

STRUCTURAL ENGINEERING SUMMIT



SPECIAL INSPECTIONS/QUALITY ASSURANCE COMMITTEE

2021 IBC CHAPTER 17 CASE STUDY AND REFERENCE AIDS

- 01** CASE STUDY PROBLEM STATEMENT & SOLUTION
- 02** CASE STUDY DRAWINGS
- 03** CHAPTER 17 SCOPE AID
- 04** ROLES AND RESPONSIBILITIES AID

Problem Statement:

Identify the Special Inspections, Tests, Structural Observations, and Certificates of Compliance required for the project below by IBC 2021 and Referenced Standards.

Although the information below may at first appear to be superfluous information, everything below is necessary to determine which Special Inspections, Structural Tests, Structural Observations, and Certificates of Compliance are required. In other cases, additional information might be required.

Givens:

Referenced Code: IBC 2021

Project Type: New 1–Story Laboratory

Geographic Location: US Atlantic Coast

CONSTRUCTION:

- New building.
- Finish grade matches slab on ground elevation throughout
- All construction assembled onsite except for manufactured wood roof I-joists (by a manufacturer in accordance with a standard referenced by IBC) and prefabricated open-web steel roof joists (by an approved fabricator in accordance with SJI 100 for LH joists)
- An expansion joint is provided between the wood and masonry framed wings of the building, separating it into a “Wood Structure” and a “Masonry Structure”
- No hazardous materials are present in the building
- No vibration isolation systems are provided
- Welding of rebar is not permitted.
- Glass unit masonry light transoms are provided
- Sprayed applied fireproofing is applied to steel joists
- Fire-resistant joints and penetration firestops are provided

STRUCTURAL MATERIALS AND ELEMENTS:

Foundation system:

- Shallow continuous wall spread footings
- Concrete Compressive Strength used in design, $f'c = 4,500$ PSI
- Foundation walls are not constructed in accordance with Table 1807.1.6.2.
- Slab on ground is non-structural.

Gravity Force Resisting System:

Masonry wing of structure:

- 20 gauge cold-formed steel roof deck
- Open-web steel roof joists (by an approved fabricator)
- CMU bearing walls

Wood-framed wing of structure (HVAC Room):

- Wood structural panel roof sheathing
- Manufactured wood roof I-joists
- Nominal 2x wood stud bearing walls

STRUCTURAL MATERIALS AND ELEMENTS:

Lateral Force-Resisting System(s):

Masonry wing of structure:

Mean Roof Height and (seismic) Structural Height = 30'-0"

Roof Diaphragm:

- 20 gauge cold-formed steel roof deck
- Reinforced masonry bond beam chords
- No collectors required

Vertical Elements of the LFRS: Bearing Wall System:

- Ordinary masonry shear walls (designed in accordance with Part 3 (Engineered Design Methods) of TMS 402) with (Flexible) Cold-Formed Steel Deck Diaphragm

Wood-framed wing of structure (HVAC Room):

Mean Roof Height and (seismic) Structural Height = 12'-0"

Roof Diaphragm:

- Wood structural panel sheathing with specified nail spacing of 6" oc
- Continuous wood wall top plate chords

Vertical Elements of the LFRS: Bearing Wall System:

- Eastern Shear wall: Light-frame (wood) shear wall sheathed with "High-Load Diaphragm"
- Other Shear walls: Light-frame (wood) shear wall sheathed with wood structural panels rated for shear resistance (Single row of fasteners spaced 6" oc)

STRUCTURAL DESIGN CRITERIA:

Risk Category: IV (Essential Facility)

Seismic Design Category: C

S_{DS} : 0.311

Basic Design Wind Speed: V=140 M.P.H. (Windborne Debris Region), Exposure "C"

No. of Stories: 1

Nonstructural Components:

Project-specific design and documentation indicating compliance with requirements for seismic load and displacement demands for nonstructural components (including their supports and attachments) shall be submitted for approval to the building official after review and acceptance by a registered design professional.

Automatic sprinkler systems are to be installed with minimum clearances as required by Section 13.2.3 of ASCE 7. Flexible sprinkler hose fittings are not used, except across the expansion joint.

All other utilities also have flexible couplings across the expansion joint between the two structures of the building.

Designated Seismic Systems:

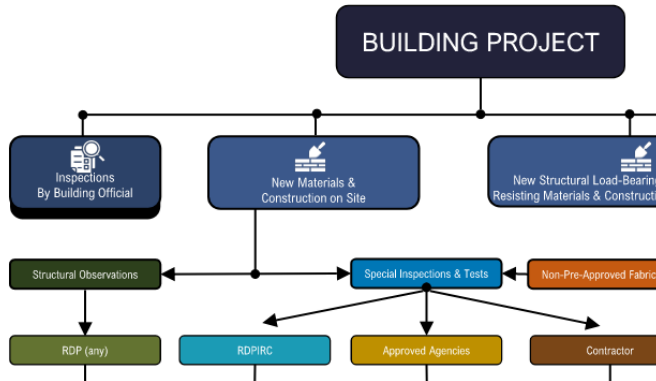
Emergency generator – to be seismically qualified by testing per ASCE 7 Sect 13.2.5.

Disclaimer:

This case study illustrates a general understanding of the process and outcome of determining applicable special inspections and tests, etc., and may not be a comprehensive list of every requirement for a specific project. Although not indicated, the frequencies of special inspections and tests are as indicated in the applicable Code and Referenced Standards and/or as required by the SEOR.

General SIQA Requirements and Responsibilities in IBC Chapter 17*:

A. Referring to the attached Roles and Responsibilities Chart, the broad requirements are as follows.



1. "New" Materials Subjected to Special Inspections and Testing (Existing Construction Typically Exempt). (Section 1702.1 of IBC)
2. Statement of Special Inspections (SSI) issued by the *Registered Design Professional In Responsible Charge (RDPIRC)*. (Section 1704.2.3 and 1704.3 of IBC)
3. Approved Agencies to provide written documentation to *Building Official (BO)* demonstrating competence and relevant experience or training of the special inspectors. (Section 1704.2.1 of IBC)
4. Approved Agencies keep records of special inspections and tests, submitting reports (including final report) to the *BO* and *RDPIRC*. (Section 1704.2.4 of IBC)
5. Contractor must acknowledge that Special Inspections and Tests need to be performed on select items. (Section 1704.4 of IBC)

How to identify potentially applicable required Special Inspections, Tests and Certificates of Compliance:

- A. In the attached Chapter 17 Scope Aid:
1. Locate rows with materials or elements applicable to the Project below the dark blue heading.
 2. Identify applicable triggers in the light blue columns.
 3. Identify the corresponding IBC section in the intersecting box to determine the required scope, or whether the item is exempted from special inspections and tests.

