

REVISION RECORD FOR THE STATE OF CALIFORNIA

EMERGENCY SUPPLEMENT

January 1, 2008

2007 Title 24, Part 2, California Building Code

**PLEASE NOTE: The date of this errata is for identification purposes only.
See the History Note Appendix for the adoption and effective dates of the provisions.**

It is suggested that the section number as well as the page number be checked when inserting this material and removing the superseded material. In case of doubt, rely on the section numbers rather than the page numbers because the section numbers must run consecutively.

It is further suggested that the material be retained with this revision record sheet so that the prior wording of any section can be easily ascertained.

Please keep the removed pages with this revision page for future reference.

Note

Due to the fact that the application date for a building permit establishes the California Building Standards Code provisions that are effective at the local level, which apply to the plans, specifications, and construction for that permit, it is strongly recommended that the removed pages be retained for historical reference.

Volume 2

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1607A.5 Partition loads. In office buildings and in other buildings where partition locations are subject to change, provisions for partition weight shall be made, whether or not partitions are shown on the construction documents, unless the specified live load exceeds 80 psf (3.83 kN/m²). The partition load shall not be less than a uniformly distributed live load of 15 psf (0.74 kN/m²).

1607A.6 Truck and bus garages. Minimum live loads for garages having trucks or buses shall be as specified in Table 1607A.6, but shall not be less than 50 psf (2.40 kN/m²), unless other loads are specifically justified and approved by the building official. Actual loads shall be used where they are greater than the loads specified in the table.

**TABLE 1607A.6
UNIFORM AND CONCENTRATED LOADS**

LOADING CLASS ^a	UNIFORM LOAD (pounds/linear foot of lane)	CONCENTRATED LOAD (pounds) ^b	
		For moment design	For shear design
H20-44 and HS20-44	640	18,000	26,000
H15-44 and HS15-44	480	13,500	19,500

For SI: 1 pound per linear foot = 0.01459 kN/m, 1 pound = 0.004448 kN, 1 ton = 8.90 kN.

- a. An H loading class designates a two-axle truck with a semitrailer. An HS loading class designates a tractor truck with a semitrailer. The numbers following the letter classification indicate the gross weight in tons of the standard truck and the year the loadings were instituted.
- b. See Section 1607A.6.1 for the loading of multiple spans.

1607A.6.1 Truck and bus garage live load application.

The concentrated load and uniform load shall be uniformly distributed over a 10-foot (3048 mm) width on a line normal to the centerline of the lane placed within a 12-foot-wide (3658 mm) lane. The loads shall be placed within their individual lanes so as to produce the maximum stress in each structural member. Single spans shall be designed for the uniform load in Table 1607A.6 and one simultaneous concentrated load positioned to produce the maximum effect. Multiple spans shall be designed for the uniform load in Table 1607A.6 on the spans and two simultaneous concentrated loads in two spans positioned to produce the maximum negative moment effect. Multiple span design loads, for other effects, shall be the same as for single spans.

1607A.7 Loads on handrails, guards, grab bars, shower seats, dressing room bench seats, and vehicle barriers.

Handrails, guards, grab bars and vehicle barriers shall be designed and constructed to the structural loading conditions set forth in this section.

1607A.7.1 Handrails and guards. Handrail assemblies and guards shall be designed to resist a load of 50 plf (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure. Glass handrail assemblies and guards shall also comply with Section 2407.

Exceptions:

- 1. For one- and two-family dwellings, only the single concentrated load required by Section 1607A.7.1.1 shall be applied.

- 2. In Group I-3, F, H and S occupancies, for areas that are not accessible to the general public and that have an occupant load less than 50, the minimum load shall be 20 pounds per foot (0.29 kN/m).

1607A.7.1.1 Concentrated load. Handrail assemblies and guards shall be able to resist a single concentrated load of 200 pounds (0.89 kN), applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate structural elements of the building. This load need not be assumed to act concurrently with the loads specified in the preceding paragraph.

1607A.7.1.2 Components. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds (0.22 kN) on an area equal to 1 square foot (0.093 m²), including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of Section 1607A.7.1 or 1607A.7.1.1.

1607A.7.2 Grab bars, shower seats and dressing room bench seats.

Grab bars, shower seats and dressing room bench seat systems shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point. [DSA-AC] See Chapter 11A, Section 1127A.4, and Chapter 11B, Sections 1115B.7.2 and 1117B.8, for grab bars, shower seats and dressing room bench seats, as applicable.

1607A.7.3 Vehicle barriers.

Vehicle barrier systems for passenger cars shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, the load shall be assumed to act at a minimum height of 1 foot, 6 inches (457 mm) above the floor or ramp surface on an area not to exceed 1 square foot (305 mm²), and is not required to be assumed to act concurrently with any handrail or guard loadings specified in the preceding paragraphs of Section 1607A.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

1607A.8 Impact loads. The live loads specified in Section 1607A.3 include allowance for impact conditions. Provisions shall be made in the structural design for uses and loads that involve unusual vibration and impact forces.

1607A.8.1 Elevators. Elevator loads shall be increased by 100 percent for impact and the structural supports shall be designed within the limits of deflection prescribed by ASME A17.1.

1607A.8.2 Machinery. For the purpose of design, the weight of machinery and moving loads shall be increased as follows to allow for impact: (1) elevator machinery, 100 percent; (2) light machinery, shaft- or motor-driven, 20 percent; (3) reciprocating machinery or power-driven units, 50 percent; (4) hangers for floors or balconies, 33 percent. Per-

centages shall be increased where specified by the manufacturer.

1607A.9 Reduction in live loads. Except for roof uniform live loads, all other minimum uniformly distributed live loads, L_o , in Table 1607A.1 are permitted to be reduced in accordance with Section 1607A.9.1 or 1607A.9.2.

1607A.9.1 General. Subject to the limitations of Sections 1607A.9.1.1 through 1607A.9.1.4, members for which a value of $K_{LL}A_T$ is 400 square feet (37.16 m²) or more are permitted to be designed for a reduced live load in accordance with the following equation:

$$L = L_o \left(0.25 + \frac{15}{\sqrt{K_{LL} A_T}} \right) \quad \text{(Equation 16A-24)}$$

$$\text{For SI: } L = L_o \left(0.25 + \frac{4.57}{\sqrt{K_{LL} A_T}} \right)$$

where:

L = Reduced design live load per square foot (meter) of area supported by the member.

L_o = Unreduced design live load per square foot (meter) of area supported by the member (see Table 1607A.1).

K_{LL} = Live load element factor (see Table 1607A.9.1).

A_T = Tributary area, in square feet (square meters). L shall not be less than 0.50 L_o for members supporting one floor and L shall not be less than 0.40 L_o for members supporting two or more floors.

**TABLE 1607A.9.1
LIVE LOAD ELEMENT FACTOR, K_{LL}**

ELEMENT	K_{LL}
Interior columns	4
Exterior columns without cantilever slabs	4
Edge columns with cantilever slabs	3
Corner columns with cantilever slabs	2
Edge beams without cantilever slabs	2
Interior beams	2
All other members not identified above including: Edge beams with cantilever slabs Cantilever beams Two-way slabs Members without provisions for continuous shear transfer normal to their span	1

1607A.9.1.1 Heavy live loads. Live loads that exceed 100 psf (4.79 kN/m²) shall not be reduced.

Exceptions:

1. The live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than L as calculated in Section 1607A.9.1.

2. For uses other than storage, where approved, additional live load reductions shall be permitted where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.

1607A.9.1.2 Passenger vehicle garages. The live loads shall not be reduced in passenger vehicle garages except the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than L as calculated in Section 1607A.9.1.

1607A.9.1.3 Special occupancies. Live loads of 100 psf (4.79 kN/m²) or less shall not be reduced in public assembly occupancies.

1607A.9.1.4 Special structural elements. Live loads shall not be reduced for one-way slabs except as permitted in Section 1607A.9.1.1. Live loads of 100 psf (4.79 kN/m²) or less shall not be reduced for roof members except as specified in Section 1607A.11.2.

1607A.9.2 Alternate floor live load reduction. As an alternative to Section 1607A.9.1, floor live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

1. A reduction shall not be permitted in Group A occupancies.
2. A reduction shall not be permitted where the live load exceeds 100 psf (4.79 kN/m²) except that the design live load for members supporting two or more floors is permitted to be reduced by 20 percent.
3. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.
4. For live loads not exceeding 100 psf (4.79 kN/m²), the design live load for any structural member supporting 150 square feet (13.94 m²) or more is permitted to be reduced in accordance with the following equation:

$$R = 0.08 (A - 150) \quad \text{(Equation 16A-25)}$$

$$\text{For SI: } R = 0.861 (A - 13.94)$$

Such reduction shall not exceed the smallest of:

1. 40 percent for horizontal members;
2. 60 percent for vertical members; or
3. R as determined by the following equation.

$$R = 23.1 (1 + D/L_o) \quad \text{(Equation 16A-26)}$$

where:

A = Area of floor supported by the member, square feet (m²).

D = Dead load per square foot (m²) of area supported.

2. Where the exception to Section 20.3.1 is applicable except for base isolated buildings.
2. A ground motion hazard analysis shall be performed in accordance with Section 21.2 when:
- A time history response analysis of the building is performed as part of the design.
 - The building site is located within 10 kilometers of an active fault.
 - For seismically isolated structures and for structures with damping systems.

1614A.1.3 ASCE 7, Table 12.2-1. Modify ASCE 7 Table 12.2-1 as follows:

A. BEARING WALL SYSTEMS

2. Steel eccentrically braced frames, non-moment-resisting connections at columns away from links—Not permitted OSHPD.
14. Light-framed walls with shear panels of all other materials—Not permitted by OSHPD and DSA-SS.

B. BUILDING FRAME SYSTEMS

4. Ordinary steel concentrically braced frames—Not permitted by OSHPD.
24. Light-framed walls with shear panels of all other materials—Not permitted by OSHPD and DSA-SS.
25. Buckling-restrained braced frames, nonmoment-resisting beam-column connections—Not permitted by OSHPD.
27. Special steel plate shear wall—Not permitted by OSHPD.

C. MOMENT-RESISTING FRAME SYSTEMS

2. Special steel truss moment frames—Not permitted by OSHPD.
3. Intermediate steel moment frames—Not permitted by OSHPD.
4. Ordinary steel moment frames—Not permitted by OSHPD.

Exceptions:

- Systems listed in this section can be used as an alternative system when preapproved by the enforcement agency.
- Roof-top or other supported structures not exceeding two stories in height and 10 percent of the total structure weight can use the systems in this section when designed as components per ASCE 7 Chapter 13.
- Systems listed in this section can be used for seismically isolated buildings when permitted by Section 1613A.6.2.

1614A.1.4 ASCE 7, Section 12.2.3.1. Modify ASCE 7 Section 12.2.3.1 by adding the following additional requirements for two stage equivalent lateral force procedure:

- Where design of elements of the upper portion is governed by special seismic load combinations, the special loads shall be considered in the design of lower portions.
- The detailing requirements required for the lateral system of the upper portion shall be used for structural components common to the structural system of the lower portion.
- If separate models are used to design the upper and lower portions, the model boundary conditions of the upper portion shall be compatible with actual strength and stiffness of the supporting elements of the lower portion.
- Both flexible upper portion and rigid lower portion considered separately can be classified as being regular.

Exception: When dynamic analysis is used, regularity requirements in Item h above need not apply.

1614A.1.5 ASCE 7, Section 12.3.3. Modify first sentence of ASCE 7 Section 12.3.3.1 as follows:

12.3.3.1 Prohibited horizontal and vertical irregularities for Seismic Design Categories D through F. Structures assigned to Seismic Design Category D, E or F having horizontal structural irregularity Type 1b of Table 12.3-1 or vertical structural irregularities Type 1b, 5a or 5b of Table 12.3-2 shall not be permitted.

1614A.1.6 ASCE 7, Section 12.7.2. Modify ASCE 7 Section 12.7.2 by adding Item 5 to read as follows:

- Where buildings provide lateral support for walls retaining earth, and the exterior grades on opposite sides of the building differ by more than 6 feet (1829 mm), the load combination of the seismic increment of earth pressure due to earthquake acting on the higher side, as determined by a geotechnical engineer qualified in soils engineering plus the difference in earth pressures shall be added to the lateral forces provided in this section.

1614A.1.7 ASCE 7, Section 12.8.1.1. Modify ASCE 7 Section 12.8.1.1 by replacing Equation 12.8-5 as follows:

$$C_s = 0.03 \quad (12.8-5)$$

1614A.1.8 ASCE 7, Section 12.8.7. Modify ASCE 7 Section 12.8.7 by replacing Equation 12.8-16 as follows:

$$\theta = \frac{P_x \Delta I}{V_x h_{sx} C_d} \quad (12.8-16)$$

1614A.1.9 ASCE 7, Section 12.9.4. Replace ASCE 7 Section 12.9.4 as follows:

12.9.4 Scaling design values of combined response. Modal base shear shall not be less than the base shear calculated using the equivalent lateral force procedure of Section 12.8.

1614A.1.10 ASCE 7, Section 12.13.1. Modify ASCE 7 Section 12.13.1 by adding Section 12.13.1.1 as follows:

12.13.1.1 Foundations and superstructure-to-foundation connections. The foundation shall be capable of

transmitting the design base shear and the overturning forces from the structure into the supporting soil.

