ANALYSIS

This ordinance adds new Title 30 - Residential Code to the Los Angeles County Code. Title 30 incorporates by reference portions of the 2010 California Residential Code, published by the California Building Standards Commission, with certain changes and modifications.

State law requires that the County adopt ordinances that contain the same requirements as are contained in the building standards published in the California Residential Code. State law allows the County to change or modify these requirements only if it determines that such changes or modifications are reasonably necessary because of local climatic, geological, or topographical conditions.

The changes and modifications to requirements contained in the building standards published in the 2010 California Residential Code which are contained in this ordinance are based upon express findings, contained in the ordinance, that such changes are reasonably necessary due to local climatic, geological, or topographical conditions.

Title 30 also incorporates by reference certain administrative provisions contained in Title 26 - Building Code.

ANDREA SHERIDAN ORDIN
County Counsel

By
MARK T. YANAI
Principal Deputy County Counsel
Property Division

MTY:vn

03/10/10 (Requested)

10/18/10 (Revised)

ORDINANCE NO. _____

An ordinance adding Title 30 – Residential Code to the Los Angeles County Code, relating to the adoption of the 2010 California Residential Code by reference, with certain changes and modifications.

The Board of Supervisors of the County of Los Angeles ordains as follows:

SECTION 1. Title 30 is hereby added to read as follows:

TITLE 30

RESIDENTIAL CODE

CHAPTER 1

ADMINISTRATION

R100 ADOPTION BY REFERENCE

Except as hereinafter changed or modified, Sections 102 through 119 of Chapter 1, Section 1207 of Chapter 12, Chapters 34, 67, 69, 98, 99, and Appendix J of Title 26 of the Los Angeles County Code are adopted by reference and incorporated into this Title 30 as if fully set forth below, and shall be known as Sections 102 through 119 of Chapter 1, Section 1207 of Chapter 12, Chapters 34, 67, 69, 98, 99, and Appendix J of Title 30 of the Los Angeles County Code.

Except as hereinafter changed or modified, Chapters 2 through 10, Chapter 44, and Appendix H of that certain code known and designated as the 2010 California Residential Code as published by the California Building Standards Commission are adopted by reference and incorporated into this Title 30 as if fully set forth below, and

shall be known as Chapters 2 through 10, Chapter 44, and Appendix H of Title 30 of the Los Angeles County Code.

A copy of the 2010 California Residential Code shall be at all times maintained by the Building Official for use and examination by the public.

R101 TITLE, PURPOSE, AND INTENT

R101.1 Title. Title 30 of the Los Angeles County Code shall be known as the "Residential Code For One And Two Family Dwellings," may be cited as such, and will be referred to herein as "these regulations" or "these building standards" or "this Code."

R101.2 Purpose and Intent. The purpose of this Code is to provide minimum standards to preserve the public safety, health, and welfare by regulating the design, construction, installation, quality of materials, use, occupancy, location, and maintenance of all buildings, structures, grading, and certain equipment as specifically set forth herein. Consistent with this purpose, the provisions of this Code are intended to confer a benefit on the community as a whole and are not intended to establish a duty of care toward any particular person.

This Code shall not be construed to hold the County of Los Angeles or any officer, employee, or agent thereof responsible for any damage to persons or property by reason of any inspection authorized herein or by reason of the issuance or non-issuance of any permit authorized herein, and/or for any action or omission in connection with the application and/or enforcement of this Code. By adopting the provisions of this Code, the County does not intend to impose on itself, its employees,

or agents any mandatory duties of care toward persons and property within its jurisdiction so as to provide a basis of civil liability for damages.

This Section is declaratory of existing law and is not to be construed as suggesting that such was not the purpose and intent of previous Code adoptions.

R101.3 Scope. The provisions of this Code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal, demolition, and grading of detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress and their accessory structures within the unincorporated territory of the County of Los Angeles and to such work or use by the County of Los Angeles in any incorporated city.

Exception: Live/work units complying with the requirements of Section 419 of Title 26 of the Los Angeles County Building Code shall be permitted to be built as one- and two-family dwellings or townhouses. Fire suppression otherwise required by Section 419.5 of Title 26 of the Los Angeles County Building Code for buildings and structures constructed under this Code shall conform to Section 903.3.1.3 of Title 26 of the Los Angeles County Building Code.

Additions, alterations, repairs, and changes of use or occupancy in all buildings and structures to which this Title 30 applies shall comply with the provisions for new buildings and structures except as otherwise provided in Section 109 and Chapter 34 of Title 26 of the Los Angeles County Building Code.

R101.4 APPLICABILITY

R101.4.1 General.

Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where, in any specific case, different Sections of this Code specify different materials, methods of construction, or other requirements, the most restrictive shall govern.

R101.4.2 Other laws.

The provisions of this Code shall not be deemed to nullify any provisions of local, state, or federal law.

R101.4.3 Referenced codes and standards.

The codes and standards referenced in this Code shall be considered part of the requirements of this Code to the prescribed extent of each such reference. Where differences occur between provisions of this Code and referenced codes and standards, the provisions of this Code shall apply.

SECTION 2. Section R301.1.3.2 is hereby amended to read as follows:

R301.1.3.2 Woodframe structures ~~greater than two-stories~~.

The ~~b~~Building ~~o~~Official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of woodframe construction more than two stories and basement in height located in Seismic Design Category A, B, or C. Notwithstanding other sections, the law establishing these provisions is found in Business and Professions Code sections 5537 and 6737.1.

The Building Official shall require construction documents to be approved and stamped by a California licensed architect or engineer for all dwellings of wood frame construction more than one story in height or with a basement located in Seismic Design Category D_0, D_1, or D_2.

SECTION 3. Section R301.1.4 is hereby added to read as follows:

R301.1.4 Seismic design provisions for buildings constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope).

The design and construction of new buildings and additions to existing buildings when constructed on or into slopes steeper than one unit vertical in three units horizontal (33.3 percent slope) shall comply with Section 1613.9 of the 2011 County of Los Angeles Building Code.

SECTION 4. Section R301.2 is hereby amended to read as follows:

R301.2 Climatic and geographic design criteria.

Buildings shall be constructed in accordance with the provisions of this Code as limited by the provisions of this ~~s~~Section. ~~Additional criteria shall be established by the local jurisdiction and set forth~~Consult with the Building Official regarding additional criteria in Table R301.2(1).

SECTION 5. Section R301.2.2.2.5 is amended to read as follows:

R301.2.2.2.5 Irregular buildings.

. . .

1. When exterior shear wall lines or braced wall panels are not in one plane vertically from the foundation to the uppermost story in which they are required.

~~**Exception:** For wood light-frame construction, floors with cantilevers or setbacks not exceeding four times the nominal depth of the wood floor joists are permitted to support braced wall panels that are out of plane with braced wall panels below provided that:~~

~~1. Floor joists are nominal 2 inches by 10 inches (51 mm by 254 mm) or larger and spaced not more than 16 inches (406 mm) on center.~~

~~2. The ratio of the back span to the cantilever is at least 2 to 1.~~

~~3. Floor joists at ends of braced wall panels are doubled.~~

~~4. For wood-frame construction, a continuous rim joist is connected to ends or all cantilever joists. When spliced, the rim joists shall be spliced using a galvanized metal tie not less than 0.058 inch (1.5 mm) (16 gage) and 11/2 inches (38 mm) wide fastened with six 16d nails on each side of the splice or a block of the same size as the rim joist of sufficient length to fit securely between the joist space at which the splice occurs fastened with eight 16d nails on each side of the splice; and~~

~~5. Gravity loads carried at the end of cantilevered joists are limited to uniform wall and roof loads and the reactions from headers having a span of 18 feet (2438 mm) or less.~~

2. When a section of floor or roof is not laterally supported by shear walls or braced wall lines on all edges.

Exception: Portions of floors that do not support shear walls or braced wall panels above, or roofs, shall be permitted to extend no more than six feet (1829 mm) beyond a shear wall or braced wall line.

3. When the end of a braced wall panel occurs over an opening in the wall below and ends at a horizontal distance greater than 1 foot (305 mm) from the edge of the opening. This provision is applicable to shear walls and braced wall panels offset in plane and to braced wall panels offset out of plane as permitted by the exception to item 1 above.

~~**Exception:** For wood light-frame wall construction, one end of a braced wall panel shall be permitted to extend more than one foot (305 mm) over an opening not more than 8 feet (2438 mm) wide in the wall below provided that the opening includes a header in accordance with the following:~~

~~1. The building width, loading condition and framing member species limitations of Table R502.5(1) shall apply; and~~

~~2. Not less than one 2x12 or two 2x10 for an opening not more than 4 feet (1219 mm) wide; or~~

~~3. Not less than two 2x12 or three 2x10 for an opening not more than 6 feet (1829 mm) wide; or~~

~~4. Not less than three 2x12 or four 2x10 for an opening not more than 8 feet (2438 mm) wide; and~~

~~5. The entire length of the braced wall panel does not occur over an opening in the wall below.~~

4. When an opening in a floor or roof exceeds the lesser of 12 feet (3658 mm) or 50 percent of the least floor or roof dimension.