Chapter 17 Scope Aid: Code-Required Special Insp

Material or Element			IBC 2021 section that specifies base requirements for ALL structures, (if applicable)	SDC	
				SDC B	SDC C
Steel Construction	Structural Steel	Welds, fasteners and elements identified in COSP	1705.2.1 --> AISC 360 Chap N		
		Structural steel in the lateral-force resisting system		1705.13.1.2 --> AISC 341	1705.13.1.2 --> AI
		Other steel elements of the LFRS Inc. struts, collectors, chords, and foundation elements		1705.13.1.1 --> AISC 341	1705.13.1.1 --> AI
	Cold-formed steel deck	1705.2.2 --> SDI QA/QC			
	Open-web steel joists and joist girders	Table 1705.2.3			
		Bracing for trusses spanning 60 ft or more	1705.2.4		
		Welding and fastening elements of the LFRS			1705.13.3
		Roof framing connections			

Special Inspections Required by IBC and Referenced Standards:

- A. **Cold-Formed Steel Deck:** Attachments, deck placement, and verification of materials (Section 1705.2.2 of IBC and SDI QA/QC Document)
- B. **Open-Web Steel Joists:** End connections & bridging installation and verification of materials (Table 1705.2.3 of IBC)
- Note:
1. Since joists themselves are produced by an approved fabricator following SJI 100, no special inspections of joist production need to take place; however, per Section 2207.5 of IBC, a Certificate of Compliance is required, which should be reviewed by the approved agency – see below.
- C. **Concrete Construction:** (Section 1705.3 of IBC)
1. Wall footings supporting masonry construction require special inspections in accordance with Table 1705.3 of IBC.
 2. All foundation walls require special inspections in accordance with Table 1705.3 of IBC.
- Note:
1. Nonstructural concrete slabs on ground and continuous wall footings that support only wood light-frame construction are exempt from special inspections (Section 1705.3 Exception 2.1. of IBC)
- D. **Masonry construction:** Level 3 Inspections from TMS 602 Table 4, which are extensive (Section 1705.4 of IBC and Table 3.1 of TMS 402)
1. Glass Unit Masonry: Level 2 Inspections from TMS 602 (Section 1705.4.1 of IBC)
- E. **Wood Construction:** The eastern shear wall is identified as a high-load diaphragm and, therefore, the following special inspections are required (Section 1705.5.1 of IBC)
1. Verify wood structural panel grade and thickness at the high-load diaphragm
 2. Verify nominal size of framing members (depth [Section 4.2.8.1.2 Item 4 of SDPWS] and width [Section 4.2.8.1.2 Item 5 of SDPWS, and Table 4.2B of SDPWS]) installed at boundary edges and adjoining panel edges
 3. Verify nail diameter and length
 4. Verify number of fastener lines, the spacing between fasteners in each line, and the edge margins at adjoining panel edges comply with the conditions noted per nominal width of nailed face as indicated in Figure 4C of SDPWS
- Note:
1. Special inspections of manufactured wood elements are not required because manufactured wood I-joists that are produced in accordance with standards referenced by IBC, or in accordance with a referenced standard that provides requirements for quality control done under the supervision of a third-party quality control agency, are not “fabricated items” according to the definition in IBC Section 202. Therefore, manufactured wood I-joists do not require special inspection or a certificate of compliance at the completion of production.
- F. **Soils:** Existing Site Soils conditions, excavation depths, fill placement, and load-bearing requirements are in accordance with approved construction documents and the approved geotechnical report (Section 1705.6 and Table 1705.6 of IBC)

Special Inspections Required by IBC and Referenced Standards: cont.

G. Special Inspections for Wind Resistance:

1. Inspect fastening of finish roof covering for entire structure (Section 1705.12.3 Item 1 of IBC)
2. Inspect fastening of roof framing connections for entire structure (Section 1705.12.3 Item 1 of IBC)
3. Inspect fastening of exterior finish wall covering for entire structure (Section 1705.12.3 Item 2 of IBC)
4. Inspect fastening between exterior wall and roof and floor diaphragms (Section 1705.12.3 Item 2 of IBC)

Note:

1. Special inspections for elements of the main windforce-resisting system (other than the high-load diaphragm listed under wood construction above) are not required because the shear wall panel edge fastener spacing exceeds 4" oc. (see exception in Section 1705.12.1 of IBC)

H. Special Inspections for Seismic Resistance:

1. Designated seismic systems: Emergency generator. Verify that the label, anchorage, and mounting conform to the certificate of compliance (Section 1705.13.4 of IBC)
2. Architectural Components are not required because the Seismic Design Category is C (Section 1705.13.5 of IBC)
3. Plumbing, Mechanical, and Electrical Components:
 - a) Electrical equipment for emergency and standby power systems. Verify anchorages (Section 1705.13.6 Item 1 of IBC)
 - b) Mechanical and electrical equipment, including duct work, piping systems and their structural supports, where automatic sprinkler systems are installed to verify one of the following: (Section 1705.13.6 Item 6 of IBC)
 - i. Minimum clearances have been provided as required by Section 13.2.3 of ASCE 7, or
 - ii. A nominal clearance of not less than 3 inches has been provided between automatic sprinkler system drops and sprigs and structural members not used collectively or independently to support the sprinklers; equipment attached to the building structure; and other systems' piping.

Notes:

1. Additional seismic-related special inspections are required because the building height of the overall structure exceeds 25 ft (see exception #2 in Section 1705.13 of IBC).
2. Special inspections for fastening of wood elements of the seismic-force resisting system are not required because the wood wing structure, being seismically separated from the masonry wing, meets criteria in exception item 1 in Section 1705.13 of IBC (other than the high-load diaphragm listed under wood construction above) because the specified panel edge fastener spacing exceeds 4" oc (see exception in Section 1705.13.2 of IBC).

Special Inspections Required by IBC and Referenced Standards: cont.

- I. **Sprayed fire-resistant materials:** (Section 1705.15 of IBC)
 - 1. Inspect steel joist surface conditions (Section 1705.15.2 of IBC)
 - 2. Application (Section 1705.15.3 of IBC)
 - 3. Thickness (Sections 1705.15.4 of IBC)
 - a) Minimum allowable thickness (Section 1705.15.4.1 of IBC)
 - b) Joists and trusses (Section 1705.15.4.7 of IBC)
 - 4. Verify compliance with all application aspects of sprayed fire-resistant material, including additional visual inspection after the rough installation of electrical, automatic sprinkler, mechanical, and plumbing systems and suspension systems for ceilings before concealment where applicable.
- J. **Fire-resistant penetrations and joints:** (Section 1705.18 of IBC).
 - 1. Inspect penetration firestop systems in accordance with ASTM E2174 (Section 1705.18.1 of IBC)
 - 2. Inspect fire-resistant joint systems in accordance with ASTM E2393 (Section 1705.18.2 of IBC)

Structural Testing Required by IBC (Chapter 17*):