In addition, the foundation and the connection of the superstructure elements to the foundation shall have the strength to resist, in addition to gravity loads, the lesser of the following seismic loads:

1. The strength of the superstructure elements.
2. The maximum forces that would occur in the fully yielded structural system.
3. Forces from load combinations with overstrength factor per ASCE 7 Section 12.4.3.2.

Exceptions:

1. Where structures are designed using $R \leq 2.5$ such as for inverted pendulum-type structures.
2. When it can be demonstrated that inelastic deformation of the foundation and superstructure-to-foundation connection will not result in a weak story or cause collapse of the structure.
3. Where the basic structural system consists of light-framed walls with shear panels.

Where the computation of the seismic overturning moment is by the equivalent lateral-force method or the modal analysis method, reduction in overturning moment permitted by Section 12.13.4 of ASCE 7 may be used.

Where moment resistance is assumed at the base of the superstructure elements, the rotation and flexural deformation of the foundation as well as deformation of the superstructure-to-foundation connection shall be considered in the drift and deformation compatibility analyses.

Exception: The seismic loads defined above need not be considered for friction and passive resistance. Ultimate soil pressure can be used when considering load combinations with the seismic loads defined above.

1614A.1.11 ASCE 7, Section 13.3.2. Modify ASCE 7 Section 13.3.2 by adding the following:

The seismic relative displacements to be used in design of displacement sensitive nonstructural components is $D_p I$ instead of D_p , where D_p is given by Equations 13.3-5 to 13.3-8 and I is the building importance factor given in Section 11.5.

1614A.1.12 ASCE 7, Section 13.5.6.2. Modify ASCE 7 Section 13.5.6.2 by adding Section 13.5.6.2.3 as follows:

13.5.6.2.3 Additional requirements.

1. **Exitways.** Lay-in ceiling assemblies in exitways of hospitals and essential services buildings shall be installed with a main runner or cross runner surrounding all sides of each piece of tile, board or panel and each light fixture or grille. A cross

runner that supports another cross runner shall be considered as a main runner for the purpose of structural classification. Splices or intersections of such runners shall be attached with through connectors such as pop rivets, screws, pins, plates with end tabs or other approved connectors.

2. **Corridors and lobbies.** Expansion joints shall be provided in the ceiling at intersections of corridors and at junctions of corridors and lobbies or other similar areas.
3. **Lay-in panels.** Metal panels and panels weighing more than $1/2$ pound per square foot (24 N/m^2) other than acoustical tiles shall be positively attached to the ceiling suspension runners.
4. **Grid members, connectors and expansion devices.** The allowable load-carrying capacity as determined by test shall not exceed one-third of the mean ultimate test value based on tests of no fewer than three identical specimens. Rational analysis can be substituted for test where permitted by ASCE 7 and the enforcement agency.
5. **Vertical hangers.** Each vertical hanger shall be attached to the ceiling suspension member and to the support above with a minimum of three tight twists in $1\frac{1}{2}$ inches (38 mm).
- 6a. **[OSHPD 1 & 4] Lateral-force bracing.** Substantiating design calculations or test reports shall be provided for all lateral-force bracing, their connections and anchorages. Lateral forces must comply with the seismic force requirements of ASCE 7 Chapter 13. Horizontal restraint points shall not be placed more than 8 feet by 12 feet (2438 mm by 3658 mm) on center. Horizontal restraint wires shall be No. 12 gage minimum and secured to main runners with four tight twists in $1\frac{1}{2}$ inches (38 mm).
- 6b. **[DSA-SS] Lateral-force bracing.** Substantiating design calculations or test reports shall be provided for all lateral-force bracing, their connections and anchorages. Lateral forces must comply with the seismic force requirements of ASCE 7 Chapter 13. Horizontal restraint points shall not be placed more than 12 feet by 12 feet (3658 mm by 3658 mm) on center. Horizontal restraint wires shall be No. 12 gage minimum and secured to main runners with four tight twists in $1\frac{1}{2}$ inches.
7. **Ceiling fixtures.** Fixtures installed in acoustical tile or lay-in panel ceilings shall be mounted in a manner that will not compromise ceiling performance.

All recessed or drop-in light fixtures and grilles shall be supported directly from the fixture housing to the structure above with a minimum of two 12-gage wires located at diagonally opposite corners. Leveling and positioning of fix-

**TABLE 1704A.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	CBC REFERENCE
1. Material verification of high-strength bolts, nuts and washers:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material specifications; AISC 360, Section A3.3	—
b. Manufacturer’s certificate of compliance required.	—	X	—	—
2. Inspection of high-strength bolting:				
a. Bearing-type connections.	—	X	AISC 360, Section M2.5	1704A.3.3
b. Slip-critical connections.	X	X		
3. Material verification of structural steel:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	—	ASTM A 6 or ASTM A 568	1708A.4
b. Manufacturers’ certified mill test reports.	—	—	ASTM A 6 or ASTM A 568	
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.	—	—	AISC 360, Section A3.5	—
b. Manufacturer’s certificate of compliance required.	—	—	—	—
5. Inspection of welding:				
a. Structural steel:	—	—		
1) Complete and partial penetration groove welds.	X	—	AWS D1.1	1704A.3.1
2) Multipass fillet welds.	X	—		
3) Single-pass fillet welds $> 5/16$ "	X	—		
4) Single-pass fillet welds $\leq 5/16$ "	—	X		
5) Floor and roof deck welds.	—	X	AWS D1.3	—
b. Reinforcing steel:	—	—		
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 ACI 318: 3.5.2	—
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	X	—		
3) Shear reinforcement.	X	—		
4) Other reinforcing steel.	—	X		
6. Inspection of steel frame joint details for compliance with approved construction documents:		X		
a. Details such as bracing and stiffening.	—	—	—	1704A.3.2
b. Member locations.	—	—		
c. Application of joint details at each connection.	—	—		

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707A.1, Special inspection for seismic resistance.

1704A.3.3 High-strength bolts. Installation of high-strength bolts shall be periodically inspected in accordance with AISC specifications.

1704A.3.3.1 General. While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts, washers and paint; bolted parts and installation and tightening in such standards are met. For bolts requiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the snug-tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged.

1704A.3.3.2 Periodic monitoring. Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut

method with matchmarking techniques, the direct tension indicator method or the alternate design fastener (twist-off bolt) method. Joints designated as snug tight need be inspected only on a periodic basis.

1704A.3.3.3 Continuous monitoring. Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.

1704A.4 Concrete construction. The special inspections and verifications for concrete construction shall be as required by this section and Table 1704A.4.

1704A.4.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 3.5.2 of ACI 318.

**TABLE 1704A.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	CBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1-7.7	1913A.4
2. Inspection of reinforcing steel welding in accordance with Table 1704A.3, Item 5b.	—	—	AWS D1.4 ACI 318: 3.5.2	—
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased or design is based on Section 1912A.	X	—	ACI 318: Appendix D	1911A.5, 1912A
4. Verifying use of required design mix.	—	X	ACI 318: Ch. 4, 5.2-5.4	1904A.2.2, 1913A.2, 1913A.3
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1913A.10
6. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1913A.6, 1913A.7, 1913A.8
7. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11-5.13	1913A.9
8. Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	X X	—	ACI 318: 18.20 ACI 318: 18.18.4	—
9. Erection of precast concrete members.	—	X	ACI 318: Ch. 16	—
10. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	—
11. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 6.1.1	—
12. Post-installed anchors.	X	—	—	—

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707A.1, Special inspection for seismic resistance.

ment determines that the load-bearing capacity is less than that required by the code, load tests shall be conducted in accordance with Section 1713A.2. If the building, structure or portion thereof is found to have inadequate stability or load-bearing capacity for the expected loads, modifications to ensure structural adequacy or the removal of the inadequate construction shall be required.

1713A.2 Test standards. Structural components and assemblies shall be tested in accordance with the appropriate material standards listed in Chapter 35. In the absence of a standard that contains an applicable load test procedure, the test procedure shall be developed by a registered design professional and approved. The test procedure shall simulate loads and conditions of application that the completed structure or portion thereof will be subjected to in normal use.

1713A.3 In-situ load tests. In-situ load tests shall be conducted in accordance with Section 1713A.3.1 or 1713A.3.2 and shall be supervised by a registered design professional. The test shall simulate the applicable loading conditions specified in Chapter 16A as necessary to address the concerns regarding structural stability of the building, structure or portion thereof.

1713A.3.1 Load test procedure specified. Where a standard listed in Chapter 35 contains an applicable load test procedure and acceptance criteria, the test procedure and acceptance criteria in the standard shall apply. In the absence of specific load factors or acceptance criteria, the load factors and acceptance criteria in Section 1713A.3.2 shall apply.

1713A.3.2 Load test procedure not specified. In the absence of applicable load test procedures contained within a standard referenced by this code or acceptance criteria for a specific material or method of construction, such existing structure shall be subjected to a test procedure developed by a registered design professional that simulates applicable loading and deformation conditions. For components that are not a part of the seismic-load-resisting system, the test load shall be equal to two times the unfactored design loads. The test load shall be left in place for a period of 24 hours. The structure shall be considered to have successfully met the test requirements where the following criteria are satisfied:

1. Under the design load, the deflection shall not exceed the limitations specified in Section 1604A.3.
2. Within 24 hours after removal of the test load, the structure shall have recovered not less than 75 percent of the maximum deflection.
3. During and immediately after the test, the structure shall not show evidence of failure.

SECTION 1714A PRECONSTRUCTION LOAD TESTS

1714A.1 General. In evaluating the physical properties of materials and methods of construction that are not capable of being designed by approved engineering analysis or do not comply with applicable material design standards listed in Chapter 35, the structural adequacy shall be predetermined based on the load test criteria established in this section.

1714A.2 Load test procedures specified. Where specific load test procedures, load factors and acceptance criteria are included in the applicable design standards listed in Chapter 35, such test procedures, load factors and acceptance criteria shall apply. In the absence of specific test procedures, load factors or acceptance criteria, the corresponding provisions in Section 1714A.3 shall apply.

1714A.3 Load test procedures not specified. Where load test procedures are not specified in the applicable design standards listed in Chapter 35, the load-bearing and deformation capacity of structural components and assemblies shall be determined on the basis of a test procedure developed by a registered design professional that simulates applicable loading and deformation conditions. For components and assemblies that are not a part of the seismic-load-resisting system, the test shall be as specified in Section 1714A.3.1. Load tests shall simulate the applicable loading conditions specified in Chapter 16A.

1714A.3.1 Test procedure. The test assembly shall be subjected to an increasing superimposed load equal to not less than two times the superimposed design load. The test load shall be left in place for a period of 24 hours. The tested assembly shall be considered to have successfully met the test requirements if the assembly recovers not less than 75 percent of the maximum deflection within 24 hours after the removal of the test load. The test assembly shall then be reloaded and subjected to an increasing superimposed load until either structural failure occurs or the superimposed load is equal to two and one-half times the load at which the deflection limitations specified in Section 1714A.3.2 were reached, or the load is equal to two and one-half times the superimposed design load. In the case of structural components and assemblies for which deflection limitations are not specified in Section 1714A.3.2, the test specimen shall be subjected to an increasing superimposed load until structural failure occurs or the load is equal to two and one-half times the desired superimposed design load. The allowable superimposed design load shall be taken as the lesser of:

1. The load at the deflection limitation given in Section 1714A.3.2.
2. The failure load divided by 2.5.
3. The maximum load applied divided by 2.5.

1714A.3.2 Deflection. The deflection of structural members under the design load shall not exceed the limitations in Section 1604A.3.

1714A.4 Wall and partition assemblies. Load-bearing wall and partition assemblies shall sustain the test load both with and without window framing. The test load shall include all design load components. Wall and partition assemblies shall be tested both with and without door and window framing.

1714A.5 Exterior window and door assemblies. The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section 1714A.5.1 or 1714A.5.2.

Exception: Structural wind load design pressures for window units smaller than the size tested in accordance with Section 1714A.5.1 or 1714A.5.2 shall be permitted to be higher than the design value of the tested unit provided such

higher pressures are determined by accepted engineering analysis. All components of the small unit shall be the same as the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window unit having the highest allowable design pressure.

1714A.5.1 Exterior windows and doors. Exterior windows and sliding doors shall be tested and labeled as conforming to AAMA/WDMA/CSA101/I.S.2/A440. The label shall state the name of the manufacturer, the approved labeling agency and the product designation as specified in AAMA/WDMA/CSA101/I.S.2/A440. Exterior side-hinged doors shall be tested and labeled as conforming to AAMA/WDMA/CSA101/I.S.2/A440 or comply with Section 1714A.5.2. Products tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 shall not be subject to the requirements of Sections 2403.2 and 2403.3.

1714A.5.2 Exterior windows and door assemblies not provided for in Section 1714A.5.1. Exterior window and door assemblies shall be tested in accordance with ASTM E 330. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with Chapter 16A. Each assembly shall be tested for 10 seconds at a load equal to 1.5 times the design pressure.

1714A.6 Test specimens. Test specimens and construction shall be representative of the materials, workmanship and details normally used in practice. The properties of the materials used to construct the test assembly shall be determined on the basis of tests on samples taken from the load assembly or on representative samples of the materials used to construct the load test assembly. Required tests shall be conducted or witnessed by an approved agency.

SECTION 1715A MATERIAL AND TEST STANDARDS

1715A.1 Test standards for joist hangers and connectors.

1715A.1.1 Test standards for joist hangers. The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.

Exception: The joist length shall not be required to exceed 24 inches (610 mm).

1715A.1.2 Vertical load capacity for joist hangers. The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are

conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).

2. The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).
3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 0.125 inch (3.2 mm).
4. The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.
5. The allowable design load for the wood members forming the connection.

