# FINAL EXPRESS TERMS FOR PROPOSED BUILDING STANDARDS OF THE OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT REGARDING THE 2019 CALIFORNIA BUILDING CODE CALIFORNIA CODE OF REGULATIONS, TITLE 24, PART 2, VOLUME 2

# (OSHPD 03/19)

The State agency shall draft the regulations in plain, straightforward language, avoiding technical terms as much as possible and using a coherent and easily readable style. The agency shall draft the regulation in plain English. A notation shall follow the express terms of each regulation listing the specific statutes authorizing the adoption and listing specific statutes being implemented, interpreted, or made specific (Government Code Section 11346.2(a)(1)).

If using assistive technology, please adjust your settings to recognize underline, strikeout, italic and ellipsis.

## LEGEND for EXPRESS TERMS (Based on model codes - Parts 2, 2.5, 3, 4, 5, 9, 10)

* Model Code language appears upright
* Existing California amendments appear in *italic*
* Amended model code or new California amendments appear *underlined & italic*
* Repealed model code language appears ~~upright and in strikeout~~
* Repealed California amendments appear in *~~italic and strikeout~~*
* Ellipsis (...) indicate existing text remains unchanged

# FINAL EXPRESS TERMS

# Item: 1

**Chapter:** **CHAPTER 16 STRUCTURAL DESIGN**

**Section:** **SECTION 1613 EARTHQUAKE LOADS, *1613.4 – Component Importance Factors. [OSHPD 1R, 2 & 5].***

**Express Terms:**

**CHAPTER 16**

**STRUCTURAL DESIGN**

…

**SECTION 1613 EARTHQUAKE LOADS**

…

***1613.4 Component Importance Factors. [OSHPD 1R, 2 & 5]*** *Nonstructural components designated below shall have a component importance factor, Ip, equal to 1.5:*

1. *For components that are required for life-safety purposes after an earthquake, including emergency and standby power systems, mechanical smoke removal systems, fire protection sprinkler systems and fire alarm control panels.*
2. *For medical equipment~~, mechanical and electrical components and components~~ required for patient life support ~~for patients~~.*

…

**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

# Item: 2

**Chapter: CHAPTER 16A STRUCTURAL DESIGN**

**Section:** **SECTION 1617*A* MODIFICATIONS TO ASCE 7, *1617A.1.18 ASCE 7, Section 13.1.4. (for OSHPD see Section 13.1.4.a)***

**Express Terms:**

**CHAPTER 16A**

**STRUCTURAL DESIGN**

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**SECTION 1617*A* MODIFICATIONS TO ASCE 7**

…

***1617A.1.18 ASCE 7, Section 13.1.4.*** *Replace ASCE 7, Section 13.1.4, with the following: [****DSA-SS, for OSHPD see Section 13.1.4.a****]*

***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:***

1. *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.*
2. ***[DSA-SS]*** *Movable or mobile equipment which is heavier than 400 pounds or has a center of mass located 4 feet (1.22 m) or more above the adjacent floor or roof level that directly support the component, shall be restrained in a manner approved by the enforcement agency, Mobile equipment shall be restrained when not in use and is stored, unless the equipment is stored in a storage room that does not house hazardous materials or any facility systems or fixed equipment that can be affected by mobile equipment lacking restraint.*
3. ***~~[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.~~*
4. ***~~[OSHPD 1 & 4]~~*** *~~Mobile equipment heavier than 400 pounds that has a center of mass located 4 feet (1.22 m) 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.~~*
5. *Discrete architectural, mechanical and electrical components and fixed equipment in Seismic Design Category D, E or F that are positively attached to the structure and anchorage is detailed on the plans, provided that either:*
6. *The component weighs 400 pounds (1780 N) or less, the center of mass is located 4 feet (1.22 m) or less above the adjacent floor or roof level that directly supports the component, and flexible connections are provided between the component and associated ductwork, piping and conduit.*

***Exception:*** *Special Seismic Certification requirements of this code in accordance with Section 1705A.13.3 shall be applicable.*

*or*

1. *The component weighs 20 pounds (89 N) or less or, in the case of a distributed system, 5 lb/ft (73 N/m) or less.*

