



# Hospital Inspector Recertification Program

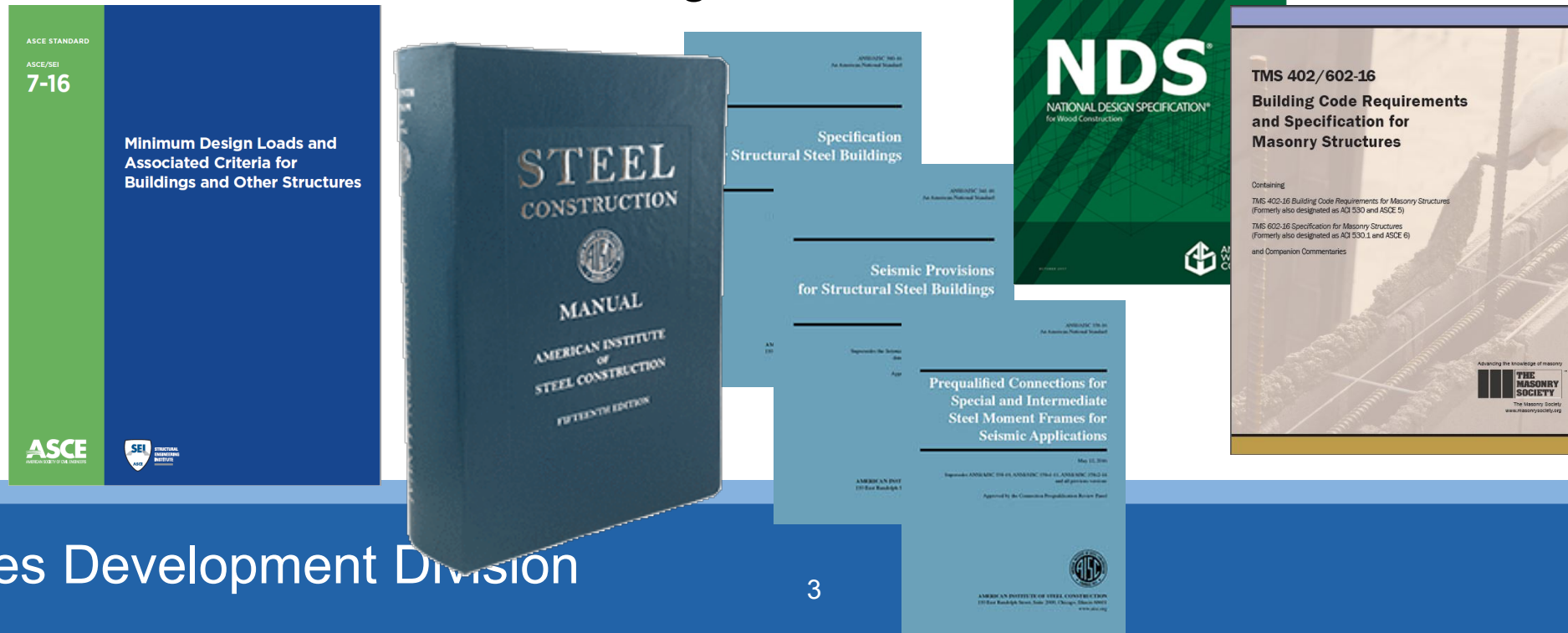
## 2019 California Building Standards Code Structural Presentation