1715A.1.3 Torsional moment capacity for joist hangers. The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 0.125 inch (3.2 mm).

1715A.1.4 Design value modifications for joist hangers. Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1715A.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1715A.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1715A.1.2 shall not be modified by duration of loading factors.

1715A.2 Concrete and clay roof tiles.

1715A.2.1 Overturning resistance. Concrete and clay roof tiles shall be tested to determine their resistance to overturning due to wind in accordance with SBCCI SSTD 11 and Chapter 15.

1715A.2.2 Wind tunnel testing. When roof tiles do not satisfy the limitations in Chapter 16A for rigid tile, a wind tunnel test shall be used to determine the wind characteristics of the concrete or clay tile roof covering in accordance with SBCCI SSTD 11 and Chapter 15.

1811A.5 Seismic reinforcement. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613A, the following shall apply. Where concrete and steel are used as part of the pile assembly, the concrete reinforcement shall comply with that given in Sections 1810A.1.2.1 and 1810A.1.2.2 or the steel section shall comply with Section 1810A.6.4.1.

SECTION 1812A PIER FOUNDATIONS

1812A.1 General. Isolated and multiple piers used as foundations shall conform to the requirements of Sections 1812A.2 through 1812A.10, as well as the applicable provisions of Section 1808A.2.

1812A.2 Lateral dimensions and height. The minimum dimension of isolated piers used as foundations shall be 2 feet (610 mm), and the height shall not exceed 12 times the least horizontal dimension.

1812A.3 Materials. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pier, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.

1812A.4 Reinforcement. Except for steel dowels embedded 5 feet (1524 mm) or less in the pier, reinforcement where required shall be assembled and tied together and shall be placed in the pier hole as a unit before the reinforced portion of the pier is filled with concrete.

Exception: Reinforcement is permitted to be wet set and the 2 $\frac{1}{2}$ -inch (64 mm) concrete cover requirement be reduced to 2 inches (51 mm) for Group R-3 and U occupancies not exceeding two stories of light-frame construction, provided the construction method can be demonstrated to the satisfaction of the building official.

Reinforcement shall conform to the requirements of Sections 1810A.1.2.1 and 1810A.1.2.2.

Exceptions:

1. Isolated piers supporting posts of Group R-3 and U occupancies not exceeding two stories of light-frame construction are permitted to be reinforced as required by rational analysis but not less than a minimum of one No. 4 bar, without ties or spirals, when detailed so the pier is not subject to lateral loads and the soil is determined to be of adequate stiffness.
2. Isolated piers supporting posts and bracing from decks and patios appurtenant to Group R-3 and U occupancies not exceeding two stories of light-frame construction are permitted to be reinforced as required by rational analysis but not less than one No. 4 bar, without ties or spirals, when the lateral load, E , to the top of the pier does not exceed 200 pounds (890 N) and the soil is determined to be of adequate stiffness.

3. Piers supporting the concrete foundation wall of Group R-3 and U occupancies not exceeding two stories of light-frame construction are permitted to be reinforced as required by rational analysis but not less than two No. 4 bars, without ties or spirals, when it can be shown the concrete pier will not rupture when designed for the maximum seismic load, E_m and the soil is determined to be of adequate stiffness.
4. Closed ties or spirals where required by Section 1810A.1.2.2 are permitted to be limited to the top 3 feet (914 mm) of the piers 10 feet (3048 mm) or less in depth supporting Group R-3 and U occupancies of Seismic Design Category D, not exceeding two stories of light-frame construction.

1812A.5 Concrete placement. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pier, the concrete shall not be chuted directly into the pier but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pier.

1812A.6 Belled bottoms. Where pier foundations are belled at the bottom, the edge thickness of the bell shall not be less than that required for the edge of footings. Where the sides of the bell slope at an angle less than 60 degrees (1 rad) from the horizontal, the effects of vertical shear shall be considered.

1812A.7 Masonry. Where the unsupported height of foundation piers exceeds six times the least dimension, the allowable working stress on piers of unit masonry shall be reduced in accordance with ACI 530/ASCE 5/TMS 402.

1812A.8 Concrete. Piers shall be constructed of reinforced concrete, and shall conform to the requirements for columns in ACI 318.

1812A.9 Steel shell. Where concrete piers are entirely encased with a circular steel shell, and the area of the shell steel is considered reinforcing steel, the steel shall be protected under the conditions specified in Section 1808A.2.17. Horizontal joints in the shell shall be spliced to comply with Section 1808A.2.7.

1812A.10 Dewatering. Where piers are carried to depths below water level, the piers shall be constructed by a method that will provide accurate preparation and inspection of the bottom, and the depositing or construction of sound concrete or other masonry in the dry.

SECTION 1813A PRESTRESSED ROCK AND SOIL FOUNDATION ANCHORS

1813A.1 General. The requirements of this section address the use of vertical rock and soil anchors in resisting seismic or wind overturning forces resulting in tension on shallow foundations.

1813A.2 Adoption. Except for the modifications as set forth in Sections 1813A.3 and 1813A.4, all Prestressed Rock and Soil Foundation Anchors shall be designed in accordance with PTI Recommendations for Prestressed Rock and Soil Anchors.

1813A.3 Geotechnical Requirements. *Geotechnical report for the Prestressed Rock & Soil Foundation Anchors shall address the following:*

1. *Minimum diameter and minimum spacing for the anchors including consideration of group effects.*
2. *Maximum unbonded length and minimum bonded length of the tendon.*
3. *Maximum recommended anchor tension capacity based upon the soil or rock strength / grout bond and anchor depth / spacing.*
4. *Allowable bond stress at the ground / grout interface and applicable factor of safety for ultimate bond stress.*
5. *Anchor axial tension stiffness recommendations at the anticipated anchor axial tension displacements, when required for structural analysis.*
6. *Minimum grout pressure for installation and post-grout pressure.*
7. *Class I Corrosion Protection is required for all permanent anchors. Geotechnical report shall specify the corrosion protection recommendations for temporary anchors.*
8. *Performance test shall be at a minimum of 1.6 times the design loads. There shall be a minimum of two preproduction test anchors. Preproduction test anchors shall be tested to ultimate load or 0.80 times the specified minimum tensile strength of the tendon. A Creep test is required for all prestressed anchors with greater than 10 kips of lock-off prestressing load.*
9. *Lock-off prestressing load requirements.*
10. *Acceptable Drilling methods.*
11. *Geotechnical observation and monitoring requirements.*

1813A.4 Structural Requirements.

1. *Tendons shall be thread-bar anchors conforming to ASTM A 722.*
2. *The anchors shall be placed vertical.*
3. *Design Loads shall be based upon the load combinations in Section 1605A.3.1 and shall not exceed 60 percent of the specified minimum tensile strength of the tendons.*
4. *Ultimate Load shall be based upon Section 1614A.1.10 and shall not exceed 80 percent of the specified minimum tensile strength of the tendons.*
5. *The anchor shall be designed to fail in grout bond to the soil or rock before pullout of the soil wedge by group effect.*
6. *Foundation design shall incorporate the affect of lock-off loads.*
7. *Design shall account for as-built locations of soil anchors considering all the acceptable construction tolerances.*
8. *Design shall account for both short and long term deformation.*

9. *Enforcement agency may require consideration of anchor deformation in evaluating deformation compatibility or building drift where it may be significant.*

2205A.4.1.5.1 AISC 341, Part I, Section 13, Members. Add a new section as follows:

AISC 341, 13.2f—Member Types

The use of rectangular HSS are not permitted for bracing members, unless filled solid with cement grout having a minimum compressive strength of 3000 psi (20.7 MPa) at 28 days. The effects of composite action in the filled composite brace shall be considered in the sectional properties of the system where it results in the more severe loading condition or detailing.

2205A.4.1.5.2 Part I, Section 13: Add Section 13.7 as follows.

13.7 Beam to Column Connections.

SCBF frames shall have moment-resisting beam-column connections that can resist a moment equal to the lesser of the available flexural strength of the beam or the column in the SCBF bays. The connection shall include CJP welds from the beam flanges to the column flange, or to a plate in the case of column weak axis connections.

2205A.4.1.6 Part I, Section 14, Ordinary Concentrically Braced Frames (OCBF). Not permitted by OSHPD.

2205A.4.1.7 Part I, Section 15, Eccentrically Braced Frames (EBF) Modifications.

Part I, 15.4 Link-to-Column Connections.

Exception: Not permitted by OSHPD.

2205A.4.2 Appendix S, Qualifying Cyclic Tests of Beam-to-Column and Link-to-Column Connections Modifications.

2205A.4.2.1 Appendix S, S3, Definitions. Replace the definition of “Inelastic rotation” with the following:

INELASTIC ROTATION. *The permanent or plastic portion of the rotation angle between a beam and the column, or between a link and the column of the test specimen, measured in radians. The inelastic rotation shall be computed based upon an analysis of the test specimen deformations. Sources of inelastic rotation include yielding of members and connectors, yielding of connection elements and slip between members and connection elements. For beam-to-column moment connections in special moment frames, the inelastic rotation is represented by the plastic chord rotation angle calculated as the plastic deflection of the beam or girder, at the center of its span divided by the distance between the center of the beam span and the centerline of the panel zone of the beam-column connection. For link-to-column connections in eccentrically braced frames, inelastic rotation shall be computed based upon the assumption that inelastic action is concentrated at a single point located at the intersection of the centerline of the link with the face of the column.*

2205A.4.2.2 Appendix S, S3, Definitions. Add the following:

RAPID STRENGTH DETERIORATION. *A mode of behavior characterized by a sudden loss of strength. In a cyclic test with constant or increasing deformation amplitude, a loss of strength of more than 50 percent of the strength attained in the previous excursion in the same loading direction.*

2205A.4.2.3 Appendix S, Section S5.2, Size of Members. Replace as follows:

The size of the beam or link used in the test specimen shall be within the following limits:

- 1. At least one of the test beams or links shall be no less than 100 percent 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 the test beams or links shall be no less than 100 percent 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 S5.1. In addition, the depth of the test column shall be no less than 90 percent 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.4.2.4 Appendix S, Section S10, Acceptance Criteria. Replace as follows:

The test specimens must satisfy the strength, interstory drift angle, or link rotation angle, and inelastic rotation requirements of these provisions for the special moment frame and eccentrically braced frame connection as applicable. The test specimen must sustain the required interstory drift angle, or link rotation angle, and inelastic rotation for at least two complete loading cycles without exhibiting rapid strength deterioration.

2205A.4.3 Appendix T, Qualifying Cyclic Tests of Buckling-Restrained Braces Modification.

AISC 341, T5.3, Similarity of Brace Test Specimen and Prototype, replace Item 2 with the following:

The axial yield strength of the steel core $P_{y,sc}$ of the brace test specimen shall not be more than 20 percent above nor 50 percent less than that of the test specimen where both strengths are based on the core area, A_{sc} , multiplied by the yield strength as determined from a coupon test. In addition, the material of the test specimen shall be the same ASTM classification and grade as the prototype.

2205A.5 Modifications to AISC 358. [OSHPD 1 & 4]**2205A.5.1.2. Design Requirements, 2.1 Special and Intermediate Moment Frame Connection Types, Table 2-1 Prequalified Moment Connections modifications.**

The prequalification of bolted unstiffened extended end plate and bolted stiffened extended end plate connections in buildings is not permitted by OSHPD.

The prequalification of moment connections at orthogonal moment frames sharing common columns or moment connections attached to other than one side or two opposite sides of a column is not permitted by OSHPD.

2205A.5.2 Reduced beam section (RBS) moment connection modifications.

AISC 358, 5.3.1.7—Lateral bracing of beam shall be provided as follows: Replace the exception with the following:

Exception : *For both systems, where the beam supports a concrete structural slab that is connected between the protected zones with welded shear connectors spaced a maximum of 12 inches (300 mm) on center, supplemental top and bottom flange bracing at the reduced section may be omitted, subject to the approval of the enforcement agency. The concrete structural slab for the purposes of lateral bracing of the beam shall have a minimum of 5¼ inches (133 mm) in total thickness including metal deck, where occurs, have a minimum compressive strength of 4000 psi (27.2 MPa) at 28 days and contain 6x6-W4xW4 WWF or equal.*

SECTION 2206A STEEL JOISTS

2206A.1 General. The design, manufacture and use of open web steel joists and joist girders shall be in accordance with one of the following Steel Joist Institute (SJI) specifications:

1. SJI K-1.1
2. SJI LH/DLH-1.1
3. SJI JG-1.1

Where required, the seismic design of buildings shall be in accordance with the additional provisions of Section 2205A.2 or 2210A.5.

2206A.2 Design. The registered design professional shall indicate on the construction documents the steel joist and/or steel joist girder designations from the specifications listed in Section 2206A.1 and shall indicate the requirements for joist and joist girder design, layout, end supports, anchorage, non-SJI standard bridging, bridging termination connections and bearing connection design to resist uplift and lateral loads. These documents shall indicate special requirements as follows:

1. Special loads including:
 - 1.1. Concentrated loads;
 - 1.2. Nonuniform loads;
 - 1.3. Net uplift loads;
 - 1.4. Axial loads;
 - 1.5. End moments; and

1.6. Connection forces.

2. Special considerations including:

- 2.1. Profiles for nonstandard joist and joist girder configurations (standard joist and joist girder configurations are as indicated in the SJI catalog);
- 2.2. Oversized or other nonstandard web openings; and
- 2.3. Extended ends.

