall be edited in accordance with IBC 1705.13.4. If Test Tasks 1.a or 1.b apply, then Appendix A herein (i.e., 'templatized-version' of AISC 341 Chapter J) must be included in SSI.*****

Required Y/N	Test Task	SI Frequency		Referenced Standard
		Continuous	Periodic	
	1. Structural steel			
[Y]	*****The Exception to IBC 1705.13.1.1 is N/A at LANL***** a. NDT of structural steel in the SFRS*[s]*	Refer to Appendix A herein		Appendix A herein
[Y]	*****The Exception to IBC 1705.13.1.2 is N/A at LANL***** b. NDT of structural steel elements in the SFRS*[s]* other than those covered in item 1.a including struts, collectors, and chords			

[38] Defined in IBC Sect. 202

	2. Nonstructural components		
[Y]	*****The DPIRC shall specify on the construction documents the requirements for seismic qualification by analysis, testing, or experience data ***** a. Examine/verify CoC*[s]* (from Table 1704.5 herein) for nonstructural components, supports or attachments seismically qualified by analysis, testing, or experience data	X	ASCE 7 Chapter 13, 13.2.1.2
	3. DSSs		
[Y]	*****The DPIRC shall specify on the construction documents the requirements to be met by analysis, testing, or experience data as specified in ASCE 7, 13.2.2 ***** a. Examine/verify CoC*[s]* (from Table 1704.5 herein) for certification of DSSs by analysis, testing, or experience data	X	ASCE 7 Chapter 13, 13.2.2

SPRAYED FIRE-RESISTANT MATERIALS -- Special Inspection and Tests (1705.14)

Required Y/N	Verification and Inspection Task	Inspection Frequency		Reference for Criteria	
		Continuous During Task Listed	Periodically During Task Listed	Referenced Standard	IBC Reference
[Y]	1. Sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members per Sections 1705.14.2 through 1705.14.6, performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.	----	X	----	1705.14
	2. Perform the following physical and visual tests:				
[Y]	a. Condition of substrates	----	X	----	1705.14
	b. Thickness of application				
	c. Density in pounds per cubic foot				
	d. Bond strength adhesion/cohesion				
	e. Condition of finished application				

MASTIC AND INTUMESCENT FIRE-RESISTANT COATINGS -- Special Inspection and Test (1705.15)

Required Y/N	Verification and Inspection Task	Inspection Frequency		Criteria Reference	
		Continuous During Task Listed	Periodically During Task Listed	Referenced Standard	IBC Reference
[Y]	1. Coatings applied to structural elements and decks in accordance with AWCI 12-B.	----	X	AWCI 12-B	1705.15

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) -- Special Inspection and Verification (1705.16)

Required Y/N	Verification and Inspection Task	Inspection Frequency		Reference for Criteria	
		Continuous During Task Listed	Periodically During Task Listed	Referenced Standard	IBC Reference
[Y]	1. Required for all EIFS applications except those over a water-resistive barrier with a means of draining moisture to the exterior or EIFS over masonry or concrete walls.	----	X	----	1705.16
[Y]	2. Water-resistive barrier coating complying with ASTM E 2570 requires special inspection of the water-resistive barrier coating when installed over sheathing substrate.	----	X	ASTM E 2570	1705.16.1

FIRE-RESISTANT PENETRATIONS AND JOINTS -- Special Inspection and Verification (1705.17)

Required Y/N	Verification and Inspection Task	Inspection Frequency		Reference for Criteria	
		Continuous During Task Listed	Periodically During Task Listed	Referenced Standard	IBC Reference
	In Risk Category III and IV (and high rise buildings), inspect :				
[Y]	1. Penetration firestops listed and tested per Sect. 714.3.1.2 and 714.4.1.2	----	X	ASTM E 2174	1705.17.1
[Y]	2. Fire-resistant joint and perimeter fire barrier systems listed and tested per Sect. 715.3 and 715.4	----	X	ASTM E 2393	1705.17.2

SMOKE CONTROL -- Special Inspection and Verification (1705.18)

Special Inspection Required Y/N	Verification and Inspection Task	Inspection Frequency		Reference for Criteria	
		Continuous During Task Listed	Periodically During Task Listed	Referenced Standard	IBC Reference
	1. Smoke Control Testing Scope by agencies qualified per 1705.18.2				
[Y]	a. During erection of ductwork and prior to concealment for the purpose of leakage testing and recording of device location.	----	----	----	1705.18
	b. Prior to occupancy and after sufficient completion for the purpose of pressure difference testing, flow measurements and detection and control verification.				

