STATEMENT OF SPECIAL INSPECTIONS: STEEL APPENDIX CNI-033A

This appendix supplements the Statement of Special Inspections Form when steel inspections are required per:

CBC 1705.2.1	Steel Construction in accordance with AISC 360
CBC 1705.11.1	Structural Steel for Verification and Inspection for Seismic Resistance in accordance with AISC 341
CBC 1705.11.1	Structural Steel for Testing and Qualification for Seismic Resistance in accordance with AISC 341

The following tables are reproduced from **AISC 360 Chapter N** and **AISC 341 Chapter J** for Quality Control (QC) and Quality Assurance (QA). Generally, QC governs inspections for shop fabrication and the related field assembly and QA governs primarily site built assemblies. Reference those chapters for additional information. The following inspections are required if applicable to details in the construction documents.

Table Entries:

NR	Not required.
O	Observe these items on a random basis. Operations need not be delayed pending these inspections.
P	Perform these tasks for each welded joint or member. (AISC 360) These inspections shall be performed prior to the final acceptance of the item. (AISC 341)
D	Document: The inspector shall prepare reports indicating that the work has been performed in accordance with the contract documents. See reference for specifics.

TABLE N5.4-1 Inspection Tasks Prior to Welding	QC	QA	✓ if Required
Welding procedure specifications (WPSs) available	P	P	☐
Manufacturer certifications for welding consumables available	P	P	☐
Material identification (type/grade)	O	O	☐
Welder identification system[a]	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)	O	O	☐
Fit-up of CJP groove welds of HSS T-, Y- and J-joints without backing (including joint geometry) • Joint Preparations • Dimensions (alignment, root opening, root face, bevel) • Cleanliness (condition of steel surfaces) • Tacking (tack weld quality and location)	P	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)	O	O	☐
Check welding equipment	O	NR	☐

[a] 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.

TABLE N5.4-2 Inspection Tasks During Welding	QC	QA	✓ if Required
Control and handling of welding consumables • Packaging • Exposure control	O	O	☐
No welding over cracked tack welds	O	O	☐
Environmental conditions • Wind speed within limits • Precipitation and temperature	O	O	☐
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)	O	O	☐
Welding techniques • Interpass and final cleaning • Each pass within profile limitations • Each pass meets quality requirements	O	O	☐
Placement and installation of steel headed stud anchors	P	P	☐

TABLE N5.4-3 Inspection Tasks After Welding	QC	QA	✓ if Required
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 • Weld size • Undercut • Porosity	P	P	☐
Arc strikes	P	P	☐
k-area[a]	P	P	☐
Weld access holes in rolled heavy shapes and built-up heavy shapes[b]	P	P	☐
Backing removed and weld tabs removed (if required)	P	P	☐
Repair activities	P	P	☐
Document acceptance or rejection of welded joint or member	P	P	☐
No prohibited welds have been added without the approval of the EOR	O	O	☐

[a] 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. (75 mm) of the weld.

[b] After rolled heavy shapes (see Section A3.1c of AISC 360) and built-up heavy shapes (see Section A3.1d of AISC 360) are welded, visually inspect the weld access hold for cracks.

TABLE N5.6-1 Inspection Tasks Prior to Bolting	QC	QA	✓ if Required
Manufacturer's certifications available for fastener materials	O	P	☐
Fasteners marked in accordance with ASTM requirements	O	O	☐
Correct fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane)	O	O	☐
Correct 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 and documented for fastener assemblies and methods used	P	O	☐
Proper storage provided for bolts, nuts, washers and other fastener components	O	O	☐

TABLE N5.6-2 Inspection Tasks During Bolting	QC	QA	✓ if Required
Fastener assemblies, of suitable condition, 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	☐
Fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point toward the free edges	O	O	☐

TABLE N5.6-3 Inspection Tasks After Bolting	QC	QA	✓ if Required
Document acceptance or rejection of bolted connections	P	P	☐

TABLE J6.1 Visual Inspection Tasks Prior to Welding	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Material identification (type/grade)	O	NR	O	NR	☐
Welder identification system	O	NR	O	NR	☐
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**	NR	O	NR	☐
Configuration and finish of access holes	O	NR	O	NR	☐
Fit-up of fillet welds • Dimensions (alignment, gaps at root) • Cleanliness (condition of steel surfaces) • Tacking (tack weld quality and location)	P/O**	NR	O	NR	☐

** 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	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
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	NR	O	NR	☐
Use of qualified welders	O	NR	O	NR	☐
Control and handling of welding consumables • Packaging • Exposure control	O	NR	O	NR	☐
Environmental conditions • Wind speed within limits • Precipitation and temperature	O	NR	O	NR	☐
Welding techniques • Interpass and final cleaning • Each pass within profile limitations • Each pass meets quality requirements	O	NR	O	NR	☐
No welding over cracked tacks	O	NR	O	NR	☐

TABLE J6.3 Visual Inspection Tasks After Welding	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Welds cleaned	O	NR	O	NR	☐
Size, length, and location of welds	P	NR	P	NR	☐
Welds meet visual acceptance criteria • Crack prohibition • Weld/base-metal fusion • Crater cross section • Weld profiles and size • Weld size • Undercut • Porosity	P	D	P	D	☐
k-area[1]	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	NR	P	D	☐

[1] 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. (75 mm) of the weld. The visual inspection shall be performed no sooner than 48 hours following completion of the welding.

TABLE J7.1 Inspection Tasks Prior to Bolting	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Proper fasteners selected for the joint detail	O	NR	O	NR	☐
Proper bolting procedure selected for joint detail	O	NR	O	NR	☐
Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements	O	NR	O	NR	☐
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	NR	O	NR	☐

TABLE J7.2 Inspection Tasks During Bolting	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Fastener assemblies placed in all holes and washers (if required) are positioned as required	O	NR	O	NR	☐
Joint brought to the snug tight condition prior to the pretensioning operation	O	NR	O	NR	☐
Fastener component not turned by the wrench prevented from rotating	O	NR	O	NR	☐
Bolts are pretensioned progressing systematically from the most rigid point toward the free edges	O	NR	O	NR	☐

TABLE J7.3 Inspection Tasks After Bolting	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Document accepted and rejected connections	P	D	P	D	☐

TABLE J8.1 Other Inspection Tasks	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
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	☐

TABLE J9.1 Inspection of Composite Structures Prior to Concrete Placement	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Material identification of reinforcing steel (Type/Grade)	O	NR	O	NR	☐
Determination of carbon equivalent for reinforcing steel other than ASTM A706	O	NR	O	NR	☐
Proper reinforcing steel size, spacing and orientation	O	NR	O	NR	☐
Reinforcing steel has not been rebent in the field	O	NR	O	NR	☐
Reinforcing steel has been tied and supported as required	O	NR	O	NR	☐
Required reinforcing steel clearances have been provided	O	NR	O	NR	☐
Composite member has required size	O	NR	O	NR	☐

TABLE J9.2 Inspection of Composite Structures During Concrete Placement	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
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	NR	O	NR	☐

TABLE J9.3 Inspection of Composite Structures After Concrete Placement	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Achievement of minimum specified concrete compressive strength at specified age	NR	D	NR	D	☐

TABLE J10.1 Inspection of H-Piles	QC Task	QC Doc.	QA Task	QA Doc.	✓ if Required
Protected zone—no holes and unapproved attachments made by the responsible contractor, as applicable	P	D	P	D	☐