3. Deflection criteria for live and total loads for non-SJI standard joists.

2206A.3 Calculations. The steel joist and joist girder manufacturer shall design the steel joists and/or steel joist girders in accordance with the current SJI specifications and load tables to support the load requirements of Section 2206A.2. The registered design professional may require submission of the steel joist and joist girder calculations as prepared by a registered design professional responsible for the product design. If requested by the registered design professional, the steel joist manufacturer shall submit design calculations with a cover letter bearing the seal and signature of the joist manufacturer's registered design professional. In addition to standard calculations under this seal and signature, submittal of the following shall be included:

1. Non-SJI standard bridging details (e.g. for cantilevered conditions, net uplift, etc.).
2. Connection details for:
 - 2.1. Non-SJI standard connections (e.g. flush-framed or framed connections);
 - 2.2. Field splices; and
 - 2.3. Joist headers.

2206A.4 Steel joist drawings. Steel joist placement plans shall be provided to show the steel joist products as specified on the construction documents and are to be utilized for field installation in accordance with specific project requirements as stated in Section 2206A.2. Steel placement plans shall include, at a minimum, the following:

1. Listing of all applicable loads as stated in Section 2206A.2 and used in the design of the steel joists and joist girders as specified in the construction documents.
2. Profiles for nonstandard joist and joist girder configurations (standard joist and joist girder configurations are as indicated in the SJI catalog).
3. Connection requirements for:
 - 3.1. Joist supports;
 - 3.2. Joist girder supports;
 - 3.3. Field splices; and
 - 3.4. Bridging attachments.
4. Deflection criteria for live and total loads for non-SJI standard joists.
5. Size, location and connections for all bridging.
6. Joist headers.

Design approval. *Joist and joist girder design calculations and profiles with member sizes and connection details, and joist*

placement plans shall be provided to the enforcement agency and approved prior to joist fabrication, in accordance with Title 24, Part 1. Joist and joist girder design calculations and profiles with member sizes and connection details shall bear the signature and stamp or seal of the registered engineer or licensed architect responsible for the joist design. Alterations to the approved joist and joist girder design calculations and profiles with member sizes and connection details, or to fabricated joists are subject to the approval of the enforcement agency.

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5. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

3403.2.3.3 Adoption. [OSHPD 2] *All additions, alterations, repairs and seismic retrofit to the existing structures or portions thereof may be designed and constructed in accordance with the provisions of ASCE 41, as modified herein.*

3403.2.3.3.1 Referenced standards. *All referenced standards listed in ASCE 41 shall be replaced by referenced standards listed in Chapter 35 of this code and shall include all amendments to the reference standards in this code.*

3403.2.3.3.2 ASCE 41 Section 1.4—Rehabilitation Objectives. *Target Building Performance Level shall be Life Safety Building Performance Level (3-C) as defined in Section 1.5.3.3, at Basic Safety Earthquake I (BSE-I) Seismic Hazard Level as defined in Section 1.6.1.2 for Occupancy Category II Structures and Basic Safety Objective (BSO) Level as defined in Section 1.4.1 for Occupancy Category III Structures.*

3403.2.3.3.3 ASCE 41 Section 1.6—Seismic hazard. *Response spectra and acceleration time histories shall be constructed in accordance with Sections 1613, 1802.7 and 1802.8.*

3403.2.3.3.4 Analysis procedure. *The selection of a particular analysis procedure from ASCE 41 may be subject to the approval of the enforcement agent.*

3403.2.3.3.5 Design criteria. *Prior to implementation of ASCE 41 non-linear dynamic procedures, the ground motion, analysis and design methods, material assumptions and acceptance criteria proposed by the engineer shall be reviewed by the enforcement agent.*

3403.2.3.3.6 Structural observation, testing and inspections. *Construction testing, inspection and structural observation requirements shall be as required for new construction.*

3403.3 Nonstructural. Nonstructural alterations or repairs to an existing building or structure are permitted to be made of the same materials of which the building or structure is constructed, provided that they do not adversely affect any structural member or the fire-resistance rating of any part of the building or structure.

3403.4 Stairways. An alteration or the replacement of an existing stairway in an existing structure shall not be required to comply with the requirements of a new stairway as outlined in Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

SECTION 3404 FIRE ESCAPES

3404.1 Where permitted. Fire escapes shall be permitted only as provided for in Sections 3404.1.1 through 3404.1.4.

3404.1.1 New buildings. Fire escapes shall not constitute any part of the required means of egress in new buildings.

3404.1.2 Existing fire escapes. Existing fire escapes shall be continued to be accepted as a component in the means of egress in existing buildings only.

3404.1.3 New fire escapes. New fire escapes for existing buildings shall be permitted only where exterior stairs cannot be utilized due to lot lines limiting stair size or due to the sidewalks, alleys or roads at grade level. New fire escapes shall not incorporate ladders or access by windows.

3404.1.4 Limitations. Fire escapes shall comply with this section and shall not constitute more than 50 percent of the required number of exits nor more than 50 percent of the required exit capacity.

3404.2 Location. Where located on the front of the building and where projecting beyond the building line, the lowest landing shall not be less than 7 feet (2134 mm) or more than 12 feet (3658 mm) above grade, and shall be equipped with a counter-balanced stairway to the street. In alleyways and thoroughfares less than 30 feet (9144 mm) wide, the clearance under the lowest landing shall not be less than 12 feet (3658 mm).

3404.3 Construction. The fire escape shall be designed to support a live load of 100 pounds per square foot (4788 Pa) and shall be constructed of steel or other approved noncombustible materials. Fire escapes constructed of wood not less than nominal 2 inches (51 mm) thick are permitted on buildings of Type 5 construction. Walkways and railings located over or supported by combustible roofs in buildings of Type 3 and 4 construction are permitted to be of wood not less than nominal 2 inches (51 mm) thick.

3404.4 Dimensions. Stairs shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm) and landings at the foot of stairs not less than 40 inches (1016 mm) wide by 36 inches (914 mm) long, located not more than 8 inches (203 mm) below the door.

3404.5 Opening protectives. Doors and windows along the fire escape shall be protected with $\frac{3}{4}$ -hour opening protectives.

SECTION 3405 GLASS REPLACEMENT

3405.1 Conformance. The installation or replacement of glass shall be as required for new installations.

SECTION 3406 CHANGE OF OCCUPANCY

3406.1 Conformance. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancy or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancy. Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

3406.2 Certificate of occupancy. A certificate of occupancy shall be issued where it has been determined that the requirements for the new occupancy classification have been met.

3406.3 Stairways. Existing stairways in an existing structure shall not be required to comply with the requirements of a new stairway as outlined in Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

3406.4 Change of occupancy. When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure.

Exceptions:

1. Specific seismic detailing requirements of this code or ASCE 7 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from Occupancy Category I or II to Occupancy Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of this code and ASCE 7 are not required.

SECTION 3407 HISTORICAL BUILDINGS

[DSA-AC] For applications listed in Section 109.1 regulated by the Division of the State Architect—Access Compliance for Qualified Historical Buildings, see California Code of Regulations, Title 24, Part 8 (California Historical Building Code).

3407.1 Historic buildings. The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy shall not be mandatory for historic building official to not constitute a distinct life safety hazard.

3407.2 Flood hazard areas. Within flood hazard areas established in accordance with Section 1612.3, where the work proposed constitutes substantial improvement as defined in

Section 1612.2, the building shall be brought into conformance with Section 1612.

Exception: Historic buildings that are:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or
2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

SECTION 3408 MOVED STRUCTURES

3408.1 Conformance. Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.

Exception: *[HCD] After July 1, 1978, local ordinances or regulations for moved apartment houses and dwellings shall permit the retention of existing materials and methods of construction, provided the apartment house or dwelling complies with the building standards for foundations applicable to new construction and does not become or continue to be a substandard building. For additional information, see Health and Safety Code Section 17958.9.*

SECTION 3409 Reserved

SECTION 3410 COMPLIANCE ALTERNATIVES

3410.1 Compliance. The provisions of this section are intended to maintain or increase the current degree of public safety, health and general welfare in existing buildings while permitting repair, alteration, addition and change of occupancy without requiring full compliance with Chapters 2 through 33, or Sections 3401.3, and 3403 through 3407, except where compliance with other provisions of this code is specifically required in this section.

3410.2 Applicability. Structures existing prior to January 1, 2008, in which there is work involving additions, alterations or changes of occupancy shall be made to conform to the requirements of this section or the provisions of Sections 3403 through 3407. The provisions in Sections 3410.2.1 through 3410.2.5 shall apply to existing occupancies that will continue to be, or are proposed to be, in Groups A, B, E, F, M, R, S and U. These provisions shall not apply to buildings with occupancies in Group H or I.

3410.2.1 Change in occupancy. Where an existing building is changed to a new occupancy classification and this section is applicable, the provisions of this section for the

CHAPTER 34A

EXISTING STRUCTURES

SECTION 3401A GENERAL

3401A.1 Scope. The provisions of this chapter shall control the alteration, repair, addition and change of occupancy of existing structures for applications listed in Sections 110.1 (OSHPD 1), and 110.4 (OSHPD 4) regulated by the Office of Statewide Health Planning and Development (OSHPD).

These applications include hospitals, skilled nursing facilities, intermediate care facilities and correctional treatment centers.

Exception: [OSHPD 2] Single-story Type V skilled nursing or intermediate care facilities utilizing wood-frame or light-steel-frame construction as defined in Health and Safety Code Section 129725, which shall comply with Chapter 34 and any applicable amendments therein.

[DSA-AC] For applications listed in Section 109.1 regulated by the Division of State Architect—Access Compliance for accessibility requirements, see Chapter 11B, Section 1134B.

3401A.2 Maintenance. Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices or safeguards which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's designated agent shall be responsible for the maintenance of buildings and structures. To determine compliance with this subsection, the building official shall have the authority to require a building or structure to be re-inspected. The requirements of this chapter shall not provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures.

3401A.3 Compliance with other codes. Alterations, repairs, additions and changes of occupancy to existing structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy in the California Fire Code, California Mechanical Code, California Plumbing Code, and California Electrical Code.

SECTION 3402A DEFINITIONS

3402A.1 Definitions. The following term shall, for the purposes of this chapter and as used elsewhere in the code, have the following meaning. Definitions provided in Section 1613A.2, ASCE 7 Section 11.2 and ASCE 41, shall apply when appropriate in addition to terms defined in this section:

APPROVED EXISTING BUILDING means any building originally constructed in compliance with the requirements of 1973 or subsequent edition of California Building Code.

ASSOCIATED STRUCTURAL ALTERATIONS means any change affecting existing structural elements or requiring new structural elements for vertical or lateral support of an otherwise nonstructural alteration.

GENERAL ACUTE CARE HOSPITAL as used in this chapter means a hospital building as defined in Section 129725 of the Health and Safety Code and that is also licensed pursuant to subdivision (a) of Section 1250 of the Health and Safety Code, but does not include these buildings if the beds licensed pursuant to subdivision (a) of Section 1250 of the Health and Safety Code, comprise 10 percent or less of the total licensed beds of the total physical plant, and does not include facilities owned or operated, or both, by the Department of Corrections. It also precludes hospital buildings that may be licensed under the above mentioned code sections, but provide skilled nursing or acute psychiatric services only.

INCIDENTAL STRUCTURAL ALTERATIONS OR ADDITIONS are alterations or additions which would not reduce the story lateral shear force-resisting capacity by more than 5 percent or increase the story shear by more than 5 percent in any existing story.

MAJOR STRUCTURAL ALTERATIONS OR ADDITIONS are those alterations or additions of greater extent than minor structural alterations or additions.

MINOR STRUCTURAL ALTERATIONS OR ADDITIONS are alterations or additions of greater extent than incidental structural additions or alterations which would not reduce the story shear lateral-force-resisting capacity by more than 10 percent or increase base shear by more than 10 percent.

NONREQUIRED STRUCTURAL ALTERATION is any alteration of existing structural element or provision of new structural elements which is not necessary for vertical or lateral support of other work and is initiated by the applicant primarily for the purpose of increasing the vertical or lateral load-carrying strength or stiffness of an existing building.

NONSTRUCTURAL ALTERATION is any alteration which neither affects existing structural elements nor requires new structural elements for vertical or lateral support and which does not increase the lateral shear force in any story by more than 5 percent.

NPC 1, NPC 2, NPC 3 / NPC 3R, NPC 4 and NPC 5 are the building nonstructural performance categories for hospital buildings defined in Table 11.1 of California Building Standards Administrative Code (Part 1, Title 24 CCR), Chapter 6.

PEER REVIEW refers to procedure contained in Section 3414A.

PRIMARY FUNCTION. A primary function is a major activity for which the facility is intended. Areas that contain a primary function include, but are not limited to, the customer service lobby of a bank, the dining area of a cafeteria, the meeting rooms in a conference center, as well as offices and other work areas in which the activities of the public accommodation or other private entity using the facility are carried out. Mechanical rooms, boiler rooms, supply storage rooms, employee lounges or locker rooms, janitorial closets,

entrances, corridors and restrooms are not areas containing a primary function.

RECONSTRUCTION means rebuilding of any existing building to bring it into full compliance with these regulations.

REPAIR, as used in this division, means all the design and construction work affecting existing or requiring new structural elements undertaken to restore or enhance the structural and nonstructural load-resisting system participating in lateral response of a structure primarily intended to correct the effects of deterioration or impending or actual failure, regardless of cause.

- || **SPC 1, SPC 2, SPC 3, SPC 4 and SPC 5** are the building performance categories for hospital buildings defined in Table 2.5.3 of California Building Standards Administrative Code (Part 1, Title 24 CCR), Chapter 6.