Instructions – SSI Preparation

1. Who Prepares the Plan:
   The program of special inspection and testing for a project shall be prepared by the Design Professional in Responsible Charge (DPIRC) that is in responsible charge of the building system requiring inspections and testing. The Structural Engineer of Record (SER) should prepare the sections required for the structural elements such as foundations, concrete, structural steel, etc. The Architect and MEP Engineers of Record should prepare the corresponding sections of the SSI for the building systems that they are responsible for, etc. For further explanation, refer to LANL ESM Chapter 16, Section IBC-IP.

2. The Front Pages:
   2-1. At the top of the page indicate the project name and location as they appear on the Contract Documents, and indicate the Design Professional in Responsible Charge. This should be the DPIRC in responsible charge of the building systems for which this SSI is being prepared. See explanation in item 1 above.

   2-2. Read the first paragraph and check the box below indicating the discipline(s) that this SSI will encompass (Structural, Architectural, Mechanical/Electrical/Plumbing, or Other).

   2-3 The DPIRC must review section 1704 in Chapter 17 of the IBC to determine if the project requires a Structural Observations for seismic resistance.

   2-4. If the aforementioned 'observations' are required, the DPIRC must indicate this by appending the associated form to the SSI. Finally, the DPIRC must complete the portions of the appended form within his/her purview

3. Signature Page:
   3-1. At the top of the page, the DPIRC must print, sign, and date the form, and stamp the form with their professional seal in the box provided.

   3-2. LANL must sign and date the page after the SSI has been completed by the DPIRC.

   3-3. LANL must sign and date the form again upon acceptance.

4. Schedule of Inspection and Testing Agencies Page:
   4-1. The page lists all of the categories of building systems with a box next to each. The DPIRC must check the boxes for only the building systems that are going to be covered in this SSI. A completed inspection and/or test table must be included for each building system that is checked off (see instruction #6 below).

5. Identification of Items Subject to Special Inspections and Tests for Seismic Resistance Page:
   5-1. The DPIRC must review sections 1704 and 1705 in Chapter 17 of the IBC to determine if the project requires a Statement of Responsibility from the Subcontractor for special inspections and tests for seismic resistance.

   5-2. If the aforementioned 'statement' is required, the DPIRC must indicate this, to include listing the applicable items, and appending the Subcontractor's Statement of Responsibility form to the SSI. Finally, the DPIRC must complete the portions of the appended form within his/her purview.

6. Inspection and/or Test Tables for Each Building System:
   6-1. There is a table attached for each building system where the DPIRC identifies the inspection and /or test requirements of each system. Fill out the tables for only the building systems included in this SSI.

   6-2. Where indicated (in italics), whether or not a given inspection /test is required must be filled in (i.e., Y or N) by the DPIRC. The inspection/test tasks are the mandated minimum inspection requirements designated by the IBC Chapter 1. The DPIRC is alerted to IBC exceptions, and LANL omissions of IBC provisions (due to rare applicability), through the use of 'author notes.' The DPIRC must determine whether or not a given exception /omission applies and amend the required inspections/tests accordingly. The final scope of the inspections required for the project must be determined by the DPIRC **but shall not be less than those required by IBC Chapter 17.**

   6-3. Descriptions of all inspections/tests must include the required location of the special inspector /frequency of each inspection or test (i.e., continuous or periodic).

   6-4. Notes of clarification may be included below the relevant building systems table.

   6-5. If the SSI includes Table 1705.12 and/or 1705.13, and the table, in turn, includes special inspections/tests for structural steel then DPIRC must append Appendix A to the SSI.