# 2019 California Building Code (CBC 2019)

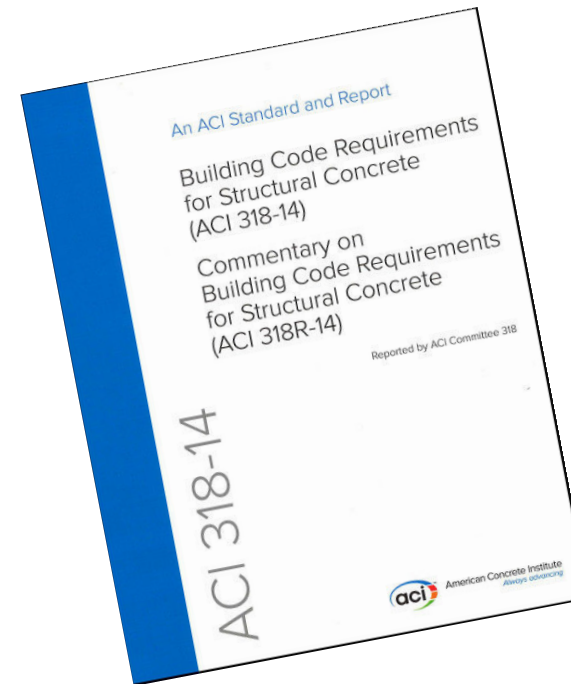


# Major Reference Standards Updated

1. ASCE 7-16: Minimum Design Loads
2. AISC 360-16: Steel Design
3. AISC 341-16/358-16: Seismic Design of Steel
4. TMS-402/602-16: Masonry Design
5. NDS-18: Wood Design



1. ASCE 41-13: Seismic Evaluation and Retrofit of Existing Buildings
2. ACI 318-14: Concrete Design



1. ADM1-15: Aluminum Design
2. SDPWS-15: Special Design Provisions for Wind and Seismic





# OSHPD 1, 1R, 2 and 5 Alignment



## **[OSHPD 1] = Chapter 1224**

General Acute-Care Hospitals including those that provide Rehabilitation Services



## **[OSHPD 1R] = Varies per Intended Use**

Hospital Building removed from General Acute-Care services

## **[OSHPD 2] = Chapter 1225**

Skilled Nursing Facilities and Intermediate Care Facilities

## **[OSHPD 3] = Chapter 1226**

Clinics, including those under H&S Code Section 1200 and Hospital Outpatient Clinical Services provided in a freestanding building un H&S Code Section 1250

## **[OSHPD 4] = Chapter 1227**

Correctional Treatment Centers



## **[OSHPD 5] = Chapter 1228**

Acute Psychiatric Hospitals

# New Definitions

***FIXED EQUIPMENT:*** includes items that are permanently affixed to the building or permanently connected to a service distribution system that is designed and installed for the specific use of the equipment.

***MOVABLE EQUIPMENT*** means equipment, with or without wheels or rollers, that typically remains in one fixed location during its service life or use, but is required to be periodically moved to facilitate cleaning or maintenance.

***MOBILE EQUIPMENT*** means equipment, with or without wheels or rollers, that is typically used in a different location than where it is stored and moved from one location in the structure to another during ordinary use. Mobile equipment are portable, such as wheeled items, portable items, office-type furnishings, and diagnostic or monitoring equipment.

***1617.1.18 ASCE 7, Section 13.1.4. Replace ASCE 7, Section 13.1.4, with the following:***

***13.1.4 Exemptions. The following nonstructural components are exempt from the requirements of this section:***

- 1. Furniture except storage cabinets as noted in Table 13.5-1.*
- 2. Temporary, movable or mobile equipment.*

***Exceptions:***



# New Requirements 2019 CBC



2. Temporary, **movable or mobile** equipment. ...

## **Exceptions:**

a) **Equipment shall be anchored if it is permanently attached to the building utility services such as electricity, gas, or water. For the purposes of this requirement, “permanently attached” shall include all electrical connections except plugs for 110/220 volt receptacles having a flexible cable.**

c) **[OSHPD 1 & 4] Movable equipment shall be anchored by detachable anchors or restraints in a manner approved by the enforcement agency, when utilities and services at the equipment have flexible connections to allow for necessary movement.**

d) **[OSHPD 1 & 4] Mobile equipment heavier than 400 pounds that has a center of mass located 4 feet or more above the adjacent floor or roof level that directly support the equipment shall be restrained in a manner approved by the enforcement agency when not in use and is stored, unless the equipment is stored in an equipment storage room.**