TECHNICALLY INFEASIBLE. An alteration of a building or a facility that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

SECTION 3403A ADDITIONS, ALTERATIONS OR REPAIRS

3403A.1 Existing buildings or structures. Additions or alterations to any building or structure shall comply with the requirements of the code for new construction. Additions or alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any provisions of this code. An existing building plus additions shall comply with the height and area provisions of Chapter 5. Portions of the structure not altered and not affected by the alteration are not required to comply with the code requirements for a new structure.

3403A.1.1 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612A.3, any additions, alterations or repairs that constitute substantial improvement of the existing structure, as defined in Section 1612A.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

3403A.2 Structural. Additions or alterations to an existing structure shall not increase the force in any structural element by more than 5 percent, unless the increased forces on the element are still in compliance with the code for new structures, nor shall the strength of any structural element be decreased to less than that required by this code for new structures. Where repairs are made to structural elements of an existing building, and uncovered structural elements are found to be unsound or otherwise structurally deficient, such elements shall be made to conform to the requirements for new structures.

3403A.2.1 Existing live load. Where an existing structure heretofore is altered or repaired, the minimum design loads for the structure shall be the loads applicable at the time of erection, provided that public safety is not endangered thereby.

3403A.2.2 Live load reduction. If the approved live load is less than required by Section 1607A, the areas designed for the reduced live load shall be posted in with the approved load. Placards shall be of an approved design.

3403A.2.3 Seismic. Additions, alterations or modification or change of occupancy of existing buildings shall be in accordance with this section for the purposes of seismic considerations.

3403A.2.3.1 Additions to existing buildings. An addition that is structurally independent from an existing structure shall be designed and constructed with the seismic requirements for new structures. An addition that is not structurally independent from an existing structure shall be designed and constructed such that the entire structure conforms to the seismic-force-resistance requirements for new structures unless the following conditions are satisfied:

1. The addition conforms with the requirements for new structures,
2. The addition does not increase the seismic forces in any structural element of the existing structure by more than 5 percent cumulative since the original construction, unless the element has the capacity to resist the increased forces determined in accordance with ASCE 7, and
3. Additions do not decrease the seismic resistance of any structural element of the existing structure by more than 5 percent cumulative since the original construction, unless the element has the capacity to resist the forces determined in accordance with ASCE 7. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

3403A.2.3.2 Alterations. Alterations are permitted to be made to any structure without requiring the structure to comply with Section 1613A, provided the alterations conform to the requirements for a new structure. Alterations that increase the seismic force in any existing structural element by more than 5 percent cumulative since the original construction or decrease the design strength of any existing structural element to resist seismic forces by more than 5 percent cumulative since the original construction shall not be permitted unless the entire seismic-force-resisting system is determined to conform to ASCE 7 for a new structure. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

Exception: Alterations to existing structural elements or additions of new structural elements that are not required by ASCE 7 and are initiated for the pur-

pose of increasing the strength or stiffness of the seismic-force-resisting system of an existing structure need not be designed for forces conforming to ASCE 7, provided that an engineering analysis is submitted indicating the following:

1. The design strength of existing structural elements required to resist seismic forces is not reduced.
2. The seismic force to required existing structural elements is not increased beyond their design strength.
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16A.
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16A.
5. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

3403A.2.3.3 Adoption. Except for the modifications as set forth in Sections 3411A through 3413A, all additions, alterations, repairs and seismic retrofit to existing structures or portions thereof may be designed and constructed in accordance with the provisions of ASCE 41.

3403A.2.3.3.1 Referenced standards. All referenced standards listed in ASCE 41 shall be replaced by referenced standards listed in Chapter 35 of this code and shall include all amendments to the reference standards in this code.

3403A.2.3.3.2 ASCE 41 Section 1.4 –Rehabilitation Objectives. Target Building Performance Level shall be as follows:

- a. **For general acute care hospitals along with all structures required for their continuous operation and access - Immediate Occupancy Structural Performance Level (S-1)** as defined in Section 1.5.1.1 at Basic Safety Earthquake 1 (BSE-1) Seismic Hazard Level as defined in Section 1.6.1.2 and Collapse Prevention Structural Performance Level (S-5) per Section 1.5.1.5 at Basic Safety Earthquake 2 (BSE-2) Seismic Hazard Level as defined in Section 1.6.1.1. The nonstructural performance level shall satisfy the requirements of this code for new hospital buildings.

Exceptions: Buildings satisfying requirements of Sections 3403A.2.3.4, 3411A.2 or 3411A.3.

- b. **For pre-1973 Buildings which will not be used for general acute care services after January 1, 2030 - Basic Safety Objective (BSO) Level** as defined in Section 1.4.1. BSO level includes Life Safety Building Performance Level (3-C) as de-

defined in Section 1.5.3.3 at the Basic Safety Earthquake 1 (BSE-1) Seismic Hazard Level as defined in Section 1.6.1.2 and Collapse Prevention Building Performance Level (5-E) per Section 1.5.3.4 at the Basic Safety Earthquake 2 (BSE-2) Seismic Hazard Level as defined in section 1.6.1.1.

Exceptions: Buildings satisfying requirements of Sections 3403A.2.3.4, 3411A.3.2.1 and 3411A.3.2.2.

- c. **All Others - Immediate Occupancy Building Performance Level of (1-B)** as defined in Section 1.5.3.2 at Basic Safety Earthquake 1 (BSE-1) Seismic Hazard Level as defined in Section 1.6.1.2 and Collapse Prevention Building Performance Level (5-E) per Section 1.5.3.4 at Basic Safety Earthquake 2 (BSE-2) Seismic Hazard Level as defined in Section 1.6.1.1.

3403A.2.3.3.3 Material testing required. Use of material properties based on historical information as default values shall not be permitted.

3403A.2.3.3.4 Analysis procedure. The selection of a particular analysis procedure from ASCE 41 shall be subject to the approval of the enforcement agent.

3403A.2.3.3.5 Design criteria. Prior to implementation of ASCE 41 nonlinear dynamic procedures, the ground motion, analysis and design methods, material assumptions and acceptance criteria proposed by the engineer shall be peer reviewed in accordance with Section 3414A and reviewed by the enforcement agent.

3403A.2.3.3.6 Structural observation, testing and inspections. Construction testing, inspection and structural observation requirements shall be as required for new construction.

3403A.2.3.4 Seismic Evaluation and Retrofit of General Acute Care Hospitals. Notwithstanding any other requirements of this code, all existing general acute care hospitals shall comply with the requirements specified in Chapter 6, Part 1, Title 24.

3403A.2.3.4.1 SPC5 and NPC 4 / NPC5. Structures and nonstructural components and systems satisfying the requirements of this Code for new buildings for Occupancy Category IV shall be considered to satisfy the requirements of SPC 5 and NPC 4. NPC 4 buildings satisfying operational requirements for NPC 5 of Table 11.1, Chapter 6, Part 1, Title 24, shall be placed in non-structural performance category NPC 5.

3403A.2.3.4.2 SPC 5 using ASCE 41. Structures satisfying the requirements of Immediate Occupancy Structural Performance Level (S-1) per Section 1.5.1.1 of ASCE 41 at BSE-1, Collapse Prevention Performance Level S-5 per Section 1.5.1.5 of ASCE 41 at BSE-2 and items identified in Chapter 6, Article 10, Part 1, Title 24, satisfying the requirements of Immediate Occupancy Nonstructural Performance

Level (N-B) per Section 1.5.2.2 of ASCE 41 at BSE-1 shall be considered to comply with SPC 5 requirements of Table 2.5.3, Chapter 6, Part 1, Title 24.

3403A.2.3.4.3 SPC 2 using ASCE 41. Structures satisfying the requirements of Life Safety Structural Performance Level (S-3) per Section 1.5.1.3 of ASCE 41 at BSE-1 and items identified in Chapter 6, Article 10, Title 24, Part 1 satisfying the requirements of Life Safety Nonstructural Performance Level (N-C) per Section 1.5.2.3 of ASCE 41 at BSE-1, shall be considered to comply with SPC 2 requirements of Table 2.5.3, Chapter 6, Part 1, Title 24.

3403A.2.4.4 NPC. Nonstructural components for Immediate Occupancy Nonstructural Performance Level (N-B) in Section 1.5.2.2 shall meet the requirements of this code for new buildings. Nonstructural components for Operational Nonstructural Performance Level (N-A) in Section 1.5.2.1 shall meet performance level N-B and Section 3413A.1.30. Building satisfying the requirements of Non-structural Performance Level N-A and N-B as described in this section shall be considered to satisfy the requirements of NPC 5 & NPC 4 of Table 11.1, Chapter 6, Part 1, Title 24 respectively.

Immediate Occupancy Nonstructural Performance Level (N-B) in Section 1.5.2.2 and Life Safety Nonstructural Performance Level (N-C) in Section 1.5.2.3 of ASCE 41 at BSE-1 shall be considered equivalent to NPC 3 / NPC 2 and NPC 3R requirements respectively of Table 11.1, Chapter 6, Part 1, Title 24. For NPC 3 / NPC 3R / NPC 2, only components listed in Table 11.1, Chapter 6, Part 1, Title 24, for NPC 3 / NPC 3R / NPC 2 need to satisfy the requirements specified above.

Exceptions:

1. Evaluation procedure in Article 11, Chapter 6, Part 1, Title 24 shall be used for seismic evaluation of NPC 2, NPC 3 / NPC 3R, NPC 4 and NPC 5, where specific procedure is not outlined in ASCE 41. Administrative and permitting provisions outlined in Article 11, Chapter 6, Part 1, Title 24 shall apply.
2. Anchorage and bracing of nonstructural components in buildings in seismic performance categories SPC 1 and SPC 2 with a performance level of NPC 3R may comply with the provisions of Section 1630A of the 1995 California Building Code using an importance factor $I_p=1.0$. The capacity of welds, anchors and fasteners shall be determined in accordance with requirements of this Code.
3. Anchorage and bracing of nonstructural components in buildings in seismic performance categories SPC 1 or SPC 2 with a performance level of NPC 3 or higher, and SPC 3 or SPC 4, may comply with the provisions of Section 1630B of the 1998 Califor-

nia Building Code using an importance factor $I_p=1.5$. The capacity of welds, anchors and fasteners shall be determined in accordance with requirements of this code.

A continuous load path of sufficient strength and stiffness between the component and the supporting structure shall be verified. Local elements of the supporting structure shall be verified for the component loads where they control the design of the elements or their connections. Increases in F_p due to anchorage conditions (for example shallow anchors) need not be considered. For NPC 3R, the adequacy of load path for nonstructural elements need only be verified when the total reaction at the point of support (including the application of F_p) exceeds the following limits:

1. 250 pounds for components or equipment attached to light frame walls. For the purposes of this requirement, the sum of the absolute value of all reactions due to component loads on a single stud shall not exceed 250 pounds.
2. 1,000 pounds for components or equipment attached to roofs, or walls of reinforced concrete or masonry construction.
3. 2,000 pounds for components or equipment attached to floors or slabs-on-grade.

Exception: If the anchorage or bracing is configured in a manner that results in significant torsion on a supporting structural element, the effects of the nonstructural reaction force on the structural element shall be considered in the anchorage design.

3403A.2.3.5 Repair of earthquake damage. Repair of Earthquake Damage shall comply with Article 20, Chapter 7, Part 1, Title 24,.

3403A.3 Nonstructural. Nonstructural alterations or repairs to an existing building or structure are permitted to be made of the same materials of which the building or structure is constructed, provided that they do not adversely affect any structural member or the fire-resistance rating of any part of the building or structure.

3403A.4 Stairways. An alteration or the replacement of an existing stairway in an existing structure shall not be required to comply with the requirements of a new stairway as outlined in Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

SECTION 3404A FIRE ESCAPES

3404A.1 Where permitted. Fire escapes shall be permitted only as provided for in Sections 3404A.1.1 through 3404A.1.4.

3404A.1.1 New buildings. Fire escapes shall not constitute any part of the required means of egress in new buildings.

3404A.1.2 Existing fire escapes. Existing fire escapes shall be continued to be accepted as a component in the means of egress in existing buildings only.

3404A.1.3 New fire escapes. New fire escapes for existing buildings shall be permitted only where exterior stairs cannot be utilized due to lot lines limiting stair size or due to the sidewalks, alleys or roads at grade level. New fire escapes shall not incorporate ladders or access by windows.

3404A.1.4 Limitations. Fire escapes shall comply with this section and shall not constitute more than 50 percent of the required number of exits nor more than 50 percent of the required exit capacity.

3404A.2 Location. Where located on the front of the building and where projecting beyond the building line, the lowest landing shall not be less than 7 feet (2134 mm) or more than 12 feet (3658 mm) above grade, and shall be equipped with a counter-balanced stairway to the street. In alleyways and thoroughfares

(TEXT CONTINUES ON 568)

EXISTING STRUCTURES

less than 30 feet (9144 mm) wide, the clearance under the lowest landing shall not be less than 12 feet (3658 mm).

3404A.3 Construction. The fire escape shall be designed to support a live load of 100 pounds per square foot (4788 Pa) and shall be constructed of steel or other approved noncombustible materials. Fire escapes constructed of wood not less than nominal 2 inches (51 mm) thick are permitted on buildings of Type 5 construction. Walkways and railings located over or supported by combustible roofs in buildings of Type 3 and 4 construction are permitted to be of wood not less than nominal 2 inches (51 mm) thick.