- A. **Cold-Formed Steel Deck:** (Section 1705.2.2 of IBC)
 - 1. No tests required. (However, steel deck special inspector reviews material test reports and certifications per SDI QA/QC Sec. 4.2 B and 6.1 A.
- B. **Open-Web Steel Joists:** (Section 1705.2.3 of IBC)
 - 1. No tests required.
- C. **Concrete Construction:** (Section 1705.3 of IBC)
 - 1. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.
 - a) Exceptions:
 - i. Isolated footings are exempt since meets exception 1
 - ii. Meets exception 2.1 (for wood wing) but not 2.2 or 2.3, therefore code prescribed testing and special inspection is required for continuous footings
 - iii. Meets exception 3 for exempting non-structural slab-on-ground
 - iv. Does not meet exception 4 for foundation walls
 - v. Meets exception 5 for patios, driveways, and sidewalks
 - 2. Additional testing when lacking sufficient data or documentation providing evidence of conformance to quality standards for materials in ACI 318 Chapters 19 and 20 (Section 1705.3.2 of IBC also see Section 1903.1 of IBC).
- D. **Masonry Construction:** (Section 1705.4 of IBC)
 - 1. Exceptions do not apply.
 - 2. TMS 602 Table 3 and 4
 - 3. Glass unit masonry (TMS 602 Level 2 per Section 1705.4.1 of IBC)
- E. **Wood Construction:** (Section 1705.5 of IBC)
 - 1. No tests required.
- F. **Soils:** (Section 1705.6 of IBC)
 - 1. Soil materials shall be classified in accordance with ASTM D2487
 - a) Exception:
 - i. Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D1557.
- G. **Designated seismic systems:**
 - 1. Emergency generator – seismically qualified by testing (Section 1705.14.3 of IBC)
- H. **Sprayed fire-resistant materials:**
 - 1. Test density in accordance with ASTM E605 (Section 1705.15.1 and 1705.15.5 of IBC) and bond strength in accordance with ASTM E736 (Sections 1705.15.1, 1705.15.6, and 1705.15.6.2 of IBC).
- I. **Impact protective systems:** For being in a windborne debris regions (Section 1709.5.3.1 of IBC)

Structural Observations Required by IBC (Chapter 17*):

Because the building is classified as Risk Category IV, Structural Observations in accordance with Section 1704.6 are required. Visually observe representative locations of structural systems, details and load paths for general conformance to the approved construction documents and submit structural observation statements to the BO.

Certificates of Compliance Required by IBC (Chapter 17*) :

- A. For designated seismic systems in Seismic Design Category C (Section 1705.14.3 of IBC and ASCE 7 Section 13.2.2 Item 1)
 - 1. From emergency generator manufacturer indicating that equipment will remain operable after being subjected to design ground motions.
- B. For open-web steel joists on any project (Sections 1704.5 and 2207.5 of IBC)
 - 1. From joist manufacturer indicating work was performed in accordance with the approved construction documents and with SJI specifications listed in IBC Section 2207.1.

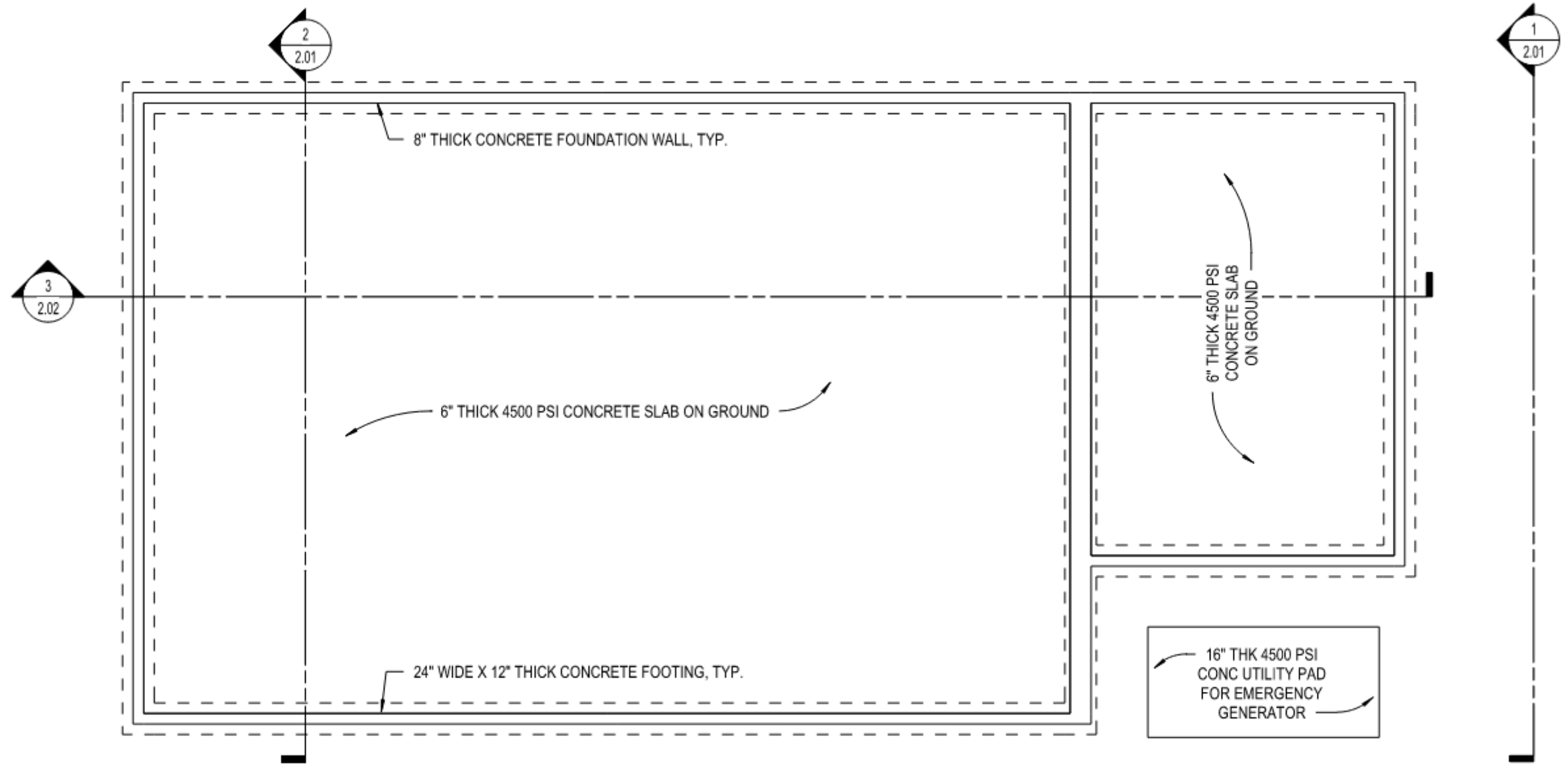
Notes:

- 1. *The wood I-joists are “manufactured” with virtually no variation from manufacturer to manufacturer if in accordance with standards referenced by IBC, and are therefore not “fabricated”, and for that reason do not require a Certificate of Compliance. The open-web steel joists, however, are produced with wide variation as permitted by SJI 100 (or SJI 200, as applicable), and therefore require a Certificate of Compliance (Section 2207.5 of IBC).*
- 2. *Because no fabrication of other structural members or assemblies is being performed offsite for this project example, there are no other approved fabricators to collect certificates of compliance from.*
- 3. *Because non-structural components are specified to have project-specific designs submitted for review and approval to the registered design professional and the building official, seismic qualification is not obtained per item 2 of ASCE 7 Sect 13.2.1 – thus a manufacturer’s certificate of compliance is not required.*

Contractor’s Responsibilities Required by IBC (Chapter 17*) :

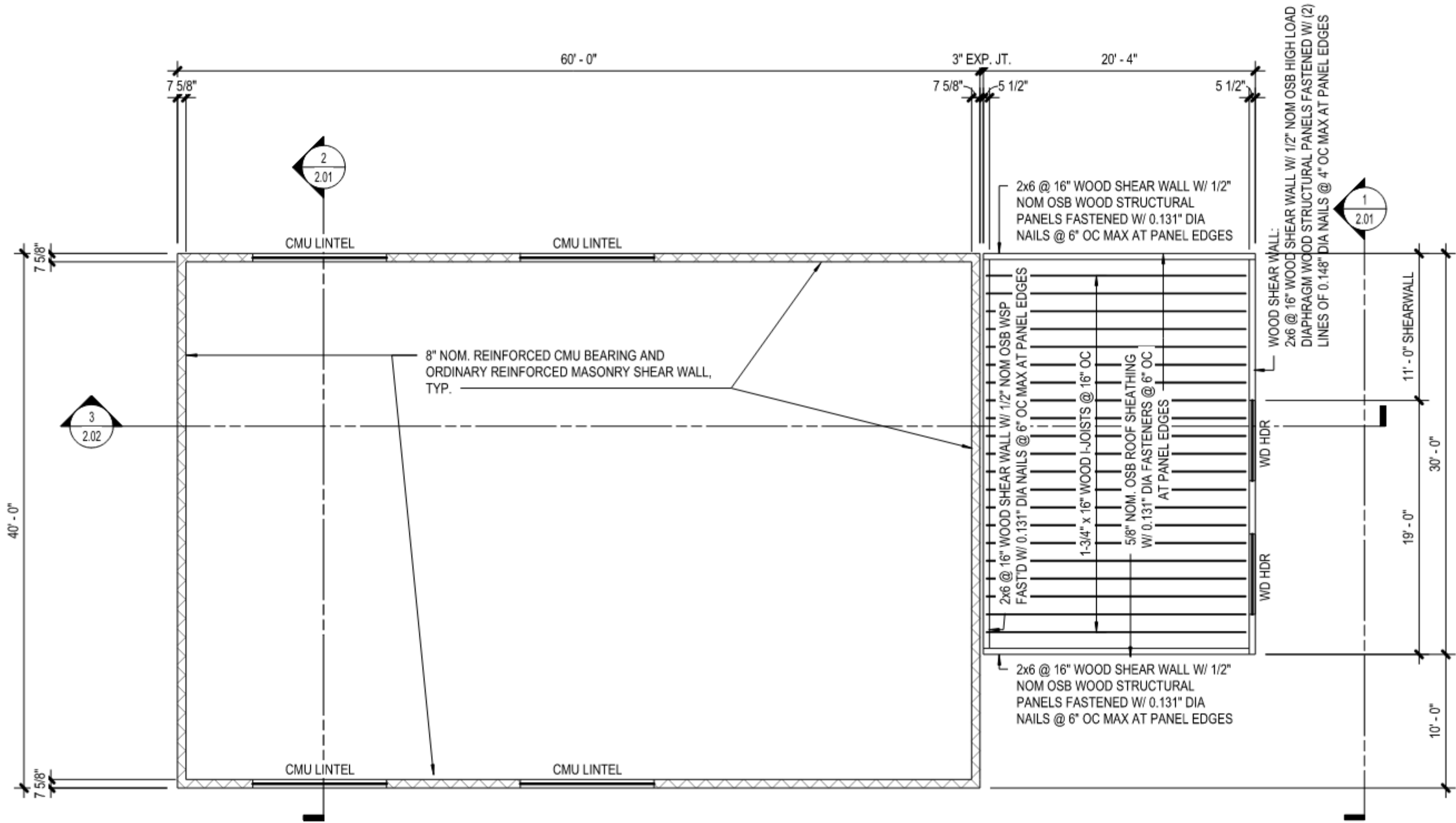
- A. *RDPIRC to specify that a Statement of Responsibility shall be signed by each contractor indicating contractor's acknowledgement of the special inspection and quality assurance requirements for the items identified in previous pages that are part of the main wind- or seismic-force-resisting systems and the designated seismic systems (e.g, masonry shear walls and the eastern wood shear wall with high-load diaphragm, etc.*

**Special Inspections and Structural Testing are in addition to building inspections included in Chapter 1 conventionally conducted by the Building Official.*