***Exception:*** *The enforcement agency shall be permitted to require attachments for equipment with hazardous contents to be shown on construction documents irrespective of weight.*

***13.1.4.a [OSHPD 1, 1R, 2, 4 & 5].*** *The following nonstructural components and equipment shall be anchored in accordance with this section. Design and detailing shall be in accordance with Chapter 13 except as modified by this section.*

1. *Fixed Equipment: Equipment shall be anchored if it is directly attached to the building utility services such as electricity, gas, or water. For the purposes of this requirement, “directly attached” shall include all electrical connections except plugs for 110/220-volt receptacles having a flexible cable/cord. Equipment that is connected to the building plumbing system with a shut-off valve in proximity to the equipment shall not be considered as directly attached provided the inside diameter of the pipe/tubing is less than ½ inches.*
2. *Movable Equipment: Equipment is subject to the same requirement as fixed equipment, but is permitted to be anchored by re-attachable anchors or restraints in a manner approved by the enforcement agency. Utilities and services at the equipment shall have flexible connections to allow for necessary movement.*
3. *Mobile equipment: Equipment heavier than 400 lb that has a center of mass located 4 ft. 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 stored and not in use, unless the equipment is stored in an equipment storage room.*
4. *Countertop Equipment: Countertop Equipment shall be subject to the same anchorage or restraint requirements for fixed, movable, mobile or other equipment as applicable.*
5. *Temporary Equipment: Equipment for uses greater than 30 days but less than or equal to 180-days and where this section requires supports and attachments, the following shall apply:*
   * 1. *Seismic design for supports and attachments for temporary equipment shall meet the requirements of Chapter 13; however, the calculated Fp may be reduced by 50%.**It is acceptable to use ballasts for seismic bracing supports and attachments and to limit the design criteria to overturning unless directly or indirectly supported by the building structure.*
     2. *Wind design speeds may be reduced as prescribed in ASCE 37-14 or other standard approved by OSHPD.*
     3. *Temporary piping, conductors and ductwork shall be supported. Seismic design for supports and attachments of temporary piping, conductors and ductwork is not required.*
6. *Interim Equipment:*
   1. *Seismic design for supports and attachments for interim equipment shall meet the requirements of Chapter 13. It is acceptable to use ballasts for seismic or wind bracing supports and attachments.*
   2. *Wind design speeds may be reduced as prescribed in ASCE 37-14 or other standard approved by OSHPD.*
   3. *Piping, conductors and ductwork shall be supported. Seismic design for supports and attachments of piping, conductors and ductwork is not required.*
7. *Other Equipment: Equipment shall be anchored where any of the following apply:*
8. *Essential to hospital operations and weight of equipment is greater than 100 lb.*
9. *Could fall within the patient care vicinity as defined in Article 517.2 of the California Electrical Code.*
10. *Could fall and block a required means of egress. Weight of equipment is greater than 400 lb.*
11. *Weight of equipment is greater than 200 lb. and center of mass located greater than 4 ft. measured from the finished floor.*
12. *Equipment with hazardous contents.*
13. *Other architectural, mechanical and electrical components stated in Chapter 13.*

***Exemptions:***

1. *Furniture except storage cabinets as noted in Table 13.5-1*
2. *Nonstructural components and equipment, that are attached to the building, provided that the component weighs 20 lb or less or, in the case of a distributed system, 5 lb/ft or less. Seismic design and seismic details need not be provided.*
3. *Seismic design need not be provided for discrete architectural, mechanical and electrical components and equipment that are attached to the building and anchorage is detailed on the plans, provided that the component weighs 400 lb or less, and the center of mass is located 4 ft. or less above the adjacent floor or roof level that directly support the component and flexible connections are provided between the component and associated ductwork, piping and conduit where required.*

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**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

# Item: 3

**Chapter:** **CHAPTER 16A STRUCTURAL DESIGN**

**Section:** **SECTION 1617*A* MODIFICATIONS TO ASCE 7, *1617A.1.26 ASCE 7, Section 13.6.7.3. Additional Provisions for Piping and Tubing Systems.***