3404A.4 Dimensions. Stairs shall be at least 22 inches (559 mm) wide with risers not more than, and treads not less than, 8 inches (203 mm) and landings at the foot of stairs not less than 40 inches (1016 mm) wide by 36 inches (914 mm) long, located not more than 8 inches (203 mm) below the door.

3404A.5 Opening protectives. Doors and windows along the fire escape shall be protected with $\frac{3}{4}$ -hour opening protectives.

SECTION 3405A GLASS REPLACEMENT

3405A.1 Conformance. The installation or replacement of glass shall be as required for new installations.

SECTION 3406A CHANGE OF OCCUPANCY

3406A.1 Conformance. No change shall be made in the use or occupancy of any building that would place the building in a different division of the same group of occupancy or in a different group of occupancies, unless such building is made to comply with the requirements of this code for such division or group of occupancy. Subject to the approval of the building official, the use or occupancy of existing buildings shall be permitted to be changed and the building is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

3406A.2 Certificate of occupancy. A certificate of occupancy shall be issued where it has been determined that the requirements for the new occupancy classification have been met.

3406A.3 Stairways. Existing stairways in an existing structure shall not be required to comply with the requirements of a new stairway as outlined in Section 1009 where the existing space and construction will not allow a reduction in pitch or slope.

3406A.4 Change of occupancy. When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure.

Exception: Specific seismic detailing requirements of this code or ASCE 7 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength,

redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.

SECTION 3407A HISTORIC BUILDINGS

3407A.1 Historic buildings. See Title 24, Part 8 The provisions of this code relating to the construction, repair, alteration, addition, restoration and movement of structures, and change of occupancy shall not be mandatory for historic buildings where such buildings are judged by the building official to not constitute a distinct life safety hazard.

3407A.2 Flood hazard areas. Within flood hazard areas established in accordance with Section 1612A.3, where the work proposed constitutes substantial improvement as defined in Section 1612A.2, the building shall be brought into conformance with Section 1612A.

Exception: Historic buildings that are:

1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places; or
2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
3. Designated as historic under a state or local historic preservation program that is approved by the Department of Interior.

SECTION 3408A MOVED STRUCTURES

3408A.1 Conformance. Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.

SECTION 3409A *Reserved*

[EB] SECTION 3410A COMPLIANCE ALTERNATIVES

3410A.1 Compliance. The provisions of this section are intended to maintain or increase the current degree of public safety, health and general welfare in existing buildings while permitting repair, alteration, addition and change of occupancy without requiring full compliance with Chapter 2 through 33, or Section 3401A.3, and 3403A through 3407A, except where compliance with other provisions of this code is specifically required in this section.

3410A.2 Applicability. Structures existing prior to *January 1, 2008* in which there is work involving additions, alterations or changes of occupancy shall be made to conform to the requirements of this section or the provisions of Section 3403A through 3407A. The provisions in Sections 3410A.2.1 through 3410A.2.5 shall apply to existing occupancies that will continue to be, or are proposed to be, in Groups A, B, E, F, M, R, S

**TABLE 3410A.8
MANDATORY SAFETY SCORES^a**

OCCUPANCY	FIRE SAFETY (MFS)	MEANS OF EGRESS (MME)	GENERAL SAFETY (MGS)
A-1	16	27	27
A-2	19	30	30
A-3	18	29	29
A-4, E	23	34	34
B	24	34	34
F	20	30	30
M	19	36	36
R	17	34	34
S-1	15	25	25
S-2	23	33	33

a. MFS = Mandatory Fire Safety;
MME = Mandatory Means of Egress;
MGS = Mandatory General Safety.

3410A.9 Evaluation of building safety. The mandatory safety score in Table 3410A.8 shall be subtracted from the building score in Table 3410A.7 for each category. Where the final score for any category equals zero or more, the building is in compliance with the requirements of this section for that category. Where the final score for any category is less than zero, the building is not in compliance with the requirements of this section.

3410A.9.1 Mixed occupancies. For mixed occupancies, the following provisions shall apply:

1. Where the separation between mixed occupancies does not qualify for any category indicated in Section 3410A.6.16, the mandatory safety scores for the occupancy with the lowest general safety score in Table 3410A.8 shall be utilized (see Section 3410A.6.)
2. Where the separation between mixed occupancies qualifies for any category indicated in Section 3410A.6.16, the mandatory safety scores for each occupancy shall be placed against the evaluation scores for the appropriate occupancy.

**TABLE 3410A.9
EVALUATION FORMULAS^a**

FORMULA	T.3410A.7	T.3410A.8	SCORE	PASS	FAIL
FS-MFS ≥ 0	_____ (FS)	- _____ (MFS) =	_____	_____	_____
ME-MME ≥ 0	_____ (ME)	- _____ (MME) =	_____	_____	_____
GS-MGS ≥ 0	_____ (GS)	- _____ (MGS) =	_____	_____	_____

a. FS = Fire Safety
ME = Means of Egress
GS = General Safety
MFS = Mandatory Fire Safety
MME = Mandatory Means of Egress
MGS = Mandatory General Safety

**SECTION 3411A
ADDITIONS, ALTERATIONS, REPAIRS AND
SEISMIC RETROFIT TO EXISTING BUILDINGS OR
STRUCTURES**

Existing hospital buildings (as defined in Section 7-111 Part 1, Title 24, Building Standards Administrative Code).

Note: Alterations to lateral shear force-resisting capacity and story lateral shear forces shall be considered to be cumulative for purposes of defining incidental or minor alterations or additions. The percentage of cumulative changes shall be based on as-built conditions existing on March 7, 1973 or since the original construction if built after March 7, 1973.

3411A.1 Alterations. For this section, alterations include any additions, alterations, repairs and/or seismic retrofit to a hospital building or portions thereof. The provision of Section 3403A shall apply for hospital buildings.

3411A.2 Seismic retrofit. Any seismic retrofit of hospital buildings required by Article 2 and Article 11, Chapter 6, Part 1, Title 24, shall meet the requirements of Section 3403A.2.3.4.

Exception: Hospital buildings evaluated to SPC 1 due to deficiencies identified by Article 10, Chapter 6, Part 1, Title 24, may be upgraded to SPC 2 by altering, repairing or seismically retrofitting these conditions in accordance with the requirements of Section 3403A.2.3.

3411A.3 Alterations, additions and repairs to existing buildings or structures not required by Chapter 6, Part 1, Title 24.

3411A.3.1 Approved existing buildings. Structural alterations or repairs may be made to an approved building, provided the entire building, as modified, including structural alterations or repairs, conforms to Section 3403A.2.3, except requirements for the seismic structural performance category (SPC) of the building as determined by Chapter 6, Part 1, Title 24 shall apply. Additions shall conform to the requirements of these regulations for new construction.

3411A.3.2 Pre-1973 buildings.

3411A.3.2.1 Incidental structural alterations, additions or repairs. The existing structural elements affected by the alteration, addition or repair shall conform or shall be made to conform to the vertical load requirements of these regulations. Incidental structural additions will be permitted, provided the additions meet these regulations for new construction using importance

factor, I , equal to or greater than 1.0. Alterations or repairs to the existing affected lateral-load-resisting elements must meet the requirements of Section 3403A.2.3.

3411A.3.2.2 Minor structural alteration, additions or repairs. Minor structural alterations, additions or repairs shall be permitted, provided they meet the following: Alterations to existing gravity and/or lateral-load-resisting systems shall be made to conform to the requirements of Section 3403A.2.3; and additions shall meet all of the requirements of these regulations for new construction using an importance factor, I , equal to or greater than 1.0.

3411A.3.2.3 Major structural alteration, additions or repairs. Major structural alterations, additions or repairs shall be permitted, provided the entire building, as modified, including the structural alterations or repairs, conforms to the requirements of Section 3403A.2.3. Additions shall meet the requirements of these regulations for new construction.

It shall also be demonstrated by a written report submitted by the structural engineer, acceptable to the enforcement agency, that an investigation of the existing building structure shows it to be constructed in a reasonable conformance with the submitted drawings and specifications.

3411A.3.2.4 Removal of stories. An alteration which involves the removal of one or more entire stories will be permitted if the lateral-load-resisting capacity of the remaining structure is not reduced.

An alteration which involves the removal of other than one or more entire stories will be permitted provided that entire building conforms to Section 3403A.2.3.

SECTION 3412A RESERVED

SECTION 3413A MODIFICATIONS TO ASCE 41

3413A.1 General.

The text of ASCE 41 shall be modified as indicated in Sections 3413A.1.1 through 3413A.1.32.

Reference to sections of International Building Code (IBC) in ASCE 41 shall comply with requirements of Sections 110.1 & 110.4.

3413A.1.1 ASCE 41 Section 1.1. Modify ASCE 41 Section 1.1 with the following:

Seismic evaluations shall be performed using procedure and criteria of ASCE 41 except for general acute care hospitals, which shall be evaluated per Chapter 6, Part I, Title 24 when required per provision of that chapter.

3413A.1.2 ASCE 41 Section 1.6 Seismic Hazard. Modify ASCE 41 Section 1.6 by the following:

Response spectra and acceleration time histories shall be constructed in accordance with Sections 1613A, 1614A and 1802A.6. Basic Safety Earthquake 2 (BSE-2) in ASCE 41 shall be same as Maximum Considered Earthquake (MCE) in ASCE 7.

3413A.1.3 ASCE 41 Section 2.2.6. Modify ASCE 41 Section 2.2.6 by the following:

Data Collection Requirements. The extent of data collection shall be at Comprehensive level for all structures except that data collection at Usual level shall be permitted for structures with BSO or lower target performance objective. Materials properties testing program shall be preapproved by the enforcement agent.

For buildings built under an OSHPD permit based on 1976 or later edition of California Building Code, where materials properties are shown on design drawings and original materials test data are available, no materials testing shall be required when approved by the enforcement agent.

3413A.1.4 ASCE 41 Section 2.4.1.1. Modify ASCE 41 Section 2.4.1.1 by the following:

1. If one or more component DCRs exceed 1.5 the Immediate Occupancy Structural Performance Level (S-1) or 2.0 for the Life Safety Structural Performance Level (S-3) and any irregularity described in Sections 2.4.1.1.1 through 2.4.1.1.4 are present, then linear procedures are not applicable and shall not be used.
2. Linear procedures are not applicable to moment-resisting frames where plastic hinges do not form in either the beam at the face of column or in the column panel zone.

3413A.1.5 ASCE 41 Section 2.4.2.1 Modify ASCE 41 Section 2.4.2.1 by the following:

Nonlinear Static Procedure. If higher mode effects are significant, either the Nonlinear Dynamic Procedure shall be used.

3413A.1.6 ASCE 41 Section 2.4.4.5. Modify ASCE 41 Section 2.4.4.5 by the following:

Material Properties. Expected material properties are not permitted to be determined by multiplying lower bound values by the assumed factors specified in Chapters 5 through 8.

3413A.1.7 ASCE 41 Section 3.2.10.1. Modify ASCE 41 Section 3.2.10.1 by the following:

Linear Procedures. Equation 3-5 is not permitted by OSHPD.

3413A.1.8 ASCE 41 Section 3.3.1.3.5. Replace ASCE 41 Section 3.3.1.3.5 as follows:

Unreinforced Masonry Buildings. Unreinforced masonry not permitted by OSHPD.

3413A.1.9 ASCE 41 Section 3.3.3.2.2 Modify ASCE 41 Section 3.3.3.2.2 with the following:

Simplified NSP Analysis. Not permitted by OSHPD.

3413A.1.10 ASCE 41 Section 3.4.2.2. Modify ASCE 41 Section 3.4.2.2 by the following:

Acceptance Criteria for Linear Procedures—Drift Limitations. The interstory drift ratio shall not exceed the drift limits for Occupancy Category IV in ASCE 7 Table 12.12-1 due to forces corresponding to BSE-1, except that buildings designed to BSO or lower performance levels are permitted to meet the drift limits for Occupancy Category II. For dual systems, the least interstory drift ratio shall control.

Exception: Larger interstory drift ratios shall be permitted where justified by rational analysis that both structural and nonstructural elements can tolerate such drift and approved by the enforcement agent.

3413A.1.11 ASCE 41 Section 3.4.3.2.1. Modify ASCE 41 Section 3.4.3.2.1 by the following:

Deformation-Controlled Actions. For any building required to meet the Operational Building Performance Level, 1-A or Immediate Occupancy Building Performance Level, 1-B, primary components shall be within the acceptance criteria for primary components and secondary components shall be within the acceptance criteria for secondary components.

3413A.1.12 ASCE 41 Section 4.4. Modify ASCE 41 Section 4.4 by the followings:

Foundation Strength and Stiffness. Foundation and soil strength shall be used to evaluate potential overturning, uplift and sliding for fixed base assumptions, and stiffness for flexible base assumptions, including deformations associated with those actions.

3413A.1.13 ASCE 41 Section 4.4.1.1. Replace ASCE 41 Section 4.4.1.1 as follows:

Presumptive Capacities. Not permitted by OSHPD.

3413A.1.14 ASCE 41 Section 4.4.1.2. Replace ASCE 41 Section 4.4.1.2 as follows:

Prescriptive Expected Capacities. Not permitted by OSHPD.

3413A.1.15 ASCE 41 Section 4.4.3.2.2. Modify ASCE 41 Section 4.4.3.2.2 by the following:

Flexible Base Assumption. The soil strength shall be evaluated.

