Statement of Special Inspection Requirements

California Building Code Chapter 17

Construction plans shall include a statement of special inspection in accordance with CBC chapter 17. The statement of special inspection shall include the following:

1- *The materials, systems, components and work required to have special inspections or tests by the Building Code or by the registered design professional responsible for each portion of work.*

2- *The type and extent of each special inspection or test.*

3- *Additional requirements for special inspections or tests for seismic or wind resistance as specified in Sections 1705.11, 1705.12 and 1705.13*

4- *For each type of special inspection, identification whether it will be continuous or periodic, or performed in accordance with the reference standard where the inspections are defined.*

TABLE 1705.2.3

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

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

For SI: 1 inch = 25.4 mm.

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

Masonry Construction **(TMS602-16 Table 3 & 4)**

TMS 602-16 – Table 3, Minimum Verification Requirements				
Minimum Verification	**Required for Quality Assurance**			**Reference for Criteria**
	Level 1	**Level 2**	**Level 3**	**TMS 602**
Prior to construction, verification of compliance of submittals.	R	R	R	Art 1.5
Prior to construction, verification of f'_m, and f'_{AAC}, except where specifically exempted by the Code.	NR	R	R	Art 1.4 B
During construction, verification of Slump flow and Visual Stability Index (VSI) when self-consolidating grout is delivered to the project site.	NR	R	R	Art 1.5 & 1.6.3
During construction, verification of f'_m, and f'_{AAC} for every 5,000 sq. ft.	NR	NR	R	Art 1.4 B
During construction, verification of proportions of materials as delivered to the project site for premixed or preblended mortar, prestressing grout, and grout other than self- onsolidating grout.	NR	NR	R	Art 1.4 B

Minimum inspection tasks, listed in TMS 602 *Specification for Masonry Structures*, are required for masonry construction. The level of inspection is determined by the code, depending on the type of design and seismic exposure and must be considered by the designer when developing a Quality Assurance program for the project. Most designed buildings will be assigned Inspection Level 2 whereas Essential Service facilities will require Level 3 inspection. Not all tasks will apply to a given project.

MINIMUM SPECIAL INSPECTION (TMS 602-16, Table 4)					
Inspection Task	**Frequency[a]**			**Reference for Criteria**	
	Level 1	**Level 2**	**Level 3**	**TMS 402**	**TMS 602**
1. As masonry construction begins, verify that the following are in compliance:					
a. Proportions of site-prepared mortar	NR	P	P		Art 2.1, 2.6 A & 2.6 C
b. Grade and size of prestressing tendons and anchorages	NR	P	P		Art 2.4 B & 2.4 H
c. Grade, type and size of reinforcement, connectors, anchor bolts, and prestressing tendons and anchorages	NR	P	P		Art 3.4 & 3.6 A
d. Prestressing technique	NR	P	P		Art 3.6 B
e. Properties of thin-bed mortar for AAC masonry	NR	C[b]/P[c]	C		Art 2.1 C.1
f. Sample panel construction	NR	P	C		Art 1.6 D
2. Prior to grouting, verify that the following are in compliance:					
a. Grout space	NR	P	C		Art 3.2 D & 3.2 F
b. Placement of prestressing tendons and anchorages	NR	P	P	Sec 10.8 & 10.9	Art 2.4 & 3.6
c. Placement of reinforcement, connectors, and anchor bolts	NR	P	C	Sec 6.1, 6.3.1, 6.3.6 & 6.3.7	Art 3.2 E & 3.4
d. Proportions of site-prepared grout and prestressing grout for bonded tendons	NR	P	P		Art 2.6 B & 2.4 G.1.b
3. Verify compliance of the following during construction:					
a. Materials and procedures with the approved submittals	NR	P	P		Art 1.5
b. Placement of masonry units and mortar joint construction	NR	P	P		Art 3.3 B
c. Size and location of structural members	NR	P	P		Art 3.3 F
d. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction	NR	P	C	Sec 1.2.1(e), 6.2.1 & 6.3.1	
e. Welding of reinforcement	NR	C	C	Sec .6.1.6.1.2	
f. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F)	NR	P	P		Art 1.8 C & 1.8 D
g. Application and measurement of prestressing force	NR	C	C		Art 3.6 B
h. Placement of grout and prestressing grout for bonded tendons is in compliance	NR	C	C		Art 3.5 & 3.6 C
i. Placement of AAC masonry units and construction of thin-bed mortar joints	NR	C[b]/P[c]	C		Art 3.3 B.9 & 3.3 F.1.b
4. Observe preparation of grout specimens, mortar specimens, and/or prisms	NR	P	C		Art 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3 & 1.4 B.4

(a) Frequency refers to the frequency of inspection, which may be continuous or periodically during the listed task, as defined in the table. NR-Not Required, P=Periodic, C=Continuous
(b) Required for the first 5000 square feet of AAC masonry.
(c) Required after the first 5000 square feet of AAC masonry

Note: *The table lists minimum inspection requirements. Project documents may increase requirements from Periodic to Continuous or list inspection tasks in addition to those listed in the table.*

The table above provides guidance to the designer in developing a Quality Assurance (QA) program. When a contractor knows what the QA program is, then developing a Quality Control program to satisfy the QA requirements is much simpler.