**Express Terms:**

**CHAPTER 16A**

**STRUCTURAL DESIGN**

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**SECTION 1617*A* MODIFICATIONS TO ASCE 7**

…

***1617A.1.26 ASCE 7, Section 13.6.7.3*.** *Replace ASCE 7, Section 13.6.7.3 with the following:*

***13.6.7.3 Additional Provisions for Piping and Tubing Systems*.**

*A) Design for the seismic forces of Section 13.3 shall not be required for piping systems where flexible connections, expansion loops, or other assemblies are provided to accommodate the relative displacement between component and piping, where the piping system is positively attached to the structure, and where any of the following conditions apply:*

1. *Trapeze assemblies are supported by 3/8-inch (10 mm) or ½-inch (13 mm) diameter rod hangers not exceeding 12 inches (305 mm) in length from the pipe support point to the connection at the supporting structure, ~~do not support piping with Ip greater than 1.0,~~ and no single pipe exceeds the diameter limits set forth in Item 2b below or 2 inches (50 mm) for Seismic Design Category D, E, or F where Ip is greater than 1.0 and the total weight supported by any single trapeze is 100 pounds (445 N) or less; or*
2. *Piping …*

…

**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

# Item: 4

**Chapter:** **CHAPTER 17*A* SPECIAL INSPECTIONS AND TESTS**

**Section:** **SECTION 1705*A* REQUIRED SPECIAL INSPECTIONS AND TESTS, 1705*A*.12.5 Architectural components.**

**Express Terms:**

**CHAPTER 17*A***

**SPECIAL INSPECTIONS AND TESTS**

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**SECTION 1705*A* REQUIRED SPECIAL INSPECTIONS AND TESTS**

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**1705*A*.12.5 Architectural components.** Periodic special inspection is required for the erection and fastening of exterior cladding, interior and exterior nonbearing walls*,* ceilings, and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F.

***[OSHPD 1] E*x*ception:*** *Periodic special inspection is not required where continuous inspection of the work is performed in accordance with Section 7-145 of the CAC*.

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**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

# Item: 5

**Chapter:** **CHAPTER 17*A* SPECIAL INSPECTIONS AND TESTS**

**Section:** **SECTION 1705*A* REQUIRED SPECIAL INSPECTIONS AND TESTS, 1705*A*.13.3.1 [OSHPD 1 & 4].**

**Express Terms:**

**CHAPTER 17*A***

**SPECIAL INSPECTIONS AND TESTS**

…

**SECTION 1705*A* REQUIRED SPECIAL INSPECTIONS AND TESTS**

…

***1705A.13.3.1 [OSHPD 1 & 4]*** *Special seismic certification shall be required for the following systems, equipment, and components:*

*…*

*~~7. Fluoroscopy and x-ray equipment required for radiological/diagnostic imaging service (for service requirements see CBC Section 1224.18.1), and any fluoroscopy and/or radiographic system provided in support of diagnostic assessment of trauma injuries.~~*

*7. Imaging equipment needed for diagnostic services of emergency/trauma patients, a minimum of one such equipment.*

*~~8. CT (Computerized Tomography) systems used for diagnostic assessment of trauma injuries.~~*

*~~Exception: CT equipment used for treatment or in hybrid operating rooms, including those used for interventional CT, unless used for diagnostic assessment of trauma injuries.…~~*

*~~9~~8. Air conditioning units excluding Variable/Constant Air Volume (VAV/CAV) boxes up to 75 lbs.*

*~~10~~9. Air handling units.*

*1~~1~~0. Chillers, including associated evaporators, and condensers.*

*1~~2~~1. Cooling towers.*

*1~~3~~2. Transformers.*

*1~~4~~3. Electrical substations.*

*1~~5~~4. UPS and batteries.*

*1~~6~~5. Panelboards as defined in the California Electrical Code (CEC) Article 100.*

*1~~7~~6. Industrial control panels as defined in the California Electrical Code (CEC) Article 100.*