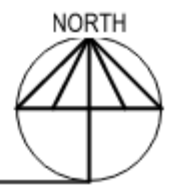


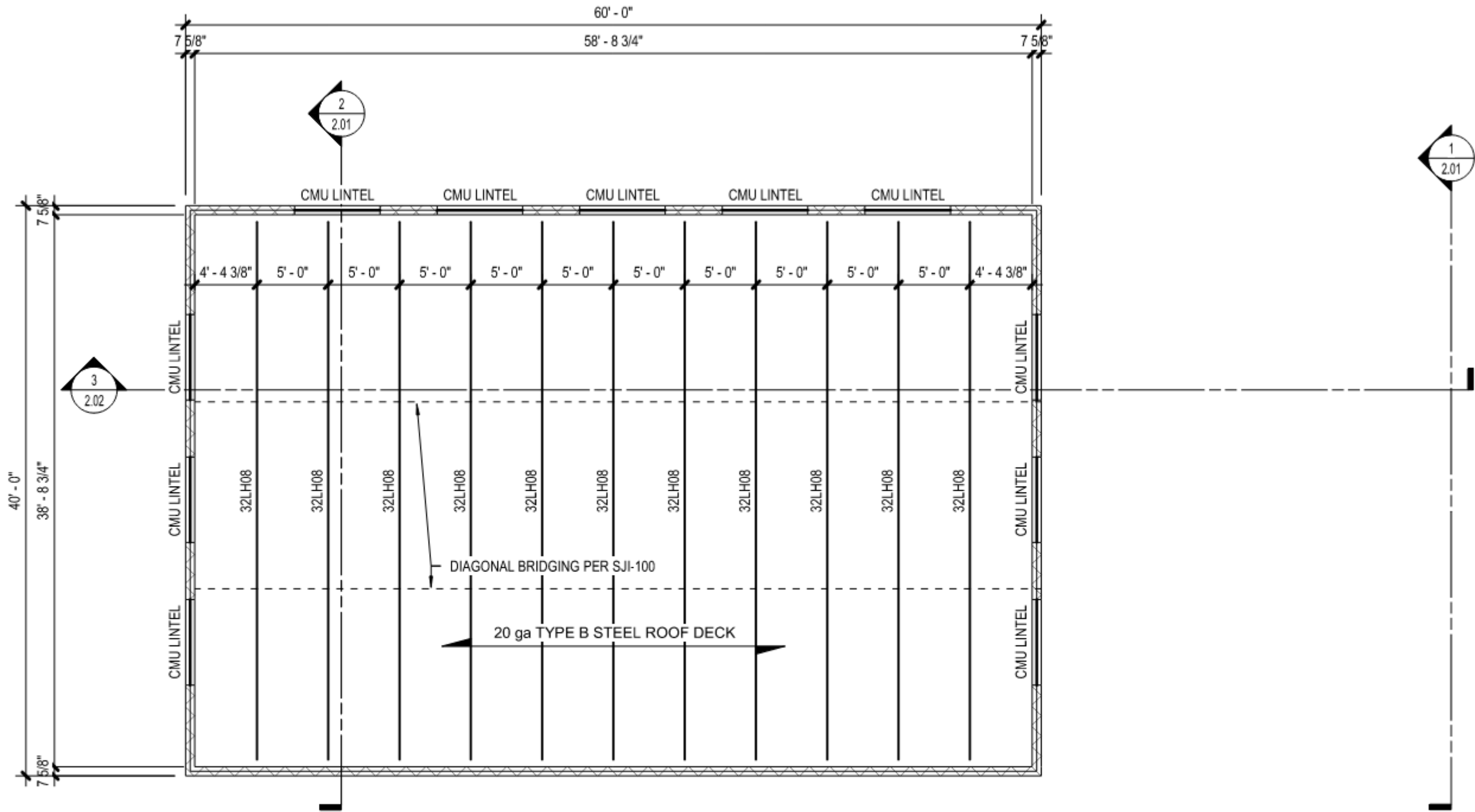
1 FOUNDATION PLAN
1/8" = 1'-0"





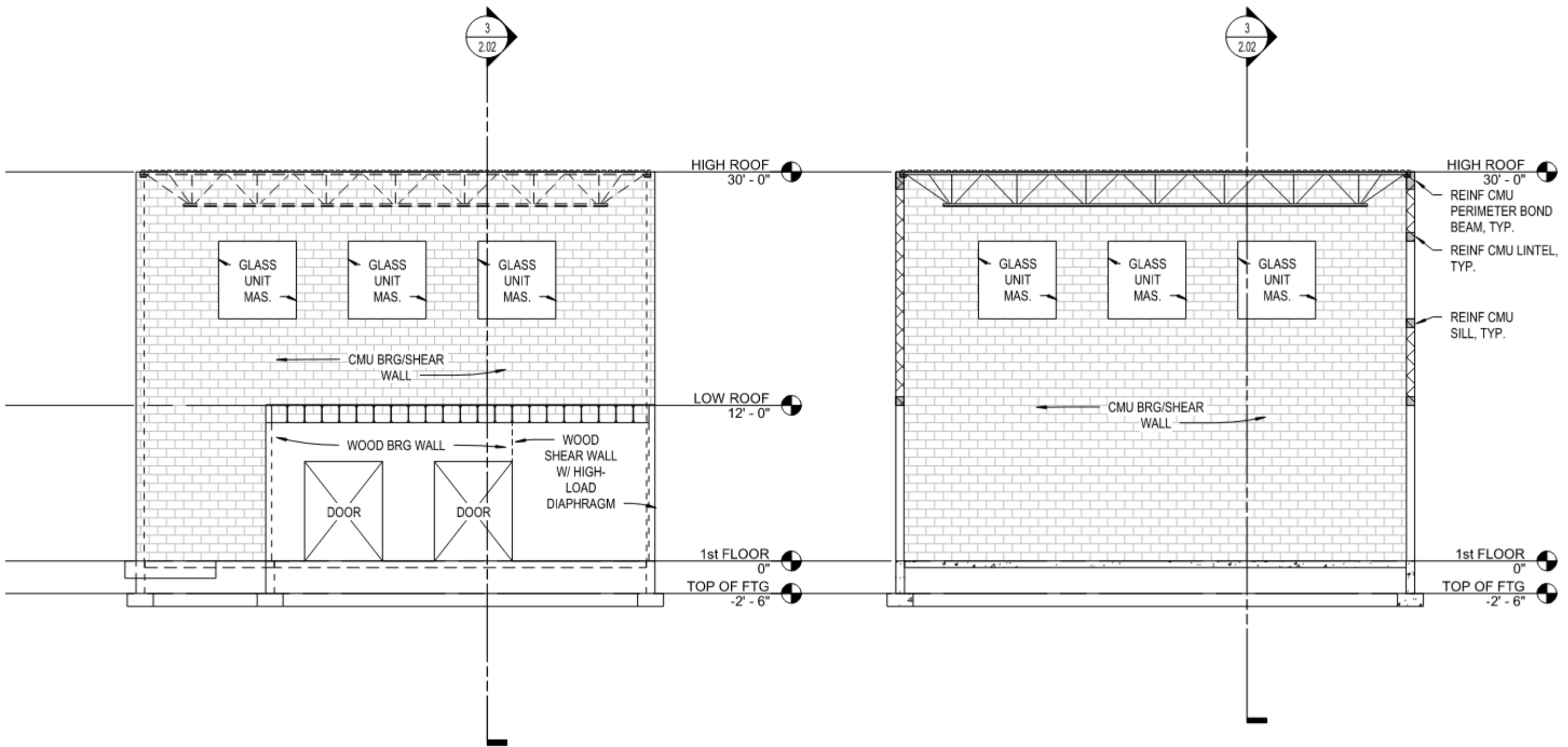
1 LOW ROOF FRAMING PLAN
1/8" = 1'-0"