3413A.1.16 ASCE 41 Section 4.5. Modify ASCE 41 Section 4.5 by the following:

Seismic Earth Pressure. Where the grade difference from one side of the building to another exceeds one-half story height, the seismic increment of earth pressure shall be added to the gravity lateral earth pressure to evaluate the building overturning and sliding stability and the lateral force-resisting system below grade in combination with the building seismic forces.

3413A.1.17 ASCE 41 Table 5-6. Modify ASCE 41 Table 5.6 by the following:

Acceptance Criteria for Nonlinear Procedures—Structural Steel Components. For fully and partially restrained

moment connections designed to 1989 or prior edition of Part 2, Title 24 shall be verified for the presence of welds using E70T-4 electrodes. Where E70T-4 electrodes are present, the plastic rotation angles and residual strength ratios used shall be substantiated by the statistical analysis of three or more applicable cyclic test results subject to the approval of the enforcement agent.

3413A.1.18 ASCE 41 Section 6.7.1.1. Modify ASCE 41 Section 6.7.1.1 by the following:

Monolithic Reinforced Concrete Shear Walls and Wall Segments. For nonlinear procedures, shear walls or wall segments with axial loads greater than 0.35, P_o shall be included in the model as primary elements with appropriate strength and stiffness degrading properties assigned to those components subject to the approval of the enforcement agent. For linear procedures, the effects of deformation compatibility shall be investigated using moment-curvature section analyses and cyclic testing results of similar components to determine whether strengthening is necessary to maintain the gravity load carrying capacity of that component.

3413A.1.19 ASCE 41 Section 7.3.2. Replace ASCE 41 Section 7.3.2 as follows:

Unreinforced Masonry Walls and Piers In-plane. Not permitted by OSHPD.

3413A.1.20 ASCE 41 Section 7.3.3. Replace ASCE 41 Section 7.3.3 as follows:

Unreinforced Masonry Walls Out-of-plane. Not permitted by OSHPD.

3413A.1.21 ASCE 41 Section 7.3.4.2.2, Shear strength of walls and piers. Modify ASCE 41 Section 7.3.4.2.2 by the following:

The spacing of shear reinforcing, S , shall be less than or equal to the wall pier clear height divided by 2 or the story height divided by 2, whichever is smaller.

3413A.1.22 ASCE 41 Section 9.2.4. Modify ASCE 41 Section 9.2.4 by the following:

Linear Procedures. Verification of the interstory lateral displacements, isolator displacements, the strength adequacy of the seismic-force-resisting system and isolation system and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

3413A.1.23 ASCE 41 Section 9.2.5.1. Modify ASCE 41 Section 9.2.5.1 by the following:

Nonlinear Static Procedure. Verification of the interstory lateral displacements, isolator displacements, the strength adequacy of the seismic-force-resisting system and isolation system and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

3413A.1.24 ASCE 41 Section 9.2.9. Modify ASCE 41 Section 9.2.9 by the following:

Isolation System Testing and Design Properties—Production Tests. Production testing and associated acceptance criteria shall be as approved by the enforcement agent.

3413A.1.25 ASCE 41 Section 9.2.9.2.9. Modify ASCE 41 Section 9.2.9.2.9 by the following:

Testing Similar Units. The testing exemption shall require approval by the enforcement agent.

3413A.1.26 ASCE 41 Section 9.3.4. Modify ASCE 41 Section 9.3.4 by the following:

Linear Procedures. Verification of the interstory lateral displacements, damper relative velocities and displacements, the strength adequacy of the seismic-force-resisting system and damping system and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

3413A.1.27 ASCE 41 Section 9.3.5.1. Modify ASCE 41 Section 9.3.5.1 by the following:

Nonlinear Static Procedure. Verification of the interstory lateral displacements, damper relative velocities and displacements, the strength adequacy of the seismic-force-resisting system and damping system and anchorage to the foundation shall be accomplished using the Nonlinear Dynamic Procedure.

3413A.1.28 ASCE 41 Section 9.3.8. Modify ASCE 41 Section 9.3.8 by the following:

Required Tests of Energy Dissipation Devices—Production Tests. Production testing and associated acceptance criteria shall be as approved by the enforcement agent.

3413A.1.29 ASCE 41 Chapter 10. Replace ASCE 41 Chapter 10 as follows:

Simplified Rehabilitation. Not permitted by OSHPD.

3413A.1.30 ASCE 41 Section 11.3.2. Modify ASCE 41 Section 11.3.2 with the following:

Operational Nonstructural Performance Level (N-A) Requirements. All Structures shall meet Immediate Occupancy Nonstructural Performance Level (N-B) and facility shall have on-site supplies of water and holding tanks for wastewater, sufficient for 72 hours emergency operations, are integrated into the building plumbing systems. As an alternative, hook-ups to allow for the use of transportable sources of water and sanitary waste water disposal have been provided. An on-site emergency system as defined within Part 3, Title 24 is incorporated into the building electrical system for critical care areas. Additionally, the system shall provide for radiological service and an onsite fuel supply for 72 hours of acute care operation.

3413A.1.31 ASCE 41 Section 11.9.4.3.1. Modify ASCE 41 Section 11.9.4.3.1 with the following:

Ceilings in all Categories shall satisfy requirements for ceilings in Category C specified in this section.

3413A.1.32 ASCE 41 Section 11.10.2.4. Modify ASCE 41 Section 11.10.2.4 by the following:

For general acute care hospital, Nonstructural Evaluation shall comply with requirements of Section 11.2, Chapter 6, Part 1, Title 24.

SECTION 3414A PEER REVIEW REQUIREMENTS

3414A.1 General. Independent peer review is an objective technical review by knowledgeable reviewer(s) experienced in structural design, analysis and performance issues involved. The reviewer(s) shall examine the available information on the condition of building, basic engineering concept employed and recommendations for action.

3414A.2 Timing of independent review. The independent reviewer(s) shall be selected prior to the initiation of substantial portions of the design and analysis work that is to be reviewed, and review shall start as soon as practical and sufficient information defining the project is available.

3414A.3 Qualifications and terms of employment. The reviewer shall be independent from the design and construction team.

3414A.3.1 The reviewer(s) shall have no other involvement in the project before, during or after the review, except in a review capacity.

3414A.3.2 The reviewer shall be selected and paid by owner and shall have technical expertise in review of buildings similar to the one being reviewed, as determined by the enforcement agent.

3414A.3.3 The reviewer (in case of review team, the chair) shall be a California-licensed structural engineer who is familiar with technical issues and regulations governing the work to be reviewed.

3414A.3.4 The reviewer shall serve through completion of the project and shall not be terminated except for failure to perform the duties specified herein. Such termination shall be in writing with copies to the enforcement agent, owner and the engineer of record. When a reviewer is terminated or resigns, a qualified replacement shall be appointed within 10 working days.

3414A.4 Scope of review. Review activities shall include, where appropriate, available construction documents, design criteria, observation of the condition of structure, all new and original inspection reports, including methods of sampling, analyses prepared by the engineer of record and consultants and the retrofit or repair design. Review shall include consideration of the proposed design approach, method, materials and details.

3414A.5 Reports. The reviewer(s) shall prepare a written report to the owner and responsible enforcement agent that covers all aspects of the review performed, including conclusions reached by the reviewer. A report shall be issued after the schematic phase, during design development and at the completion of construction documents, but prior to the issuance of a permit. Such report shall include, at the minimum, statement of the following.

1. Scope of engineering design peer review with limitations defined.
2. The status of the project documents at each review stage.
3. Ability of selected materials and framing systems to meet the performance criteria with given loads and configuration.

4. *Degree of structural system redundancy and the deformation compatibility among structural and nonstructural elements.*
5. *Basic constructability of the retrofit or repair system.*
6. *Other recommendations that will be appropriate for the specific project.*
7. *Presentation of the conclusions of the reviewer identifying any areas that need further review, investigation and/or clarification.*
8. *Recommendations.*

3414A.6 Responses and corrective actions. *The engineer of record shall review the report from the reviewer(s) and shall develop corrective actions and other responses as appropriate. Changes observed during construction that affect the seismic-resisting system shall be reported to the reviewer in writing for review and recommendations. All reports, responses and corrective actions prepared pursuant to this section shall be submitted to the responsible enforcement agent and the owner along with other plans, specifications and calculations required. If the reviewer resigns or is terminated by the owner prior to completion of the project, then the reviewer shall submit copies of all reports, notes and the correspondence to the responsible enforcement agent, the owner and the engineer of record within 10 working days of such termination.*

(TEXT CONTINUES ON PAGE 583)

AITC

American Institute of Timber Construction
 Suite 140
 7012 S. Revere Parkway
 Englewood, CO 80112

Standard reference number	Title	Referenced in code section number
AITC Technical Note 7-96	Calculation of Fire Resistance of Glued Laminated Timbers	721.6.3.3
AITC 104-03	Typical Construction Details	2306.1
AITC 110-01	Standard Appearance Grades for Structural Glued Laminated Timber	2306.1
<i>AITC 111-05</i>	<i>Recommended Practice for Protection of Structural Glued Laminated Timber During Transit, Storage and Erection</i>	<i>2303.1.3.1</i>
AITC 113-01	Standard for Dimensions of Structural Glued Laminated Timber	2306.1
AITC 117-04	Standard Specifications for Structural Glued Laminated Timber of Softwood Species	2306.1
AITC 119-96	Standard Specifications for Structural Glued Laminated Timber of Hardwood Species	2306.1
AITC 200-04	Manufacturing Quality Control Systems Manual for Structural Glued Laminated Timber	2306.1
<i>AITC 404-05</i>	<i>Standard for Radially Reinforcing Curved Glued Laminate Timber Members to Resist Radial Tension</i>	<i>2303.1.3.1</i>
ANSI/AITC A 190.1-02	Structural Glued Laminated Timber	2303.1.3, 2306.1

ALI

Automotive Lift Institute
 P.O. Box 85
 Courtland, NY 13045

Standard reference number	Title	Referenced in code section number
ALI ALCTV-98	Standard for Automotive Lifts—Safety Requirements for Construction, Testing and Validation (ANSI)	3001.2

ANSI

American National Standards Institute
 25 West 43rd Street, Fourth Floor
 New York, NY 10036

Standard reference number	Title	Referenced in code section number
A13.1-96 (Reaffirmed 2002)	Scheme for the Identification of Piping Systems	415.8.6.4
A108.1A-99	Installation of Ceramic Tile in the Wet-set Method, with Portland Cement Mortar	2103.1
A108.1B-99	Installation of Ceramic Tile, Quarry Tile on a Cured Portland Cement Mortar Setting Bed with Dry-set or Latex-portland Mortar	2103.1
A108.4-99	Installation of Ceramic Tile with Organic Adhesives or Water-cleanable Tile-setting Epoxy Adhesive	2103.10.6
A108.5-99	Installation of Ceramic Tile with Dry-set Portland Cement Mortar or Latex-portland Cement Mortar	2103.9.3, 2103.10.1, 2103.10.2
A108.6-99	Installation of Ceramic Tile with Chemical-resistant, Water Cleanable Tile-setting and -grouting Epoxy	2103.10.3
A108.8-99	Installation of Ceramic Tile with Chemical-resistant Furan Resin Mortar and Grout	2103.10.4
A108.9-99	Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout	2103.10.5
A108.10-99	Installation of Grout in Tilework	2103.10.7
A118.1-99	American National Standard Specifications for Dry-set Portland Cement Mortar	2103.10.1
A118.3-99	American National Standard Specifications for Chemical-resistant, Water-cleanable Tile-setting and -grouting Epoxy and Water Cleanable Tile-setting Epoxy Adhesive	2103.10.3
A118.4-99	American National Standard Specifications for Latex-portland Cement Mortar	2103.10.2
A118.5-99	American National Standard Specifications for Chemical Resistant Furan Mortar and Grouts for Tile Installation	2103.10.4
A118.6-99	American National Standard Specifications for Cement Grouts for Tile Installation	2103.10.7
A118.8-99	American National Standard Specifications for Modified Epoxy Emulsion Mortar/Grout	2103.10.5
A136.1-99	American National Standard Specifications for Organic Adhesives for Installation of Ceramic Tile	2103.10.6
A137.1-88	American National Standard Specifications for Ceramic Tile	2103.5
A208.1-99	Particleboard	2303.1.7, 2303.1.7.1
<i>S3.41-90 (R2001)</i>	<i>American National Standard Audible Evacuation Signal</i>	<i>907.9.2.1</i>
Z 97.1-84 (R1994)	Safety Glazing Materials Used in Buildings—Safety Performance Specifications and Methods of Test (Reaffirmed 1994)	2306.1.2, 2406.1.2, 2409.1, 7-3094.2

REFERENCED STANDARDS

APA

APA - Engineered Wood Association
 P.O. Box 11700
 Tacoma, WA 98411-0700

Standard reference number	Title	Referenced in code section number
APA PDS-04	Panel Design Specification . . . . .	.2306.1, 2306.3.1, 2306.4.1
APA PDS Supplement 1-90	Design and Fabrication of Plywood Curved Panels (revised 1995) . . . . .	.2306.1
APA PDS Supplement 2-92	Design and Fabrication of Plywood-lumber beams (revised 1998) . . . . .	.2306.1
APA PDS Supplement 3-90	Design and Fabrication of Plywood Stressed-skin Panels (revised 1996) . . . . .	.2306.1
APA PDS Supplement 4-90	Design and Fabrication of Plywood Sandwich Panels (revised 1993) . . . . .	.2306.1
APA PDS Supplement 5-95	Design and Fabrication of All-plywood Beams (revised 1995) . . . . .	.2306.1
EWS R540-96	Builders Tips: Proper Storage and Handling of Glulam Beams . . . . .	.2306.1
EWS S475-01	Glued Laminated Beam Design Tables . . . . .	.2306.1
EWS S560-03	Field Notching and Drilling of Glued Laminated Timber Beams . . . . .	.2306.1
EWS T300-02	Glulam Connection Details . . . . .	.2306.1
EWS X440-00	Product Guide—Glulam . . . . .	.2306.1
EWS X450-01	Glulam in Residential Construction—Western Edition . . . . .	.2306.1