*1~~8~~7. Power isolation and correction systems.*

*1~~9~~8. Motorized surgical lighting systems.*

*~~20~~19. Motorized operating table systems.*

*2~~1~~0. Internal communication servers, ~~and~~ routers, and switches failure of which could impair the continued operation of the facility.*

*2~~2~~1. Medical gas and vacuum systems.*

*2~~3~~2. Electrical busways as defined in UL 857.*

*2~~4~~3. Electrical control panels powered by the life safety branch in accordance with the California Electrical Code (CEC) Article 517.32 or the critical branch in accordance with the California Electrical Code (CEC) Article 517.33.*

***Exceptions:***

* + - 1. *Equipment and components weighing not more than 50 lbs. supported directly on structures or surface mounted on equipment or components that are not required to have special seismic certification by this section.*
      2. *Mobile equipment/components.*
      3. *Pipes, ducts, conduits and cable trays excluding in-line equipment and components.*
      4. *Underground tanks.*
      5. *Electric motors, base-mounted horizontal pumps, and compressors.*
      6. *Based-mounted vertical pumps up to 20 hp.*
      7. *Certified subcomponents up to operating weight of 10 lbs.*
      8. *Components where importance factor, Ip, is permitted to be 1.0 by this code.*
      9. *Emergency generators up to 25 kilowatts.*
      10. *Equipment and components used for clinical trials only.*
      11. *Elevator machines and governors.*
      12. *Temporary and Interim equipment.*

…

**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

# Item: 6

**Chapter:** **CHAPTER 18*A* SOILS AND FOUNDATIONS**

**Section:** **SECTION 1809*A* SHALLOW FOUNDATIONS, 1809*A*.10 Pier and curtain wall foundations.**

**Express Terms:**

**CHAPTER 18*A***

**SOILS AND FOUNDATIONS**

…

**SECTION 1809A SHALLOW FOUNDATIONS**

…

**1809*A*.10 Pier and curtain wall foundations.** ~~Reserved.~~*Not permitted* by DSA –SS, DSA –SS/CC, or *OSHPD.*

…

**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

# Item: 7

**Chapter:** **CHAPTER 21 MASONRY**

**Sections:**

**SECTION 2103 MASONRY CONSTRUCTION MATERIALS**

**SECTION 2104 CONSTRUCTION**

**SECTION 2105 QUALITY ASSURANCE SECTION**

**SECTION 2106 SEISMIC DESIGN SECTION 2106 SEISMIC DESIGN**

**SECTION 2107 ALLOWABLE STRESS DESIGN**

**Express Terms:**

**CHAPTER 21**

**MASONRY**

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**SECTION 2103 MASONRY CONSTRUCTION MATERIALS**

…

***2103.5******Air entrainment.******[OSHPD 1R, 2 & 5]*** Air-entraining ~~substances~~ *materials or air-entraining admixtures* shall not be used in grout unless tests are conducted to determine compliance with the requirements of this code.

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**CHAPTER 21**

**MASONRY**

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**SECTION 2104 CONSTRUCTION**

…

***2104.2 Grouted masonry. [OSHPD 1R, 2 & 5]***

***2104.2.1 General conditions.***

…

*~~Grout pours greater than 12 inches (300 mm) in height shall be consolidated by mechanical vibration during placement to fill the grout space before loss of plasticity, and reconsolidated by mechanical vibration to minimize voids due to water loss. Grout pours less than 12 inches in height may be puddled.~~ Grout pours shall be consolidated in accordance with the requirements of TMS 602, Article 3.5E.*

*Between grout pours or where grouting has been stopped more than an hour, a horizontal construction joint shall be formed by stopping all wythes at the same elevation and with the grout stopping a minimum of 11/2 inches (38 mm) below a mortar joint, except at the top of the wall. Where bond beams occur, the grout pour shall be stopped a minimum of 1/2 inch (12.7 mm) below the top of the masonry.*

*~~The construction documents shall completely describe grouting procedures, subject to approval of OSHPD~~.*

*…*

**CHAPTER 21**

**MASONRY**

…

**SECTION 2105 QUALITY ASSURANCE**

…

***2105.2 Compressive Strength, f*** *′****m. [OSHPD 1R, 2 & 5]*** *The minimum specified compressive strength, f 'm, ~~assumed~~ in the design shall be 2000 psi (13.79MPa) for all masonry construction using materials and details of construction required herein. Testing of the constructed masonry shall be provided in accordance with Section 2105.5 or Section 2105.6.*