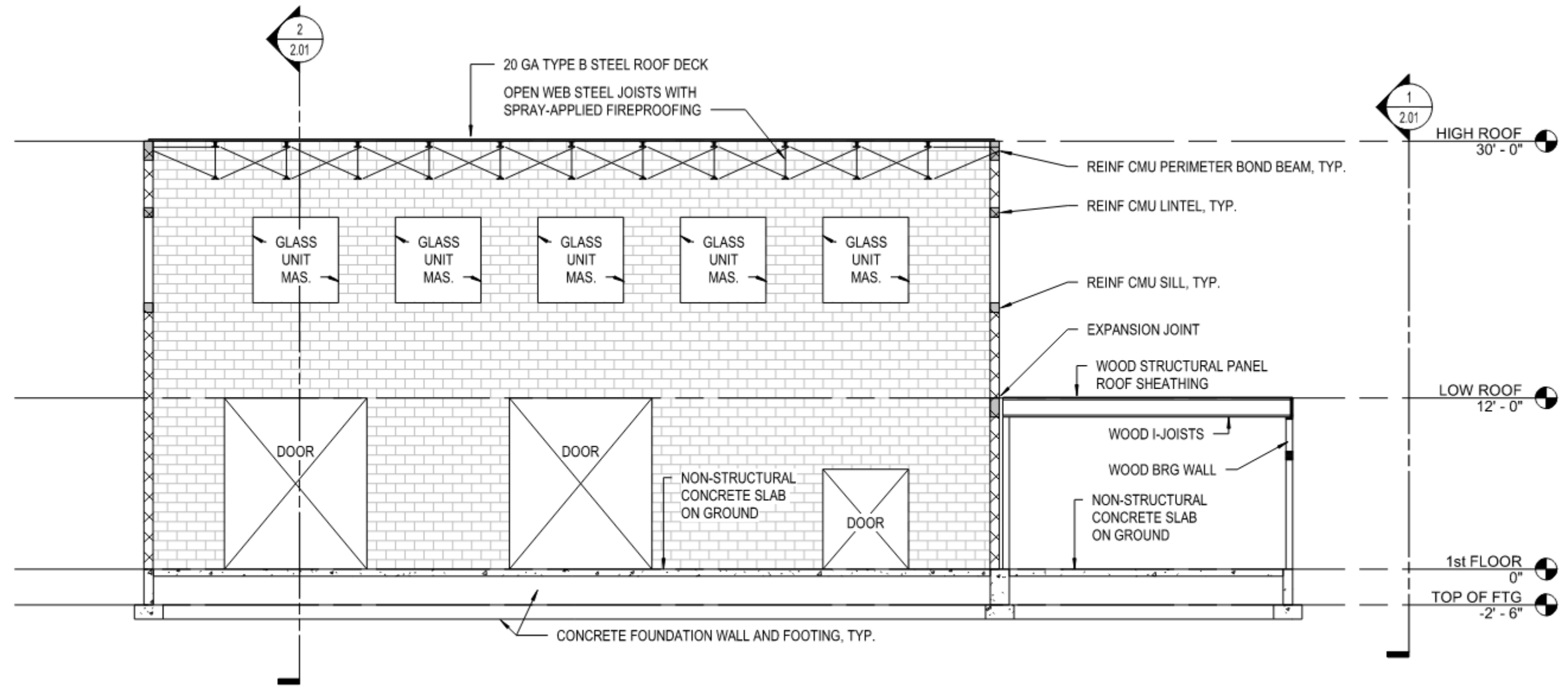
1 HIGH ROOF FRAMING PLAN
 1/8" = 1'-0"





1 Section 1
 1/8" = 1'-0"

2 Section 2
 1/8" = 1'-0"



3 Section 3
 1/8" = 1'-0"

Chapter 17 Scope Aid: Code-Required Special Inspections, Tests, Certificates of Compliance, and Structural Observations

Material or Element			IBC 2021 section that specifies base requirements for ALL structures, (if applicable)	IBC 2021 section that specifies additional TRIGGERED requirements for material or element									
				Seismic Triggers				Wind Trigger	Other Triggers				
				SDC B	SDC C	SDC D	SDC E or F	Exp Cat B w/ V=150+ or Exp Cat C w/ V=140+	High Rise Buildings	Risk Category III	Risk Category IV	Fire Areas containing Group R occupancies with occupant load greater than 250	
Steel Construction	Structural Steel	Welds, fasteners and elements identified in COSP	1705.2.1 --> AISC 360 Chap N										
		Structural steel in the lateral-force resisting system		1705.13.1.2 --> AISC 341	1705.13.1.2 --> AISC 341	1705.13.1.2 --> AISC 341	1705.13.1.2 --> AISC 341						
		Other steel elements of the LFRS Inc. struts, collectors, chords, and foundation elements		1705.13.1.1 --> AISC 341	1705.13.1.1 --> AISC 341	1705.13.1.1 --> AISC 341	1705.13.1.1 --> AISC 341						
		Cold-formed steel deck	1705.2.2 --> SDI QA/QC										
		Open-web steel joists and joist girders	Table 1705.2.3										
	Cold-formed steel light frame construction	Bracing for trusses spanning 60 ft or more	1705.2.4										
		Welding and fastening elements of the LFRS			1705.13.3	1705.13.3	1705.13.3	1705.12.2					
		Roof framing connections						1705.12.3 - 1					
		Special bolted moment frames				1705.13.9	1705.13.9						
	Concrete Construction	(General)	Table 1705.3										
Precast diaphragm connections					Table 1705.3 - 11	Table 1705.3 - 11	Table 1705.3 - 11						
Reinforcement at joints classified as moderate or high deformability elements					Table 1705.3 - 11	Table 1705.3 - 11	Table 1705.3 - 11						
Welding of reinforcing bars		1705.3.1 --> AWS D1.4											
Masonry	(General)	1705.4 --> TMS 402 and TMS 602											
	Glass unit masonry									1705.4.1 --> TMS 602 Level 2			
	Masonry veneer						1705.12.3 - 2			1705.4.1 --> TMS 602 Level 2			
	Vertical masonry foundation elements	1705.4 --> TMS 402 and TMS 602											
Wood, Including Mass Timber	Panelized/prefabricated structural elements and assemblies		1704.2.5										
	Bracing of metal-plate-connected trusses spanning 60 ft or more		1705.5.2										
	Roof deck and roof framing connections							1705.12.3 - 1					
	Elements of the LFRS	High-load diaphragms	1705.5.1										
		Field gluing and fastening			1705.13.2	1705.13.2	1705.13.2	1705.12.1					
	Mass Timber Construction of construction types IV-A, IV-B, and IV-C	(General)	Table 1705.5.3										
Sealants and adhesives in fire-resistance rated assemblies		1705.20											
Soils	Existing site soil conditions, fill placement, and load bearing requirements		Table 1705.6										
Deep Foundations	Driven deep foundations		Table 1705.7										
	Cast-in-place deep foundations		Table 1705.8										
	Helical piles		1705.9										
Seismic Isolation Systems	Isolator units and energy dissipation devices			1705.13.8	1705.13.8	1705.13.8	1705.13.8						

Chapter 17 Scope Aid: Code-Required Special Inspections, Tests, Certificates of Compliance, and Structural Observations