- When is seismic/bracing/anchorage/restraint req'd?
  - Fixed non exempt < 400#(Yes)
  - Fixed > 400# (Yes)
  - Fixed  $\leq$  400# or C.G. > 4' (Yes)
  - Movable > 400# (Yes)
  - Movable  $\leq$  400# or C.G. > 4' (Yes)
  - Mobile > 400# and C.G. > 4' (Yes)
  - Mobile > 400# and C.G. < 4' (Optional)
  - Mobile  $\leq$  400# and C.G. 4' (Optional)
  - Countertop equipment not hard-wired or hard-plumbed (Optional)
  - Countertop equipment hard-wired or hard-plumbed (Yes)
- Use draft "PIN" for reference



- To be used as the basis for construction, inspection or testing
  - Can be easily identified by the OSHPD approval stamp

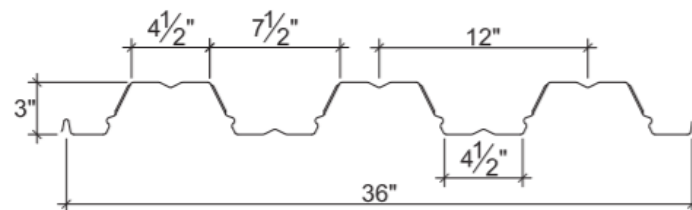


- Material Altering Changes, CAC 7-153(a) – Amended Construction Documents (ACDs) are required. Field staff’s initial as confirmation of reviewed RFIs and follow up with the ACD(s).
- Non-Material Altering (NMA) Changes, CAC 7-153(b) – stamped and signed by the appropriate design professional(s) and subject to concurrence of the field staff as whether or not the change materially alters the work.

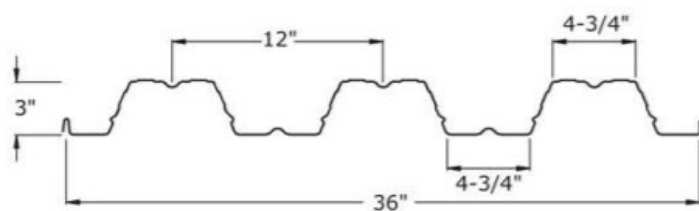
- Specification and use of preapprovals (OPDs and OPMs) does not preempt the plan approval and building permit process, CAC 7-115(d)

- 3" Floor Deck Profiles

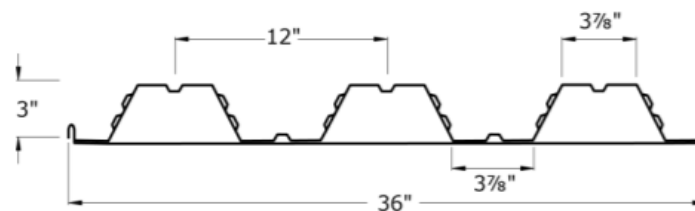
- Verco W3



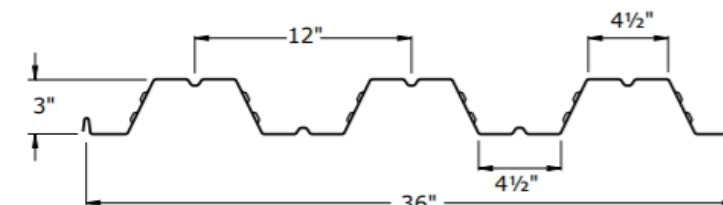
- ASC's 3W/3WF, 3WHF (from Jan 2014) and 3WxH (current)