***Exception:*** *~~Subject to the approval of the enforcement agency, h~~Higher values of f'm may be used in the design of reinforced grouted masonry and reinforced hollow-unit masonry~~. The approval shall be~~ based on prism test results submitted by the architect or engineer to the enforcement agency which demonstrate the ability of the proposed construction to meet prescribed performance criteria for strength ~~and stiffness. The design shall take into account the mortar joint depth~~. In no case shall the f'm ~~assumed~~ used in design exceed 3,000 psi (20.7MPa).*

…

***2105.3 Mortar and grout tests. [OSHPD 1R, 2 & 5]*** *These tests are to establish whether the masonry components meet the specified component strengths.*

*At the beginning of all masonry work, at least one test sample of the mortar shall be taken on three successive working days and at least at one-week intervals thereafter. Samples of grout shall be taken for each mix design, each day grout is placed, and not less than every 5,000 square feet of masonry wall area. They shall meet the minimum strength requirement given in ASTM C270 Table 1 ~~and TMS 402 Section 7.4.4.2.2~~ for mortar and ASTM C476/TMS 602 Section 2.2 for grout. Additional samples shall be taken whenever any change in materials or job conditions occur, as determined by the building official. When the prism test method in accordance with Section 2105.5 is used during construction, the tests in this section are not required.*

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**CHAPTER 21**

**MASONRY**

…

**SECTION 2106 SEISMIC DESIGN**

…

**2106.1 Seismic design requirements for masonry.**

…

***2106.1.1 Modifications to TMS 402. [OSHPD 1R, 2 & 5]*** *Modify TMS 402 Section 7.4.4 as follows:*

*…*

*2.*  ***Minimum reinforcement for masonry columns****. The spacing of column ties shall be as follows: not greater than 8 bar diameters, ~~24 tie diameters, or~~ one half the least dimension of the column for the full column height, or 8 inches. Ties shall be at least 3/8” in diameter and shall be embedded in grout. Top tie shall be within 2 inches (51 mm) of the top of the column or of the bottom of the horizontal bar in the supported beam.*

*…*

**CHAPTER 21**

**MASONRY**

…

**SECTION 2107 ALLOWABLE STRESS DESIGN**

…

***2107.4 [OSHPD 1R, 2 & 5] TMS 402, Section 8.3.7, maximum bar size.******[OSHPD 1R, 2 & 5]*** *Add the following to Chapter 8:*

*8.3.7 – Maximum bar size. The maximum bar diameter shall conform to the requirements of TMS 402, Section 9.3.3.1 ~~not exceed one-eighth of the nominal wall thickness and shall not exceed one-quarter of the least dimension of the cell, course or collar joint in which it is placed, nor be larger than No. 9 in size~~.*

…

***2107.6 [OSHPD 1R, 2 & 5] Modify TMS 402, Section 8.3.4.4 by the following:***

*~~All r~~Reinforced masonry walls, columns, pilasters, beams and lintels ~~components~~ that are subjected to in-plane forces shall have a maximum flexural tensile reinforcement ratio, ρmax, not greater than that computed by equation 8-20.*

*…*

**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

Item: 8

**Chapters:**

**CHAPTER 22 STEEL**

**CHAPTER 22*A* STEEL**

**Sections:**

**SECTION 2205 STRUCTURAL STEEL**

**SECTION 2205*A* STRUCTURAL STEEL**

**Express Terms:**

**CHAPTER 22**

**STEEL**

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**SECTION 2205 STRUCTURAL STEEL**

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***2205.4*** ***Modifications to AISC 358. [OSHPD 1R, 2 & 5]***

***2205.4.1 Design Requirements, 2.1 Special and Intermediate Moment Frame Connection Types, Table 2-1 Prequalified Moment Connections modifications.*** *The prequalified bolted moment connections are not permitted in buildings.*