Statement of Special Inspections
Appendix A

QUALITY CONTROL AND QUALITY ASSURANCE PLAN
FOR SEISMIC FORCE-RESISTING SYSTEMS AND RELATED STRUCTURAL STEEL ELEMENTS

This appendix addresses requirements for quality control and quality assurance; however, only the quality assurance requirements apply to the SSI (i.e., in order to satisfy/fulfill the intent of SSI Tables 1705.12 and 1705.13). Accordingly, the quality assurance requirements are highlighted yellow.

User Note: IBC 1705.12 and 1705.13 require that only the quality assurance requirements of AISC 341 (Chapter J) apply to the IBC Special Inspections and Tests; however, for context, the AISC 341 quality control provisions are also included.

All quality assurance requirements of AISC 360 Chapter N also apply, unless specifically modified by this Plan.

Finally, AISC 341 Chapter J Section J10, Inspection of Piling is not included since structural steel piling (i.e., H-piles) is rarely used at LANL.

This attachment is organized as follows:

TERMS

EOR	Engineer of record. Whenever term is used, EOR's designee is also acceptable.
IBC	*International Building Code*, as amended by LANL
LBO	LANL Building Official
NDT	nondestructive testing
QA	quality assurance
QC	quality control
SFRS	seismic force resisting system
AISC 360	AISC *Specification for Structural Steel Buildings* (ANSI/AISC 360)

Italics are used to highlight titles or terms defined by the IBC or AISC 341.

In tables, P = perform, O = observe, and D = document (per J5 1-3)

J1. SCOPE

Quality Control (QC) as specified in this attachment shall be provided by the fabricator, erector or other responsible Subcontractor as applicable. *Quality Assurance* (QA) as specified in this attachment shall be provided by others when required by the *LANL Building Official (LBO), International Building Code (IBC),* or *engineer of record* (EOR). Nondestructive testing (NDT) shall be performed by the LBO-approved testing agency retained by the Subcontractor or Subtiers, except as permitted in accordance with *AISC 360* Section N7.

User Note: The quality assurance plan of this section is considered adequate and effective for most *seismic force resisting systems (SFRS)* and should be used without modification. The *quality assurance plan* is intended to ensure that the SFRS is significantly free of defects that would greatly reduce the ductility of the system. There may be cases (for example, non-redundant major transfer members, or where work is performed in a location that is difficult to access) where supplemental testing might be advisable. Additionally, where the fabricator's or erector's quality control program has demonstrated the capability to perform some tasks this plan has assigned to quality assurance, modification of the plan could be considered.

J2. FABRICATOR AND ERECTOR DOCUMENTS

1. Documents to be Submitted for Steel Construction

In addition to the requirements of *AISC 360* Section N3.1, the following documents shall be submitted for review by the *EOR* prior to fabrication or erection of the affected work, as applicable:

(1) Welding procedure specifications (WPS)

(2) Copies of the manufacturer's typical certificate of conformance for all electrodes, fluxes and shielding gasses to be used

(3) For *demand critical welds*, applicable manufacturer's certifications that the filler metal meets the supplemental notch toughness requirements, as applicable. Should the filler metal manufacturer not supply such supplemental certifications, the fabricator or erector, as applicable, shall have the necessary testing performed and provide the applicable test reports

(4) Manufacturer's product data sheets or catalog data for SMAW, FCAW and GMAW composite (cored) filler metals to be used

(5) Bolt installation procedures

(6) Specific assembly order, welding sequence, welding technique, or other special precautions for joints or groups of joints where such items are designated to be submitted to the EOR.

2. Documents to be Available for Review for Steel Construction

Additional documents as required by the EOR in the Subcontract documents shall be available by the fabricator and erector for review by the *EOR* prior to fabrication or erection, as applicable.

The fabricator and erector shall retain their document(s) for at least one year after substantial completion of construction.