Material or Element		IBC 2021 section that specifies base requirements for ALL structures, (if applicable)	IBC 2021 section that specifies additional TRIGGERED requirements for material or element								
			Seismic Triggers				Wind Trigger	Other Triggers			
			SDC B	SDC C	SDC D	SDC E or F	Exp Cat B w/ V=150+ or Exp Cat C w/ V=140+	High Rise Buildings	Risk Category III	Risk Category IV	Fire Areas containing Group R occupancies with occupant load greater than 250
Fire-Resistant Materials	Sprayed fire-resistant materials	1705.15									
	Mastic and intumescent coatings	1705.16 --> AWC1 12-B									
	Penetrations and joints	Penetration firestops						1705.18.1 --> ASTM E2174	1705.18.1 --> ASTM E2174	1705.18.1 --> ASTM E2174	1705.18.1 --> ASTM E2174
		Fire-resistant joint systems						1705.18.2 --> ASTM E2393	1705.18.2 --> ASTM E2393	1705.18.2 --> ASTM E2393	1705.18.2 --> ASTM E2393
Smoke Control Systems	1705.19.1										
Architectural Components	EIFS	1705.17									
	Access floors				1705.13.5.1	1705.13.5.1					
	Storage racks 8ft or taller				Table 1705.13.7	Table 1705.13.7					
	Roof covering and roof decks						1705.12.3 - 1				
	Interior and exterior nonbearing walls				1705.13.5	1705.13.5					
	Interior veneer				1705.13.5	1705.13.5					
	Exterior wall cladding				1705.13.5	1705.13.5	1705.12.3 - 2				
MEP Components	Electrical equipment for emergency and standby power systems				1705.13.6 - 1	1705.13.6 - 1	1705.13.6 - 1				
	Non-emergency/standby electrical equipment						1705.13.7 - 2				
	Piping and associated units carrying hazardous materials				1705.13.6 - 3	1705.13.6 - 3	1705.13.6 - 3				
	Ductwork carrying hazardous materials				1705.13.6 - 4	1705.13.6 - 4	1705.13.6 - 4				
	Vibration isolation systems w/ 1/4" or less clearance between support frame and restraint				1705.13.6 - 5	1705.13.6 - 5	1705.13.6 - 5				
	Mechanical, electrical, and plumbing equipment installed adjacent to automatic sprinkler systems				1705.13.6 - 6	1705.13.6 - 6	1705.13.6 - 6				
Designated Seismic Systems	Designated seismic systems requiring seismic qualification in accordance with ASCE 7 Section 13.2.2				1705.13.4	1705.13.4	1705.13.4				

Chapter 17 Scope Aid: Code-Required Special Inspections, Tests, Certificates of Compliance, and Structural Observations

Material or Element			IBC 2021 section that specifies base requirements for ALL structures, (if applicable)	IBC 2021 section that specifies additional TRIGGERED requirements for material or element								
				Seismic Triggers				Wind Trigger	Other Triggers			
				SDC B	SDC C	SDC D	SDC E or F	Exp Cat B w/ V=150+ or Exp Cat C w/ V=140+	High Rise Buildings	Risk Category III	Risk Category IV	Fire Areas containing Group R occupancies with occupant load greater than 250
Steel Construction	Structural Steel	Structural steel in the LFRS	1705.14.1.1	1705.14.1.1 --> AISC 341	1705.14.1.1 --> AISC 341	1705.14.1.1 --> AISC 341	1705.14.1.1 --> AISC 341					
		Structural Steel Elements in the LFRS	1705.14.1.2	1705.14.1.2 --> AISC 341	1705.14.1.2 --> AISC 341	1705.14.1.2 --> AISC 341	1705.14.1.2 --> AISC 341					
Concrete Construction	Materials testing		Table 1705.3 and Sect 1705.3.2 --> ACI 318									
	Shotcrete		1704.5 - 4									
	Rebar other than A706 that is to be welded		1704.5 - 6									
	ASTM A615 rebar in the following elements of the LFRS: special moment frames, special structural walls, or coupling beams connecting special walls			1704.5 - 7	1704.5 - 7	1704.5 - 7	1704.5 - 7					
Masonry Construction	(General)		1705.4 --> TMS 402 and 602									
	Glass unit masonry and masonry veneer designed in accordance with Sect 2110 or Chapter 14										1705.4.1 --> TMS 602 Level 2	
Soils			Table 1705.6									
Deep Foundations	Driven deep foundations		Table 1705.7									
	Cast-in-place deep foundations		Table 1705.8									
	Structural integrity of deep foundation elements (when in doubt)		1705.10									
Nonstructural Components	Nonstructural components, supports, or attachments seismically qualified by testing per ASCE 7 Sect 13.2.5			1705.14.2	1705.14.2	1705.14.2	1705.14.2					
Designated seismic systems	Designated seismic systems seismically qualified by testing per ASCE 7 Sect 13.2.5				1705.14.3	1705.14.3	1705.14.3					
Seismic Isolation Systems				1705.14.4 --> Sect 17.8 of ASCE 7	1705.14.4 --> Sect 17.8 of ASCE 7	1705.14.4 --> Sect 17.8 of ASCE 7	1705.14.4 --> Sect 17.8 of ASCE 7					
Smoke Control Systems			1705.19.1									
Sprayed fire-resistant materials			1705.15									
Mastic and Intumescent Fire Resistant Coatings			1705.16 --> 12-B	AWCI								
Glazing	Impact protective systems in windborne debris regions		1709.5.3.1									
	Skylight and sloped glazing where engineering analysis is not provided		1709 and 2405									
Structural materials without design strengths specifically provided for in the building code			1706.2									
Wherever reasonable doubt as to stability or load-bearing capacity of completed construction exists			1708.1									
Proposed construction not capable of being designed and/or analyzed by approved methods for structural capacity and/or deflection compatibility			1709									