***Exceptions:***

1. *Erection bolts are permitted.*
2. *The approved bolted moment connection in accordance with AISC 358 Chapter 10 as permitted by the exception to Section 2206A.2 and AISC 358-16 Supplement No. 1, Chapter 11.*
3. *Single-story Type V skilled nursing or intermediate care facilities utilizing wood-frame or light steel-frame construction.*

***2205.4.2 Moment Connection - Chapter 11.*** *The welded sideplate steel moment connection shall be permitted provided:*

1. *The beams shall consist of either rolled or built-up wide flange sections.*
2. *The biaxial dual-strong axis and column minor axis configurations of the moment connection shall be considered as an alternative system.*
3. *For SMF and IMF systems, U-shaped cover plates shall be used and the hinge-to-hinge span to beam depth, Lh/d, shall be greater than or equal to 5.*
4. *The width-to-thickness ratios for beam flanges shall not be less than 3.*
5. *The spacing for lateral bracing of wide flange beams, Lb, shall include the length of the side plate at beam ends.*
6. *The extension of the side plates beyond the face of the column shall be within the range of 0.77d to 1.0d.*
7. *The gap-to-side plate thickness ratio shall range from 2.1 to 2.3.*
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.*

***2205.4.3 Bolted Moment Connection - Chapter 11, Supplement No. 1.*** *The bolted sideplate steel moment connection in accordance with AISC 358-16 Supplement No. 1 shall be permitted provided:*

1. *A linear analysis procedure shall be used for design of the SMF and IMF systems using the bolted sideplate connection when permitted in accordance with ASCE 7. Nonlinear procedures will be considered as an alternative system.*
2. *The beams shall consist of either rolled or built-up wide flange sections. Columns shall consist of rolled or built-up wide flange sections or non-composite built-up box or HSS with a minimum wall thickness of 3/4 inch, or satisfy the requirements of width-to-thickness ratios of highly ductile members in AISC 341-16.*
3. *The biaxial dual-strong axis and column minor axis configurations of the moment connection shall be considered as an alternative system.*
4. *For SMF and IMF systems, on the sideplate standard or configuration A the U-shaped cover plates shall be used with the k dimension extension. The k dimension extension length is defined as beam depth db/6, rounded to the nearest ½ inch.*
5. *The hinge-to-hinge span to beam depth, Lh/d, shall be greater than or equal to 4.5.*
6. *The width-to-thickness ratios for beam flanges shall not be less than 3.5. Exception: For width-to-thickness ratios less than 3.5 the Cpr shall be calculated in accordance with that for welded sideplate connections but in no case shall the width-to-thickness ratio be less than 3.0.*
7. *The minimum bolt-to-bolt spacing shall not be less than 3 bolt diameters.*
8. *The extension of the side plates beyond the face of the column shall be within the range of 0.65d to 1.5d.*
9. *The gap-to-side plate thickness ratio shall range from 2.1 to 2.3.*
10. *Demand Critical fillet welds {2}, {5}, {5a} and {8} 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.*
11. *The connection specific factor to account for peak connection strength, Cpr, shall be between 1.15 and 1.35. Calculations shall be submitted to OSHPD for review and approval.*
12. *For in-plane collectors transferring axial loads into the sideplate connection, coordination between sideplate and the Registered design professional in responsible charge will be required to confirm the collector connection is sufficient to transfer the load into the moment frame system. This requirement shall be satisfied by designing the sideplate connections in the first bay of a multi-bay sideplate moment frame or an end bay to have a minimum connection capacity, including combined shear (Vu + Vg) and moment (Mpr) demands, of at least 1.2 times the Mpr at the plastic hinge location when the axial load, as determined by ASCE 7 Section 12.10.2.1 without Ωo, exceeds 0.1 FyAg of the sideplate beam.*
13. *A complete frame analysis for gravity and design wind loading using LRFD load combinations in Section 1605.2 shall be performed including Demand/Capacity Ratios. Frame beam member nominal moment strengths (Mn) used for gravity and design wind loading for the bolted sideplate connection using Class A or Class B faying surfaces shall be taken as 0.80FyZ for frame beams up to 300 plf and 0.60FyZ for frame beams greater than 300 plf.*
14. *For moment frame beams with maximum beam shear greater than 90 percent of the vertical bolt shear capacity, a secondary check is to be provided to confirm the vertical bolt shear capacities are sufficient.*
15. *Bolted sideplate connections used on heavy-shallow frame beams for beams greater than 200 plf and shallower than 24 inches in depth shall be considered as an alternative system.*
16. *Skewed beams shall utilize the link-beam fabrication method with CJP welded splices for skew angles. The skew angle shall be less than 15 degrees.*
17. *For two-sided bolted sideplate connections sharing the same side plates at the same height and depth across the column, the vertical offset in the beams shall not exceed 10 inches.*