3. Documents to be Submitted for Composite Construction

The following documents shall be submitted by the responsible Subcontractor for review by the *EOR* prior to concrete production or placement, as applicable:

(1) Concrete mix design and test reports for the mix design

(2) Reinforcing steel shop drawings

(3) Concrete placement sequences, techniques and restriction

4. Documents to be Available for Review for Composite Construction

The following documents shall be available from the responsible Subcontractor for review by the *EOR* prior to fabrication or erection, as applicable, unless specified to be submitted:

(1) Material test reports for reinforcing steel

(2) Inspection procedures

(3) Nonconformance procedure

(4) Material control procedure

(5) Welder performance qualification records (WPQR) as required by AWS D1.4/D1.4M

(6) QC Inspector qualifications

The responsible Subcontractor shall retain their document(s) for at least one year after substantial completion of construction.

J3. QUALITY ASSURANCE AGENCY DOCUMENTS

The agency responsible for quality assurance (QA) shall submit the following documents to the EOR and *LBO* for approval*:*

(1) QA agency's written practices for the monitoring and control of the agency's operations. The written practice shall include:

(i) The agency's procedures for the selection and administration of inspection personnel, describing the training, experience and examination requirements for qualification and certification of inspection personnel, and

(ii) The agency's inspection procedures, including general inspection, material controls, and visual welding inspection

(2) Qualifications of management and QA personnel designated for the project

(3) Qualification records for inspectors and NDT technicians designated for the project

(4) NDT procedures and equipment calibration records for NDT to be performed and equipment to be used for the project

(5) For composite construction, concrete testing procedures and equipment

J4. INSPECTION AND NONDESTRUCTIVE TESTING PERSONNEL

In addition to the requirements of *AISC 360* Sections N4.1 and N4.2, visual welding inspection and nondestructive testing (NDT) shall be conducted by personnel qualified in accordance with AWS D1.8 clause 7.2. In addition to the requirements of *AISC 360* Section N4.3, ultrasonic testing technicians shall be qualified in accordance with AWS D1.8 clause 7.2.4.

J5. INSPECTION TASKS

Inspection tasks and documentation for quality control (QC) and QA for the *seismic force resisting system* (SFRS) shall be as provided in the tables in Sections J6, J7, J8, and J9. The following entries are used in the tables:

1. Observe (O)

The inspector shall observe these functions on a random, daily basis. Operations need not be delayed pending observations.

2. Perform (P)

These inspections shall be performed prior to the final acceptance of the item.

3. Document (D)

The inspector shall prepare reports indicating that the work has been performed in accordance with the Subcontract documents. The report need not provide detailed measurements for joint fit-up, WPS settings, completed welds, or other individual items listed in the tables. For shop fabrication, the report shall indicate the piece mark of the piece inspected. For field work, the report shall indicate the reference grid lines and floor or elevation inspected. Work not in compliance with the Subcontract documents and whether the noncompliance has been satisfactorily repaired shall be noted in the inspection report.

4. Coordinated Inspection

Where a task is noted to be performed by both QC and QA, coordination of the inspection function between QC and QA is permitted in accordance with *AISC 360* Section N5.3.

J6. WELDING INSPECTION AND NONDESTRUCTIVE TESTING

Welding inspection and nondestructive testing shall satisfy the requirements of *AISC 360*, this section and AWS D1.8.

User Note: AWS D1.8 was specifically written to provide additional requirements for the welding of *SFRS*, and has been coordinated when possible with this plan. AWS D1.8/D1.8M requirements related to inspection and nondestructive testing are organized as follows, including normative (mandatory) annexes:

1. General Requirements

7. Inspection

Annex F. Supplemental Ultrasonic Technician Testing
Annex G. Supplemental Magnetic Particle Testing Procedures
Annex H. Flaw Sizing by Ultrasonic Testing

1. Visual Welding Inspection

All requirements of *AISC 360* shall apply, except as specifically modified by AWS D1.8.

Visual welding inspection shall be performed by both QC and QA personnel. As a minimum, tasks shall be as listed in Tables J6-1, J6-2, and J6-3.