Masonry contractors are required to implement a successful Quality Control program based on the QA tasks listed in the table. Doing so will result in fewer corrections to the installed masonry work and provide a superior-quality product.

TABLE 1705.3

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFRENCED STANDARD	IBC REFERENCE
1. Inspect reinforcement, including prestressing tendons, and verify placement.	—	X	ACI 318 Ch. 20, 25.2, 25.3, 26.5.1-26.5.3	1908.4
2. Reinforcing bar welding: a. Verify weldability of reinforcing bars other than ASTM A706; b. Inspect single-pass fillet welds, maximum $^{5}/_{16}''$; and c. Inspect all other welds.	— X	X X	AWS D1.4 ACI 318: 26.5.4	—
3. Inspect anchors cast in concrete.	—	X	ACI 318: 17.8.2	—
4. Inspect anchors post-installed in hardened concrete members.[b] a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads. b. Mechanical anchors and adhesive anchors not defined in 4.a.	X	 X	ACI 318: 17.8.2.4 ACI 318: 17.8.2	—
5. Verify use of required design mix.	—	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
6. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C172 ASTM C31 ACI 318: 26.4.5, 26.12	1908.10
7. Inspect concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 26.4.5	1908.6, 1908.7, 1908.8
8. Verify maintenance of specified curing temperature and techniques.	—	X	ACI 318: 26.4.7-26.4.9	1908.9
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	—
10. Inspect erection of precast concrete members.	—	X	ACI 318: Ch. 26.8	—
11. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 26.10.2	—
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 26.10.1(b)	—

For SI: 1 inch = 25.4 mm.

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

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

TABLE 1705.6

REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

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

TABLE 1705.7

REQUIRED SPECIAL INSPECTIONS AND TESTS OF DRIVEN DEEP FOUNDATION ELEMENTS

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

TABLE 1705.8

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

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

REQUIRED SPECIAL INSPECTIONS AND TESTS OF STEEL CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]
1. Material identification and testing of high-strength bolts, nuts and washers:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	RCSC: 1.5, AISC 360: A3.3, J3.1 and applicable ASTM material standards
b. Manufacturer's certificate of compliance required.	—	X	RCSC: 1.5 & 2.1; AISC 360: A3.3 & N3.2
c. Testing of high-strength bolts, nuts and washers.	—	—	RCSC: 7.2, Applicable ASTM material standards
2. Inspection of high-strength bolting:			
a. Snug-tight joints.	—	X	RCSC: 7-9, AISC 360: J3.1, J3.2, M2.5 & N5.6
b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation	—	X	
c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.	X	—	
3. Material identification and testing of structural steel and cold-formed steel deck:			
a. For structural steel, identification markings to conform to AISC 360.	—	X	AISC 360: A3.1
b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards
c. Manufacturer's certified test reports.	—	X	AISC 360: A3.1& N3.2
d. Testing of unidentified steel.	—	—	Applicable ASTM material standards
4. Material identification of welding consumables and testing of welded elements:			
a. Identification markings to conform to AWS specification in the approved construction documents.	—	X	AISC 360, A3.5 & N3.2 and applicable AWS A5 documents
b. Manufacturer's certificate of compliance required.	—	X	AISC 360: N3.2
c. Nondestructive testing of welded joints.	—	—	AISC 360: N5.5
5. Inspection of welding:			
a. Structural steel and cold-formed steel deck:			
1. Complete and partial joint penetration groove welds	X	—	AISC 360: J2, M2.4, & M4.5, AWS D1.1 AWS D1.8
2. Multipass fillet welds.	X	—	
3. Single-pass fillet welds > $^5/_{16}$"	X	—	
4.Plug and slot welds.	X	—	
5. Single-pass fillet welds ≤ $^5/_{16}$"	—	X	
6. Floor and roof deck welds.	—	X	AWS D1.3, SDI QA/QC
7. End-welded studs.	—	X	AWS D1.1
8. Welded sheet steel for cold-formed framing members	—	X	AWS D1.3
b. Reinforcing steel:			
1. Verification of weldability of reinforcing steel other than ASTM A706.	—	X	AWS D1.4, ACI 318: 18.2.8, 25.5.7.4, 26.6.4.1
2. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—	
3. Shear reinforcement.	X		
4. Other reinforcing steel.	—	X	
5. Tests of reinforcing bars.	—	—	—
6. Inspection of steel frame joint details for compliance:			
a. Details such as bracing and stiffening.	—	X	AISC 360: N5.8
b. Member locations.	—	X	
c. Application of joint details at each connection.	—	X	

For SI: 1 inch = 25.4 mm.