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**CHAPTER 22*A***

**STEEL**

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**SECTION 2205*A* STRUCTURAL STEEL**

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***2205A.4 Modifications to AISC 341. [OSHPD 1 and 4]***

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***2205A.4.9 Section K2.*** *Replace Section K2.3b as follows:*

*The size of the beam or ~~l~~ink used in the Test Specimen shall be within the following limits:*

1. *~~At least one of t~~The test beams or links shall be no less than 100% of the depth of the prototype beam or link. ~~For the remaining specimens, the depth of the test beam or Link shall be no less than 90 percent of the depth of the prototype beam or link.~~*
2. *~~At least one of t~~The test beams or links shall be no less than 100% of the weight per foot of the prototype beam or link. ~~For the remaining specimens, the weight per foot of the test beam or link shall be no less than 75 percent of the weight per foot of the prototype beam or link.~~*

*The size of the column used in the test specimen shall properly represent the inelastic action in the column, as per the requirements in Section K2.3a. In addition, the depth of the test column shall be no less than 90% of the depth of the prototype column.*

*Extrapolation beyond the limitations stated in this section shall be permitted subject to peer review and approval by the enforcement agency.*

*…*

***2205A.5 Modifications to AISC 358. [OSHPD 1 & 4]***

***2205A.5.1*** *Design Requirements, 2.1 Special and Intermediate Moment Frame Connection Types, Table 2-1 Prequalified Moment Connections modifications.*

*The prequalified bolted moment connections are not permitted in buildings.*

***Exceptions:***

1. *Erection bolts are permitted.*
2. *The approved* *bolted moment connection in accordance with AISC 358 Chapter 10 as permitted by the exception to Section 2206A.2 and AISC 358-16 Supplement No. 1, Chapter 11.*

***2205A.5.2 Moment Connection - Chapter 11.*** *The welded sideplate steel moment connection shall be permitted provided:*

1. *The beams shall consist of either rolled or built-up wide flange sections.*
2. *The biaxial dual-strong axis and column minor axis configurations of the moment connection shall be considered as an alternative system.*
3. *For SMF and IMF systems, U-shaped cover plates shall be used and the hinge-to-hinge span to beam depth, Lh/d, shall be greater than or equal to 5.*
4. *The width-to-thickness ratios for beam flanges shall not be less than 3.*
5. *The spacing for lateral bracing of wide flange beams, Lb, shall include the length of the side plate at beam ends.*
6. *The extension of the side plates beyond the face of the column shall be within the range of 0.77d to 1.0d.*
7. *The gap-to-side plate thickness ratio shall range from 2.1 to 2.3.*
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.*

***2205A.5.3 Bolted Moment Connection - Chapter 11, Supplement No. 1.*** *The bolted sideplate steel moment connection in accordance with AISC 358-16 Supplement No. 1 shall be permitted provided:*