DG3W-36 & 3W-36



3WHF-36 PROFILE



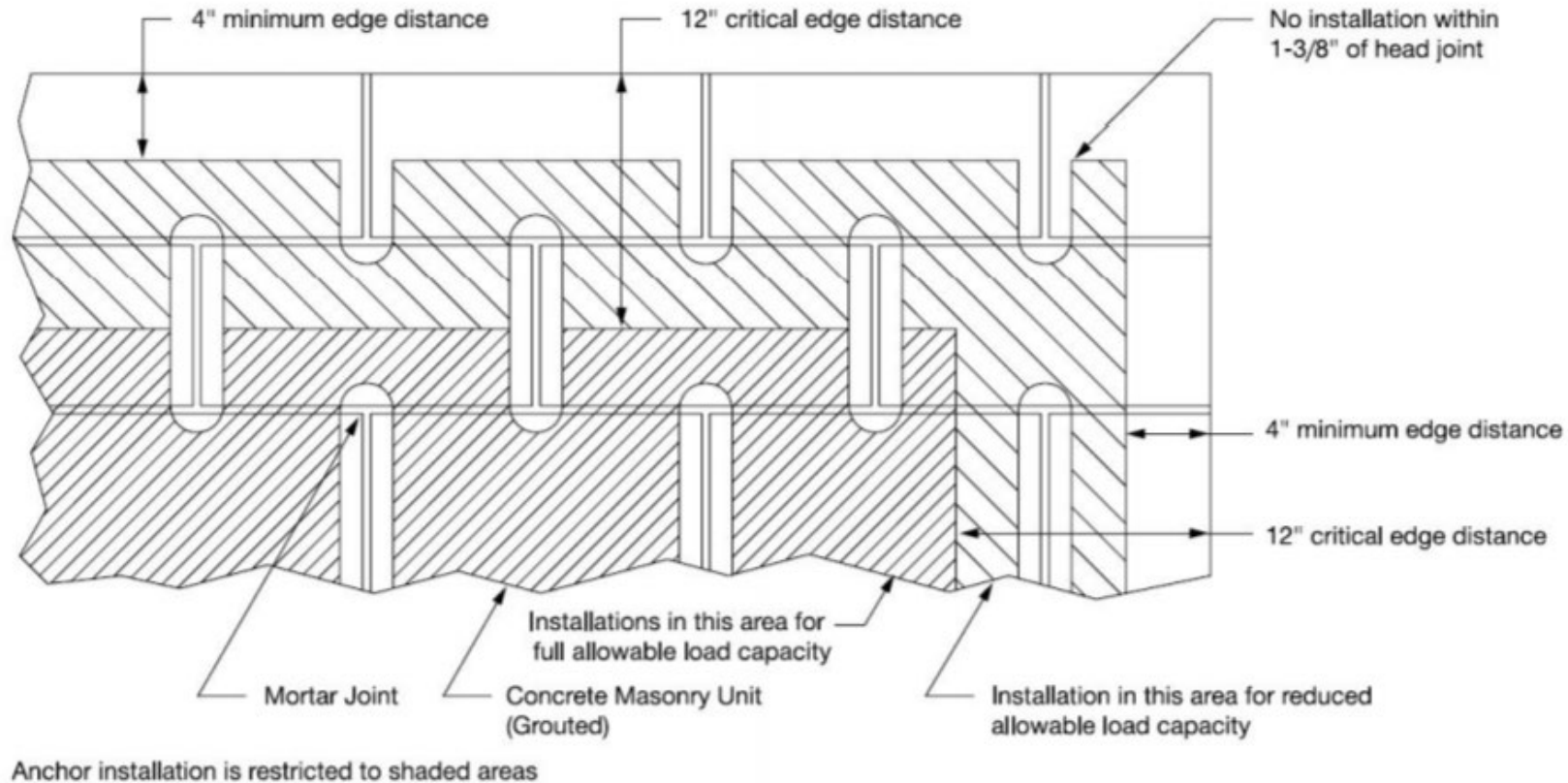
3WxH-36 Profile



# ICC-ES ESRs and MPIIs



- Condition of Use
  - For example, zinc-coated carbon steel wedge anchors is limited to dry, interior use only.
  - Fasteners (including washers and nuts) in contact with preservative-treated and fire-retardant-treated wood shall be zinc-coated carbon steel or stainless steel.
- MPII (Manufacturer's Printed Installation Instructions) – For example, wedge anchors require to be installed in holes drilled by using “carbide-tipped masonry drill bits complying with **ANSI B212.15-1994**”.