TABLE J6-1
Visual Inspection Tasks Prior to Welding

Visual Inspection Tasks Prior to Welding	QC		QA	
	Task	Doc.	Task	Doc.
Material identification (Type/Grade)	O	–	O	–
Welder identification system	O	–	O	–
Fit-up of Groove Welds (including joint geometry) - 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)	P/O**	–	O	–

Configuration and finish of access holes	O	–	O	–
Fit-up of Fillet Welds - Dimensions (alignment, gaps at root) - Cleanliness (condition of steel surfaces) - Tacking (tack weld quality and location)	P/O**	–	O	–
** Following performance of this inspection task for ten welds to be made by a given welder, with the welder demonstrating understanding of requirements and possession of skills and tools to verify these items, the Perform designation of this task shall be reduced to Observe, and the welder shall perform this task. Should the inspector determine that the welder has discontinued performance of this task, the task shall be returned to Perform until such time as the Inspector has re-established adequate assurance that the welder will perform the inspection tasks listed.				

TABLE J6-2
Visual Inspection Tasks During Welding

Visual Inspection Tasks During Welding	QC		QA	
	Task	Doc.	Task	Doc.
WPS followed - Settings on welding equipment - Travel speed - Selected welding materials - Shielding gas type/flow rate - Preheat applied - Interpass temperature maintained (min/max.) - Proper position (F, V, H, OH) - Intermix of filler metals avoided unless approved	O	–	O	–
Use of qualified welders	O	–	O	–
Control and handling of welding consumables - Packaging - Exposure control	O	–	O	–
Environmental conditions - Wind speed within limits - Precipitation and temperature	O	–	O	–
Welding techniques - Interpass and final cleaning - Each pass within profile limitations - Each pass meets quality requirements	O	–	O	–
No welding over cracked tacks	O	–	O	–

TABLE J6-3 Visual Inspection Tasks After Welding				
Visual Inspection Tasks After Welding	**QC**		**QA**	
	Task	**Doc.**	**Task**	**Doc.**
Welds cleaned	O	–	O	–
Size, length, and location of welds	P	–	P	–
Welds meet visual acceptance criteria - Crack prohibition - Weld/base-metal fusion - Crater cross section - Weld profiles and size - Undercut - Porosity	P	D	P	D
Placement of reinforcing or contouring fillet welds (if required)	P	D	P	D
Backing removed, weld tabs removed and finished, and fillet welds added (if required)	P	D	P	D
Repair activities	P	–	P	D

2. NDT of Welded Joints

In addition to the requirements of *AISC 360* Section N5.5, nondestructive testing of welded joints shall be as required in this section:

2a. *k*-Area NDT

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 in. of the weld. The MT shall be performed no sooner than 48 hours following completion of the welding.

2b. CJP Groove Weld NDT

Ultrasonic testing (UT) shall be performed on 100% of CJP groove welds in materials $^{5}/_{16}$ in. thick or greater. Ultrasonic testing in materials less than $^{5}/_{16}$ in. thick is not required. Weld discontinuities shall be accepted or rejected on the basis of criteria of AWS D1.1 Table 6.2. Magnetic particle testing shall be performed on 25% of all beam-to-column CJP groove welds. The rate of UT and MT is permitted to be reduced in accordance with Sections J6.2g and J6.2h, respectively.

Exception: For *ordinary moment frames*, UT and MT of CJP groove welds are required only for *demand critical welds*.

2c. Base Metal NDT for Lamellar Tearing and Laminations

After joint completion, base metal thicker than 1^1/2 in. loaded in tension in the through-thickness direction in tee and corner joints, where the connected material is greater than 3/4 in. and contains CJP groove welds, shall be ultrasonically tested for discontinuities behind and adjacent to the fusion line of such welds. Any base metal discontinuities found within *t*/4 of the steel surface shall be accepted or rejected on the basis of criteria of AWS D1.1 Table 6.2, where *t* is the thickness of the part subjected to the through-thickness strain.

2d. Beam Cope and Access Hole NDT

At welded splices and connections, thermally cut surfaces of beam copes and access holes shall be tested using magnetic particle testing or penetrant testing, when the flange thickness exceeds 1-1/2 in. for rolled shapes, or when the web thickness exceeds 1-1/2 in. for built-up shapes.