1. *A linear analysis procedure shall be used for design of the SMF and IMF systems using the bolted sideplate connection when permitted in accordance with ASCE 7. Nonlinear procedures will be considered as an alternative system.*
2. *The beams shall consist of either rolled or built-up wide flange sections. Columns shall consist of rolled or built-up wide flange sections or non-composite built-up box or HSS with a minimum wall thickness of 3/4 inch, or satisfy the requirements of width-to-thickness ratios of highly ductile members in AISC 341-16.*
3. *The biaxial dual-strong axis and column minor axis configurations of the moment connection shall be considered as an alternative system.*
4. *For SMF and IMF systems, on the sideplate standard or configuration A the U-shaped cover plates shall be used with the k dimension extension. The k dimension extension length is defined as beam depth db/6, rounded to the nearest ½ inch.*
5. *The hinge-to-hinge span to beam depth, Lh/d, shall be greater than or equal to 4.5.*
6. *The width-to-thickness ratios for beam flanges shall not be less than 3.5. Exception: For width-to-thickness ratios less than 3.5 the Cpr shall be calculated in accordance with that for welded sideplate connections but in no case shall the width-to-thickness ratio be less than 3.0.*
7. *The minimum bolt-to-bolt spacing shall not be less than 3 bolt diameters.*
8. *The extension of the side plates beyond the face of the column shall be within the range of 0.65d to 1.5d.*
9. *The gap-to-side plate thickness ratio shall range from 2.1 to 2.3.*
10. *Demand Critical fillet welds {2}, {5}, {5a} and {8} 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.*
11. *The connection specific factor to account for peak connection strength, Cpr, shall be between 1.15 and 1.35. Calculations shall be submitted to OSHPD for review and approval.*
12. *For in-plane collectors transferring axial loads into the sideplate connection, coordination between sideplate and the Registered design professional in responsible charge will be required to confirm the collector connection is sufficient to transfer the load into the moment frame system. This requirement shall be satisfied by designing the sideplate connections in the first bay of a multi-bay sideplate moment frame or an end bay to have a minimum connection capacity, including combined shear (Vu + Vg) and moment (Mpr) demands, of at least 1.2 times the Mpr at the plastic hinge location when the axial load, as determined by ASCE 7 Section 12.10.2.1 without Ωo, exceeds 0.1 FyAg of the sideplate beam.*
13. *A complete frame analysis for gravity and design wind loading using LRFD load combinations in Section 1605A.2 shall be performed including Demand/Capacity Ratios. Frame beam member nominal moment strengths (Mn) used for gravity and design wind loading for the bolted sideplate connection using Class A or Class B faying surfaces shall be taken as 0.80FyZ for frame beams up to 300 plf and 0.60FyZ for frame beams greater than 300 plf.*
14. *For moment frame beams with maximum beam shear greater than 90 percent of the vertical bolt shear capacity, a secondary check is to be provided to confirm the vertical bolt shear capacities are sufficient.*
15. *Bolted sideplate connections used on heavy-shallow frame beams for beams greater than 200 plf and shallower than 24 inches in depth shall be considered as an alternative system.*
16. *Skewed beams shall utilize the link-beam fabrication method with CJP welded splices for skew angles. The skew angle shall be less than 15 degrees.*
17. *For two-sided bolted sideplate connections sharing the same side plates at the same height and depth across the column, the vertical offset in the beams shall not exceed 10 inches.*

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**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850

# Item: 9

**Chapter: APPENDIX L EARTHQUAKE RECORDING INSTRUMENTATION**

**Section:** **SECTION L101 GENERAL, 1.101.3 Maintenance.**

**Express Terms:**

**APPENDIX L**

**EARTHQUAKE RECORDING INSTRUMENTATION**

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**SECTION L101 GENERAL**

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**1.101.3 Maintenance.** Maintenance and service of the instrumentation shall be provided by the owner of the structure. Data produced by the instrument shall be made available to the building official on request.

Maintenance and service of the instruments shall be performed annually by an approved testing agency. The owner shall file with the building official a written report from an approved testing agency certifying that each instrument has been serviced and is in proper working condition. This report shall be submitted when the instruments are installed and annually thereafter. Each instrument shall have affixed to it an externally visible tag specifying the date of the last maintenance or service and the printed name and address of the testing agency.

***[OSHPD 1]*** *~~The owner of the building shall be responsible for the implementation of the instrumentation program. Maintenance of the instrumentation and removal/processing~~ Data retrieval from the instrument and processing of the records shall be the responsibility of the enforcement agency.*

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**Notation:**

Authority: Health and Safety Code, Sections 1275, 18928, 129790, and 129850

Reference: Health and Safety Code, Section 129850