**FIGURE 4—ACCEPTABLE INSTALLATION LOCATIONS (SHADED AREAS) FOR KB-TZ ANCHORS IN GROUT-FILLED CONCRETE MASONRY CONSTRUCTION**



# Test Frequency and Acceptance Criteria



- Concrete (and Masonry) Anchors Test Frequency per CBC 1910A.5.3 (0%, 10%,25%, 50% or 100%?)
- 1910A.5.5 for Test Acceptance Criteria
  - Hydraulic ram method (maintain test load for a minimum of **15 seconds**)
  - Torque wrench method (**calibrated** torque wrench shall attain the specified torque within ½ turn of the nut)

- 1704A.2.4 Report Requirement
  - Work inspected or tested was or was not completed in conformance to approved construction documents.
  - Test and Inspection Reports are part of field records hence shall be maintained by the IOR(s) per CAC 7-145(a)6.
- 1704A.2.5.1 Fabricator approval
  - Not permitted by OSHPD.

- 1705A.2.1 Structural Steel (AISC 360 Chapter N & AISC 341 Chapter J)

*AISC 360, Chapter N and AISC 341, Chapter J are adopted, except as noted below:*

*The following provisions of AISC 360, Chapter N are not adopted:*

- 1. N4, Item 2 (Quality Assurance Inspector Qualifications).*
- 2. N5, Item 2 (Quality Assurance).*
- 3. N5, Item 3 (Coordinated Inspection).*
- 4. N5, Item 4 (Inspection of Welding).*
- 5. N6 (Approved Fabricators and Erectors).*
- 6. N7 (Nonconforming Material and Workmanship).*



- 1705A.2.1 Structural Steel (AISC 360 Chapter N & AISC 341 Chapter J)

*Additionally, the requirements of Table 1705A.2.1 of the California Building Code shall apply.*

*In addition to the quality assurance requirements contained in AISC 341, Chapter J, Section J5 (Inspection Tasks), the requirements of Section 1704A.3 and Table 1705A.2.1 of the California Building Code shall apply.*

- Table 1705A.2.1 – Steel Construction
- Table 1705A.3 – Concrete Construction



# Special Seismic Certification – 1705A.13.3.1



- Item #1 thru #24 unchanged.
- Exceptions (Not Required):

- |   |  |
|---|--|
|   | <i>5. Electric motors, base-mounted horizontal pumps, and compressors.</i>                           |
| > |  |
|   | <i>6. Based-mounted vertical pumps up to 20 hp.</i>  |
| > | <i>7. Certified subcomponents up to operating weight of 10 lbs.</i>                                  |
| > | <i>8. Components where importance factor, <math>I_p</math>, is permitted to be 1.0 by this code.</i> |
|   | <i>9. Emergency generators up to 25 kilowatts.</i>   |
|   | <i>10. Equipment and components used for clinical trials only.</i>                                   |
|   | <i>11. Elevator machines and governors.</i>  |

- Exempt Subcomponents – All five items shall be met for substitution without testing:

*For Exceptions 5, 6, and 7:*

*Exempt subcomponents, which are an integral part of equipment that require special seismic certification, shall be tested attached to the equipment. Exempt subcomponents shall be permitted to be substituted without testing, provided that the substituted subcomponent relative to the certified subcomponent has:*

- 1. Similar configuration with equivalent function.*
- 2. Supports and attachments of similar configuration with equivalent strength and stiffness.*
- 3. Same attachment location.*
- 4. Changes in dimensions, center of gravity, and mass, of not more than 10 percent of the certified subcomponent and still meets Exception 5, 6, or 7.*
- 5. Manufacturing process with ISO 9001 certification.*

# 1908A Shotcrete

- Shotcrete shall conform to the requirements of Chapter 17A *and the provisions of ACI 506R. The specified compressive strength of shotcrete shall not be less than **4,000 psi*** (used to be 3,000 psi).
- Concrete or masonry to receive shotcrete shall have *the entire surface **thoroughly cleaned and roughened by a mechanical method acceptable to the enforcement agency*** (used to be only sand blasting), *and just prior to receiving shotcrete shall be thoroughly cleaned of all debris, dirt and dust. Concrete and masonry shall be wetted before shotcrete is deposited, but not so wet as to overcome suction.*
- 1908A.9 Curing – shotcrete shall be maintained above **50F** (used to be 40F).