2e. Reduced Beam Section Repair NDT

Magnetic particle testing shall be performed on any weld and adjacent area of the *reduced beam section* (RBS) cut surface that has been repaired by welding, or on the base metal of the RBS cut surface if a sharp notch has been removed by grinding.

2f. Weld Tab Removal Sites

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 as required under Section J6.2b. The rate of MT is permitted to be reduced in accordance with Section J6.2h. MT of continuity plate weld tabs removal sites is not required.

2g. Reduction of Percentage of Ultrasonic Testing

The reduction of percentage of UT is permitted to be reduced in accordance with *AISC 360* Section N5.5e, except no reduction is permitted for demand critical welds.

2h. Reduction of Percentage of Magnetic Particle Testing

The amount of MT on CJP groove welds is permitted to be reduced if approved by the *EOR* and LBO Chief Welding Inspector. The MT rate for an individual welder or welding operator is permitted to be reduced to 10%, provided the reject rate is demonstrated to be 5% or less of the welds tested for the welder or welding operator. A sampling of at least 20 completed welds for a job shall be made for such reduction evaluation. Reject rate is the number of welds containing rejectable defects divided by the number of welds completed. This reduction is prohibited on welds in the *k*-area, at repair sites, backing removal sites, and access holes.

J7. INSPECTION OF HIGH-STRENGTH BOLTING

Bolting inspection shall satisfy the requirements of *AISC 360* Section N5.6 and this section. Bolting inspection shall be performed by both QC and QA personnel. As a minimum, the tasks shall be as listed in Tables J7-1, J7-2, and J7-3.

TABLE J7-1
Inspection Tasks Prior to Bolting

Inspection Tasks Prior to Bolting	QC		QA	
	Task	Doc.	Task	Doc.
Proper fasteners selected for the joint detail	O	–	O	–
Proper bolting procedure selected for joint detail	O	–	O	–

Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements	O	–	O	–
Pre-installation verification testing by installation personnel observed for fastener assemblies and methods used	P	D	O	D
Proper storage provided for bolts, nuts, washers and other fastener components	O	–	O	–

TABLE J7-2
Inspection Tasks During Bolting

Inspection Tasks During Bolting	QC		QA	
	Task	Doc.	Task	Doc.
Fastener assemblies placed in all holes and washers (if required) are positioned as required	O	–	O	–
Joint brought to the snug tight condition prior to the pretensioning operation	O	–	O	–
Fastener component not turned by the wrench prevented from rotating	O	–	O	–
Bolts are pretension progressing systematically from the most rigid point toward the free edges	O	–	O	–

TABLE J7-3
Inspection Tasks After Bolting

Inspection Tasks After Bolting	QC		QA	
	Task	Doc.	Task	Doc.
Document accepted and rejected connections	P	D	P	D

J8. OTHER STEEL STRUCTURE INSPECTIONS

Other inspections of the steel structure shall satisfy the requirements of *AISC 360* Section N5.7 and this section. Such inspections shall be performed by both QC and QA personnel. Where applicable, the inspection tasks listed in Table J8- 1 shall be performed.

TABLE J8-1
Other Inspection Tasks

Other Inspection Tasks	QC		QA	
	Task	Doc.	Task	Doc.
RBS requirements, if applicable – Contour and finish – Dimensional tolerances	P	D	P	D
Protected zone—no holes and unapproved attachments made by fabricator or erector, as applicable	P	D	P	D

User Note: The *protected zone* should be inspected by others following completion of the work of other trades, including those involving curtainwall, mechanical, electrical, plumbing and interior partitions.

J9. INSPECTION OF COMPOSITE STRUCTURES

Where applicable, inspections of the composite structures shall satisfy the requirements of *AISC 360* Section N6 and this section. These inspections shall be performed by the responsible Subcontractor's QC personnel and by QA personnel.

Where applicable, inspection of structural steel used in composite structures shall comply with the requirements of this Attachment. Where applicable, inspection of reinforced concrete shall comply with the requirements of ACI 318, and inspection of welded reinforcing steel shall comply with the applicable requirements of Section J6.1.