ASAE

American Society of Agricultural Engineers
 2950 Niles Road
 St. Joseph, MI 49085-9659

Standard reference number	Title	Referenced in code section number
EP 484.2 (1998)	Diaphragm Design of Metal-clad, Post-frame Rectangular Buildings . . . . .	.2306.1
EP 486.1 (2000)	Shallow-post Foundation Design . . . . .	.2306.1
EP 559 (1997)	Design Requirements and Bending Properties for Mechanically Laminated Columns . . . . .	.2306.1

ASCE/SEI

American Society of Civil Engineers
 Structural Engineering Institute
 1801 Alexander Bell Drive
 Reston, VA 20191-4400

Standard reference number	Title	Referenced in code section number
3-91	Structural Design of Composite Slabs	1604.3.3, 2209.2
5-05	Building Code Requirements for Masonry Structures	1405.5, 1405.5.2, 1405.9, 1604.3.4, 1704.5, 1704.5.1, Table 1704.5.1, 1704.5.2, 1704.5.3, Table 1704.5.3, 1708.1.1, 1708.1.2, 1708.1.3, 1708.1.4, 1805.5.2, 1812.7, 2101.2.2, 2101.2.3, 2101.2.4, 2101.2.5, 2101.2.6, 2103.1.3.6, 2106.1, 2106.1.1, 2106.1.1.1, 2106.1.1.2, 2106.1.1.3, 2106.3, 2106.4, 2106.5, 2106.6, 2107.1, 2107.2, 2107.3, 2107.4, 2107.5, 2107.6, 2107.7, 2107.8, 2108.1, 2108.2, 2108.3, 2108.4, 2109.1, 2109.2.3.1, 2109.7.3
6-05	Specifications for Masonry Structures	1405.5.1, Table 1704.5.1, Table 1704.5.3, 1805.5.2.2, 2103.13.7, 2104.1, 2104.1.1, 2104.3, 2104.4
7-05	Minimum Design Loads for Buildings and Other Structures including Supplement No. 1 and excluding Chapter 14 and Appendix 11A	1602.1, 1604.3, 1604.10, 1605.1, 1605.2.2, 1605.3.1.2, 1605.3.2, 1605.4, 1607.11.1, 1608.1, 1608.2, 1609.1.1, 1609.1.2, 1609.3, 1609.5.1, 1609.5.3, 1611.2, 1612.2, 1613.1, 1613.2, Table 1613.5.3(1), Table 1613.5.3(2), 1613.5.6, 1613.5.6.1, 1613.5.6.2, 1613.6, 1613.6.1, 1613.6.2, 1801.2.1, 1802.2.7, 2205.2.1, 2205.3, 2205.3.1, 2208.1, 2305.1.5, 2305.2.5, 2305.3.1, 2306.4.5, Table 2306.4.5, Table 2308.10.1
8-02	Standard Specification for the Design of Cold-formed Stainless Steel Structural Members	1604.3.3, 2209.1
19-96	Structural Applications of Steel Cables for Buildings	2207.1, 2207.2
24-05	Flood Resistant Design and Construction	1203.3.2, 1612.4, 1612.5, 3001.2
29-05	Standard Calculation Methods for Structural Fire Protection	721.1
32-01	Design and Construction of Frost Protected Shallow Foundations	1805.2.1
41-06	<i>Seismic Rehabilitation of Existing Buildings including Supplement No. 1</i>	3403.2.3, 3403A.13, 3415.5, 3415.6, 3415.8, 3417.2, 3417.5, 3417.7, 3417.9

CSSB

Cedar Shake and Shingle Bureau
P.O. Box 1178
Sumas, WA 98295-1178

Standard reference number	Title	Referenced in code section number
CSSB-97	Grading and Packing Rules for Western Red Cedar Shakes and Western Red Shingles of the Cedar Shake and Shingle Bureau	Table 1507.8.4, Table 1507.9.5

DASMA

Door and Access Systems Manufacturers Association International
1300 Summer Avenue
Cleveland, OH 44115-2851

Standard reference number	Title	Referenced in code section number
107-98 (03)	Room Fire Test Standard for Garage Doors Using Foam Plastic Insulation	2603.4.1.9

DOC

U.S. Department of Commerce
National Institute of Standards and Technology
100 Bureau Drive Stop 3460
Gaithersburg, MD 20899

Standard reference number	Title	Referenced in code section number
PS-1-95	Construction and Industrial Plywood	2303.1.4, 2304.6.2, Table 2304.7(4), Table 2304.7(5), 2306.3.1, Table 2306.3.1, Table 2306.3.2
PS-2-92	Performance Standard for Wood-based Structural-use Panels	2303.1.4, 2304.6.2, Table 2304.7(5), Table 2306.3.1, 2306.3.1, Table 2306.3.2
PS-20-99	American Softwood Lumber Standard	1809.1.1, 2302.1, 2303.1.1

DOL

U.S. Department of Labor
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

Standard reference number	Title	Referenced in code section number
29 CFR Part 1910.1000 (1974)	Air Contaminants . . . . .	.902.1

DOTn

U.S. Department of Transportation
c/o Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402-9325

Standard reference number	Title	Referenced in code section number
49 CFR-1998	Specification of Transportation of Explosive and Other Dangerous Articles, UN 0335, UN 0336 Shipping Containers	307.2
49 CFR Parts 173.137 (1990)	Shippers—General Requirements for Shipments and Packaging—Class 8—Assignment of Packing Group	307.2

FEMA

Federal Emergency Management Agency
Federal Center Plaza
500 C Street S.W.
Washington, DC 20472

Standard reference number	Title	Referenced in code section number
> FIA-TB11-01	Crawlspace Construction for Buildings Located in Special Flood Hazard Areas	1807.1.2.1

REFERENCED STANDARDS

Standard reference number	Title	Referenced
		in code section number
3011-99	<i>Approved Standard for Control Station Service for Fire Alarm and Protective Equipment Supervision.</i>	907.2.3.5
3260-00	<i>Radiant Energy-sensing Fire Detectors for Automatic Fire Alarm Signaling</i>	
4450 (1989)	Approval Standard for Class 1 Insulated Steel Deck Roofs— with Supplements through July 1992	1504.3.1, 1508.1, 2603.3, 2603.4.1.5
4470 (1992)	Approval Standard for Class 1 Roof Covers	1504.3.1, 1504.7
4880 (2001)	American National Standard for Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior and Exterior Finish Systems.	2603.4, 2603.9

Standard reference number	Title	Referenced
		in code section number
GA 216-04	Application and Finishing of Gypsum Board	Table 2508.1, 2509.2
GA 600-03	Fire-Resistance Design Manual, 17th Edition.	Table 720.1(1), Table 720.1(2), Table 720.1(3)

Standard reference number	Title	Referenced
		in code section number
HP-1-2000	The American National Standard for Hardwood and Decorative Plywood	2303.3, 2304.6.2

Standard reference number	Title	Referenced
		in code section number
ICC 300-02	ICC Standard on Bleachers, Folding and Telescopic Seating and Grandstands.	1025.1.1, 3401.1
ICC-ES AC 43-06	<i>Acceptance Criteria for Steel Deck Roof and Floor Systems</i>	1609A.3.7.2, 2209A.3
IEBC 2006	<i>International Existing Building Code</i>	3417.1.1, 3417.8
SBCCI SSTD 10-99	Standard for Hurricane Resistant Residential Construction	1609.1.1, 1609.1.1.1, 2308.2.1
SBCCI SSTD 11-97	Test Standard for Determining Wind Resistance of Concrete or Clay Roof Tiles	1715.2.1, 1715.2.2

Standard reference number	Title	Referenced
		in code section number
ISO 8115-86	Cotton Bales—Dimensions and Density	Table 415.8.2.1.1

PCI

Precast Prestressed Concrete Institute
175 W. Jackson Boulevard, Suite 1859
Chicago, IL 60604-9773

Standard reference number	Title	Referenced in code section number
MNL 124-89	Design for Fire Resistance of Precast Prestressed Concrete.	721.2.3.1
MNL 128-01	Recommended Practice for Glass Fiber Reinforced Concrete Panels	1903.2
PCI 120-04	PCI Design Handbook 6th Edition.	1908A.1

PTI

Post-Tensioning Institute
1717 W. Northern Avenue, Suite 114
Phoenix, AZ 85021

Standard reference number	Title	Referenced in code section number
PTI-2004	Standard Requirements for Analysis of Shallow Concrete Foundations on Expansive Soils, First Edition	1805.8.2
PTI-2004	Standard Requirements for Design of Shallow Post-tensioned Concrete Foundation on Expansive Soils.	1805.8.2
PTI-2004	Recommendations for Prestressed Rock and Soil Anchors (4th Edition).	1813A.2

RMI

Rack Manufacturers Institute
8720 Red Oak Boulevard, Suite 201
Charlotte, NC 28217

Standard reference number	Title	Referenced in code section number
RMI (2002)	Specification for Design, Testing and Utilization of Industrial Steel Storage Racks.	2208.1

SFM

State of California
Department of Forestry and Fire Protection
Office of the State Fire Marshal
P.O. Box 944246
Sacramento, CA 94246-2460

Standard reference number	Title	Referenced in code section number
12-3	Releasing Systems for Security Bars in Dwellings	
12-7-3	Fire-testing Furnaces	
12-7A-1	Exterior Wall Siding and Sheathing	
12-7A-2	Exterior Window	
12-7A-3	Under Eave	
12-7A-4	Decking	
12-8-100	Room Fire Tests for Wall and Ceiling Materials	
12-10-1	Power Operated Exit Doors	
12-10-2	Single Point Latching or Locking Devices	
12-10-3	Emergency Exit and Panic Hardware	
<i>(The Office of the State Fire Marshal standards referred to above are found in the California Code of Regulations, Title 24, Part 12.)</i>		

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Standard reference number	Title	Referenced in code section number
JG-1.1-05	Standard Specification for Joist Girders	1604.3.3, 2206.1
K-1.1-05	Standard Specification for Open Web Steel Joists, K-Series	1604.3.3, 2206.1
LH/DLH-1.1-05	Standard Specification for Longspan Steel Joists, LH Series and Deep Longspan Steel Joists, DLH Series	1604.3.3, 2206.1

HISTORY NOTE APPENDIX

CALIFORNIA BUILDING CODE

Title 24, Part 2, California Code of Regulations (CCR)

For prior history, see the History Note Appendix to the California Building Code, 2001 Triennial Edition effective November 1, 2002.

1. (BSC 01/06, BSC 06/06, DSA-AC 01/06, DSA-AC 02/06, DSA-SS 01/06, DSA-SS 02/06, HCD 04/06, OSHPD 02/06, OSHPD 03/06, OSHPD 04/06, SFM 05/06) Adoption by reference of the 2006 *International Building Code* with necessary state amendments and repeal of the 1997 edition of the *Uniform Building Code*. Filed with the Secretary of State on February 15, 2007 and effective on January 1, 2008.
2. Erratum to correct editorial errors in Chapter 1, Section 108.2.1.3. Chapter 1, Section 109.1.2.1. Chapter 2, Definitions - Matrix Adoption Table correction. Chapter 4, Section 430 - Article reference change. Chapter 5, Table 503. Chapter 5, Section 507.3. Chapter 11A, Section 1110A.2. Chapter 11A, Figure 11A-9D and 11A-9E out of order. Chapter 11A, Section 1121B.3.1 (8) (a), Chapter 11A, Section 1124A.3.2.1. Chapter 11A, Section 1143A.4. Chapter 11B, Section 1111B, 1115B.3, 1129B.4, 1133B.4.5.3, 1133B.7.1.3 and Figure 11B-11. Chapter 12, Matrix Adoption Table. Chapter 12, Section 1250.1 and 1250.4. Chapter 15, Section 1511.1. Chapter 16A, Section 1614A.1.13. Chapter 17A, Section 1714A.5.2. Chapter 18, Matrix Adoption Tables. Chapter 29, Fixture Table 2902.1. Chapter 31, Section 3109.4.4.2 through 3109.4.4.8. Chapter 31A - Clarify reference to Title 8 for provisions. Chapter 35, NFPA 13-02. Appendix Chapter 1, Section 101.4.2, 101.4.5, 102.6 and 103.3.
3. (SFM EF 02/07) Amend Chapter 7A, Section 701A.3.2 to clarify the dates established for State Responsibility Areas as January 1, 2008 and Local Agency Very-High Fire Hazard Severity Zones as July 1, 2008 filed with Secretary of State on September 27, 2007, effective January 1, 2008.
4. (OSHPD EF 01/07) Amend Chapters 16A, 17A, 18A, 22A, 34 and 34A to incorporate the ASCE 41-06, Seismic Rehabilitation of Existing Buildings as a referenced standard. Repeal FEMA 356, relocate necessary amendments of FEMA 356 into the ASCE 41-06. Amend by adopting the PTI-2004-4th edition. Incorporation of an advisory issued by AISG to require Steel Concentric Braced Frame (SCBF) based on Hollow Structural Steel Sections (HSS).