- 2105A.4 Infrared thermographic survey:



*sampling and testing. [OSHPD 1 & 4] Infrared thermographic surveys or other nondestructive test procedures shall also include core tests with a minimum of two cores taken from each building for each 10,000 square feet (930 m<sup>2</sup>) of the wall.*

- 2105A.5 Masonry prism method testing
  - Prior to the start or during construction – TMS 602 Section 1.4 B.3.
  - Constructed walls – TMS 602 Section 1.4 B.4.
- 2105A.5 Unit strength method testing
  - TMS 602 Section 1.4 B.2.

- 2204A.1 Welding

*2204A.1.1 Restrained welded connections. [OSHPD 1 & 4] Welded structural steel connections having a medium or high level of restraint, as defined by AWS D1.1 Annex H, shall have a minimum pre-heat temperature of not less than 150°F (66°C). Welded structural steel connections with welds to flange, web, wall or plate having a high level of restraint shall maintain a post-heat temperature of 300°F (149°C) for a minimum of 1 hour after completion of welding.*



# 2205A.4 Modifications to AISC 341



- Locations and Dimensions of Protected Zones:

*2205A.4.2 Section A4. Replace Section A4.1 Item (c) as follows:*

*(c) Locations and dimensions of protected zones. The fabricator shall permanently mark protected zones of structural elements in the seismic force-resisting system in the building that are designated on the construction documents. If these markings are obscured during construction, such as after the application of fire protection, the owner's designated representative shall re-mark the protected zones as they are designated on the construction documents. [OSHPD 1 & 4] Primers or paints used to mark protected zones on steel surfaces, which are to receive sprayed fire-resistance material, shall comply with California Building Code Section 704.13.3.2.*



# 2205A.4 Modifications to AISC 341



- Protected Zones – Decking attachments

*2205A.4.3 Section I2. [OSHPD 1 & 4] Replace Section I2.1 Item (d) as follows:*

*(d) Decking attachments that penetrate the beam flange shall not be placed on beam flanges within the*

*protected zone, except power-actuated fasteners up to 0.18 inch in diameter are permitted, provided that the penetration is less than 85 percent of beam flange thickness.*



# 2205A.5.2 Moment Connection



## Magnetic Particle Testing (MT)

- 8. Demand critical fillet welds {2}, {5}, {5a} and {7} shall have Magnetic Particle Testing (MT) in accordance with AWS D1.1 for procedure, technique and acceptance. Inspect the beginning and end of these welds for a 6-inch length, plus any location along the length of the weld where a start and restart is visually noted for a distance of 6 inches on either side of the start/stop location.*

**2211A.1 Structural framing.** For cold-formed steel light-frame construction, the design and installation of the following structural framing systems, including their members and connections, shall be in accordance with AISI S240, and Sections 2211A.1.1 through 2211A.1.3, as applicable:

1. Floor and roof systems.
2. Structural walls.
3. Shear walls, strap-braced walls and diaphragms that resist in-plane lateral loads.
4. Trusses.