Where applicable to the type of composite construction, the minimum inspection tasks shall be as listed in Tables J9-1, J9-2, and J9-3.

TABLE J9-1
Inspection of Composite Structures
Prior to Concrete Placement

Inspection of Composite Structures Prior to Concrete Placement	QC		QA	
	Task	Doc.	Task	Doc.
Material identification of reinforcing steel (Type/Grade)	O	–	O	–
Determination of carbon equivalent for reinforcing steel other than ASTM A706	O	–	O	–
Proper reinforcing steel size, spacing and orientation	O	–	O	–
Reinforcing steel has not been rebent in the field	O	–	O	–
Reinforcing steel has been tied and supported as required	O	–	O	–
Required reinforcing steel clearances have been provided	O	–	O	–
Composite member has required size	O	–	O	–

TABLE J9-2
Inspection of Composite Structures
During Concrete Placement

Inspection of Composite Structures During Concrete Placement	QC		QA	
	Task	Doc.	Task	Doc.
Concrete: Material identification (mix design, compressive strength, maximum large aggregate size, maximum slump)	O	D	O	D
Limits on water added at the truck or pump	O	D	O	D
Proper placement techniques to limit segregation	O	–	O	–

TABLE J9-3
Inspection of Composite Structures
After Concrete Placement

Inspection of Composite Structures After Concrete Placement	QC		QA	
	Task	Doc.	Task	Doc.
Achievement of minimum specified concrete compressive strength at specified age	-	D	-	D

**********TEMPLATE RECORD OF REVISIONS**

Delete from edited document

Rev	Date	Description	POC	RM
0	10/27/06	Initial issue.	Tobin Oruch, *CENG-OFF*	Kirk Christensen, *CENG-OFF*
1	6/26/07	Reformatted	Tobin Oruch, *CENG-OFF*	Kirk Christensen, *CENG-OFF*
2	7/21/08	Minor changes.	Tobin Oruch, *CENG-OFF*	Kirk Christensen, *CENG-OFF*
3	9/15/09	Added App H (SSRwrtSI) reference.	Tobin Oruch, *CENG-OFF*	Gary Read, *CENG-OFF*
4	8/25/10	CM-CE must approve TIP.	Tobin Oruch, *CENG-OFF*	Larry Goen, *CENG-OFF*
5	3/8/12	Update for 2009 IBC and addition of AISC 341 QA plan template.	Tobin Oruch, *CENG-OFF*	Larry Goen, *CENG-OFF*
6	10/31/12	Improvements, SSI need not include other inspections, strengthened CM-CE approval.	Tobin Oruch, *CENG-OFF*	Larry Goen, *CENG-OFF*
7	9/24/13	Moved TIP info out to new Att I template for same. Became Att versus App.	Tobin Oruch, *ES-DO*	Larry Goen, *ES-DO*
8	5/22/14	Clarified SI role, template editing, roofing as special case.	Tobin Oruch, *ES-DO*	Mel Burnett, *ES-DO*
9	8/7/14	Clarified the NDE associated with the weld inspections may be performed by an approved subcontractor or third party.	Tobin Oruch, *ES-DO*	Mel Burnett, *ES-DO*
10	3/27/15	Major revision for IBC 2015 and standards referenced therein.	Tobin Oruch, *ES-DO*	Larry Goen, *ES-DO*
11	3/15/16	AAC masonry removed, and corrected a few ACI and App A references.	Tobin Oruch, *ES-DO*	Larry Goen, *ES-DO*
12	4/12/18	Defined nonstructural concrete, corrected IBC Table 1705.3 omission of shotcrete, included NMAC strengthening changes to Table 1705.3, other minor changes.	Tobin Oruch, *ES-FE*	Larry Goen, *ES-DO*
13	11/09/18	Defined nonstructural concrete, corrected IBC Table 1705.3 omission of shotcrete, included NMAC strengthening changes to Table 1705.3, other minor changes.	Tobin Oruch, *ES-FE*	Larry Goen, *ES-DO*

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