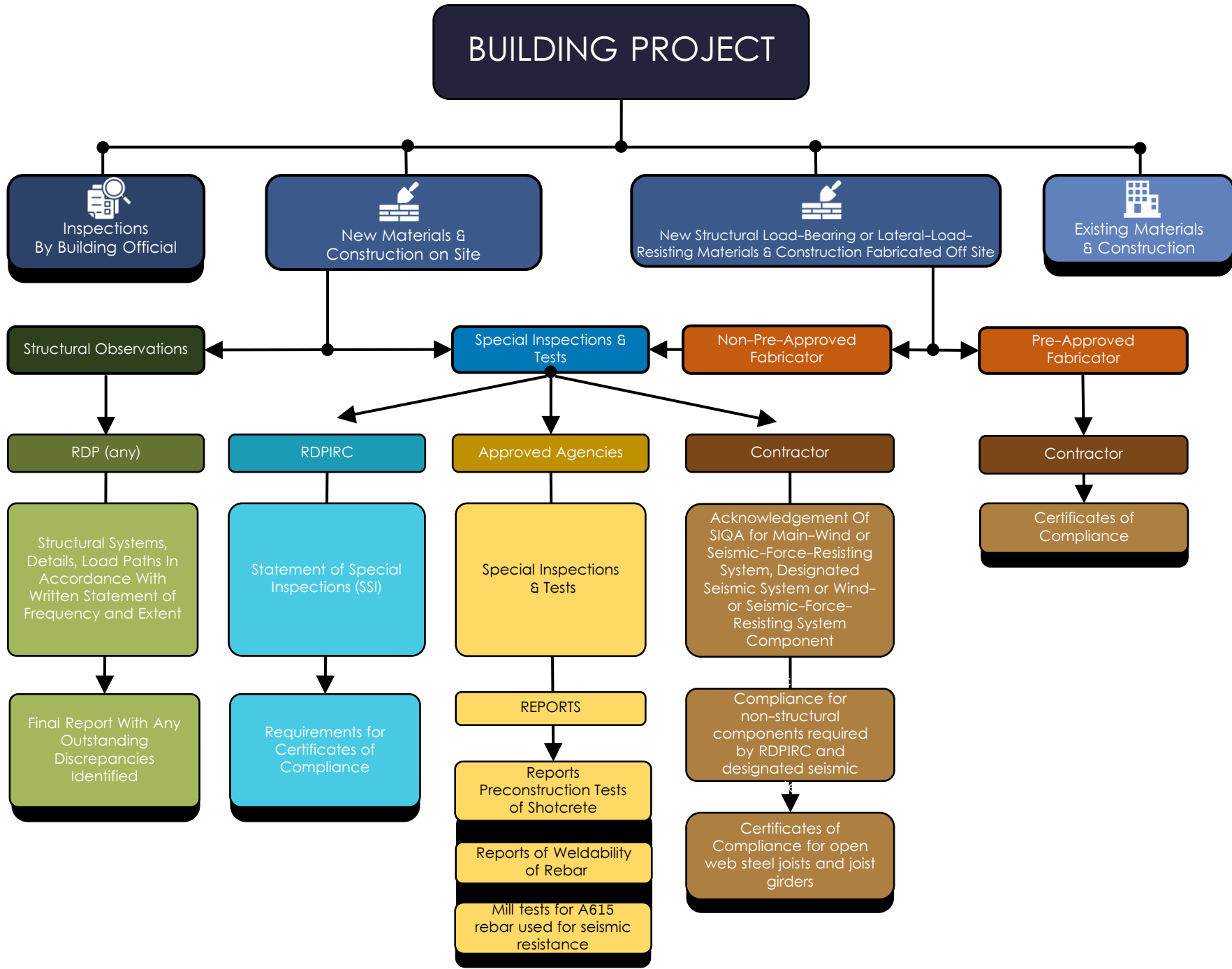
Chapter 17 Scope Aid: Code-Required Special Inspections, Tests, Certificates of Compliance, and Structural Observations

Material or Element	Required Certification	IBC 2021 section that specifies base requirements for ALL structures, (if applicable)	IBC 2021 section that specifies additional TRIGGERED requirements for material or element											
			Seismic Triggers				Wind Trigger	Other Triggers						
			SDC B	SDC C	SDC D	SDC E or F	Exp Cat B w/ V=150+ or Exp Cat C w/ V=140+	High Rise Buildings	Risk Category III	Risk Category IV	Fire Areas containing Group R occupancies with occupant load greater than 250			
Fabrication of Structural, Load-Bearing or LFRS members or assemblies on the premises of an approved fabricator. (Submit to the owner, or owner's authorized agent, for submittal to the building official.)	Work was performed in accordance with the approved construction documents	1704.2.5.1												
Designated seismic systems requiring seismic qualification per ASCE 7 Sect 13.2.2	Active mechanical and electrical equipment	Equipment will remain operable after being subjected to design ground motion		1705.14.3	1705.14.3	1705.14.3								
	Components containing hazardous substances	Equipment shall maintain containment after being subjected to design ground motion		1705.14.3	1705.14.3	1705.14.3								
Non-structural components, supports and attachments requiring seismic qualification per ASCE 7 Sect 13.2.1 Item 2 (Submit to the owner, or owner's authorized agent, for submittal to the building official.)	Architectural components including their supports and attachments	Interior non-structural walls and partitions				1705.14.2	1705.14.2							
		Cantilever elements				1705.14.2	1705.14.2							
		Exterior nonstructural wall elements and connections				1705.14.2	1705.14.2							
		Veneer				1705.14.2	1705.14.2							
		Penthouses				1705.14.2	1705.14.2							
		Ceilings				1705.14.2	1705.14.2							
		Cabinets				1705.14.2	1705.14.2							
		Laboratory equipment				1705.14.2	1705.14.2							
		Access floors				1705.14.2	1705.14.2							
		Appendages and ornaments				1705.14.2	1705.14.2							
	Mechanical and electrical components including their supports and attachments	Signs and billboards	Component, support, or anchorage is seismically qualified for demand loads and displacements by at least one of the following: Analysis, Testing per ASCE 7 Sect 13.2.3, or Experience data per ASCE 7 Sect-13.2.6	1705.14.2	1705.14.2	1705.14.2	1705.14.2							
		Egress stairways				1705.14.2	1705.14.2							
		Air-side HVACR				1705.14.2	1705.14.2							
		Wet-side HVACR				1705.14.2	1705.14.2							
		Air coolers				1705.14.2	1705.14.2							
		Engines				1705.14.2	1705.14.2							
		Elevators				1705.14.2	1705.14.2							
		Escalators				1705.14.2	1705.14.2							
		Generators				1705.14.2	1705.14.2							
		Motor control centers				1705.14.2	1705.14.2							
Communication equipment				1705.14.2	1705.14.2									
Roof mounted stacks				1705.14.2	1705.14.2									
Lighting fixtures				1705.14.2	1705.14.2									
Other				1705.14.2	1705.14.2									
Open-web steel joists and joist girders	Work was performed in accordance with the approved construction documents and with SJI Specifications listed in IBC Sect 2207.1	2207.5, 1704.5												

Chapter 17 Scope Aid: Code-Required Special Inspections, Tests, Certificates of Compliance, and Structural Observations

	Material or Element	IBC 2021 section that specifies base requirements for ALL structures, (if applicable)	IBC 2021 section that specifies additional TRIGGERED requirements for material or element								
			Seismic Triggers				Wind Trigger	Other Triggers			
			SDC B	SDC C	SDC D	SDC E or F	Exp Cat B w/ V=150+ or Exp Cat C w/ V=140+	High Rise Buildings	Risk Category III	Risk Category IV	Fire Areas containing Group R occupancies with occupant load greater than 250
Structural Observations	Structural systems, details, and load paths					1704.6.1 - 3		1704.6	1704.6	1704.6	

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