# 2213A Testing and Field Verification



## *2213A.1 Tests of high-strength bolts, nuts and washers.*

*High-strength bolts, nuts and washers shall be sampled and tested by an approved agency for conformance with the requirements of applicable ASTM standards.*

- || [OSHPD 1 and 4] A minimum of nine samples per lot, as defined in the ASTM standards for bolts [not nuts and washers], shall be tested for tensile properties in accordance with ASTM F606, but need not exceed three samples per 400 bolts.*

- 2303.2 Fire-retardant-treated wood

**2303.2.4 Labeling.** In addition to the labels required in Section 2303.1.1 for sawn lumber and Section 2303.1.5 for wood structural panels, each piece of fire-retardant-treated lumber and wood structural panels shall be labeled. The label shall contain the following items:

1. The identification mark of an approved agency in accordance with Section 1703.5.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.
5. Flame spread and smoke-developed index.
6. Method of drying after treatment.
7. Conformance with appropriate standards in accordance with Sections 2303.2.5 through 2303.2.8.
8. For fire-retardant-treated wood exposed to weather, damp or wet locations, include the words “No increase in the listed classification when subjected to the Standard Rain Test” (ASTM D2898).

- 2303.6 Nails and staples shall conform to requirements of ASTM F1667, including Supplement 1.
- Requirements for staples:

(3.61 mm). Staples used for framing and sheathing connections shall have minimum average bending moments as follows: 3.6 in.-lbs (0.41 N-m) for No. 16 gage staples, 4.0 in.-lbs (0.45 N-m) for No. 15 gage staples, and 4.3 in.-lbs (0.49 N-m) for No. 14 gage staples.



# 2304.8.2 Structural Roof Sheathing



Roof sheathing conforming to the provisions of Table 2304.8(1), 2304.8(2), 2304.8(3) or 2304.8(5) shall be deemed to meet the requirements of this section. Wood structural panel roof sheathing shall be of a type manufactured with exterior glue (Exposure 1 or Exterior).



# Table 2304.10.1 Fastening Schedule



- Some changes, for example 4-16d box (used to be 3-16d box)

7. Roof rafters to ridge valley or hip rafters; or roof rafter to 2-inch ridge beam	2-16d common (3 <sup>1</sup> / <sub>2</sub> " × 0.162"); or 3-10d box (3" × 0.128"); or 3-3" × 0.131" nails; or 3-3" 14 gage staples, 7/ <sub>16</sub> " crown; or	End nail
	3-10d common (3" × 0.148"); or 4-16d box (3 <sup>1</sup> / <sub>2</sub> " × 0.135"); or 4-10d box (3" × 0.128"); or 4-3" × 0.131" nails; or 4-3" 14 gage staples, 7/ <sub>16</sub> " crown	Toenail

*(continued)*

- Fasteners and connectors (including nuts and washers) in contact with preservative-treated and fire-retardant-treated wood
  - The coating weights for zinc-coated fasteners – ASTM A153.
  - Stainless steel driven fasteners – ASTM F1667.
  - Added staples as one type of fasteners – Shall be stainless steel.

## Part 10 – California Existing Building Code

### Relocation of Chapter 34A to new CEBC “A” Chapters:

#### Exception:

**SPC-1 and SPC-2 (OSHPD 1R)  
Additions, Alterations, Repairs &  
Voluntary Seismic  
Improvements...**

**Adopt IEBC Chapters 2, 3, 4  
and 5 at the life safety  
performance level.**

2016 CBC Chapter 34A		2019 CEBC	
Description	Section	Section	Notes
Additions, alterations and repairs	3401A.1.1	301A.1	Modify 301
Maintenance	3401A.2	302A.7	Modify 302
Compliance	3401A.3	302A.3	Modify 302
Building material, equipment and Systems	3401A.4	302A.4	Modify 302
Existing seismic force resisting systems	3401A.4.3	302A.4.1	Modify 302
Definitions	3402A	202A	Modify 202
Additions	3403A	502A	Modify 502
Alterations	3404A	503A	Modify 503
Repairs	3405A	405A	Modify 405
Glass Replacement	3407A	402A.1	Modify 402
Change of Occupancy/Function	3408A	506A	Modify 506
Seismic Retrofit Pre-1973 buildings	3411A	303A.3	Modify 303.3
Compliance Alternatives for Seismic Retrofit	3412A	303A.3	Modifv 303.3

# Questions