5. When portions of a floor level are vertically offset.

~~**Exceptions:**~~

~~1. Framing supported directly by continuous foundations at the perimeter of the building.~~

~~2. For wood light-frame construction, floors shall be permitted to be vertically offset when the floor framing is lapped or tied together as required by section R502.6.1.~~

. . .

SECTION 6. Section R301.2.2.3.5.1 is hereby added to read as follows:

R301.2.2.3.5.1 AISI S230, Section B1. (Modify AISI S230, Section B1 to read as follows:)

Where No. 8 screws are specified, the required number of screws in a steel-to-steel connection shall be permitted to be reduced in accordance with the reduction factors in Table B1-1 when larger screws are used or when the sheets of steel being connected are thicker than 33 mils (0.84 mm). When applying the reduction factor, the resulting number of screws shall be rounded up.

SECTION 7. Section R322.1.4.1 is hereby amended to read as follows:

R322.1.4.1 Determination of design flood elevations.

. . .

2. Determine the design flood elevation in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a registered ~~design professional~~civil engineer who shall determine that the technical methods used reflect currently accepted engineering practice. Studies, analyses, and computations shall be submitted in sufficient detail to allow thorough review and approval.

SECTION 8. Section R322.2.2 is hereby amended to read as follows:

R322.2.2 Enclosed area below design flood elevation. Enclosed areas for attached and detached building and structures, including crawl spaces, that are below the design flood elevation shall:

. . .

SECTION 9. Section R327 is hereby amended to read as follows:

SECTION R327

MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE

NOTE: This Chapter has been amended by Los Angeles County and is applicable to all occupancy groups.

SECTION 10. Section R327.1.1 is hereby amended to read as follows:

R327.1.1 Scope.

This ~~c~~Chapter applies to building materials, systems, and or assemblies used in the exterior design and construction of new buildings, and to additions, alterations, or repairs made to existing buildings, erected, constructed, located, or moved within a Wildland-Urban Interface Fire Area as defined in Section R327.2.

SECTION 11. Section R327.1.3 is hereby amended to read as follows:

R327.1.3. Application.

New buildings, and any additions, alterations, or repairs made to existing buildings located in or moved within any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland-Urban Interface Fire Area designated by the ~~enforcing agency~~Los Angeles County Fire Department constructed after the application date shall comply with the provisions of this ~~c~~Chapter.

Exceptions:

. . .

~~4. Additions to and remodels of buildings originally constructed prior to the applicable application date~~.

SECTION 12. Section R327.1.3.1 is hereby amended to read as follows:

R327.1.3.1 Application date and where required.

New buildings for which an application for a building permit is submitted on or after July 1, 2008, and any additions, alterations, or repairs made to existing buildings for which an application for a building permit is submitted on or after January 1, 2011,

located in any Fire Hazard Severity Zone or Wildland Interface Fire Area shall comply with all ~~s~~Sections of this ~~c~~Chapter, including all of the following areas:

. . .

Exceptions:

1. ~~New b~~Buildings located in any Fire Hazard Severity Zone within State Responsibility Areas, for which an application for a building permit is submitted on or after January 1, 2008, shall comply with all ~~s~~Sections of this ~~c~~Chapter.

2. ~~New b~~Buildings located in any Fire Hazard Severity Zone within State Responsibility Areas or any Wildland Interface Fire Area designated by cities and other local agencies for which an application for a building permit is submitted on or after December 1, 2005, but prior to July 1, 2008, shall only comply with the following ~~s~~Sections of this ~~c~~Chapter:

. . .

SECTION 13. Section R327.1.4 is hereby amended to read as follows:

R327.1.4 Inspection and certification.

. . .

1. Building permit issuance. The ~~local b~~Building ~~o~~Official shall, prior to construction, provide the owner or applicant a certification that the building as proposed to be built complies with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this Chapter. Issuance of a building permit by the ~~local b~~Building ~~o~~Official for the proposed building shall be considered as complying with this ~~s~~Section.

2. Building permit final. The ~~local b~~Building ~~o~~Official shall, upon completion of construction, provide the owner or applicant with a copy of the final inspection report that demonstrates the building was constructed in compliance with all applicable state and local building standards, including those for materials and construction methods for wildfire exposure as described in this Chapter. Issuance of a certificate of occupancy by the ~~local b~~Building ~~o~~Official for the proposed building shall be considered as complying with this ~~s~~Section.

SECTION 14. Section R327.2 is hereby amended to read as follows:

SECTION R327.2

DEFINITIONS

. . .

FIRE PROTECTION PLAN is a document prepared for a specific project or development proposed for a Wildland-Urban Interface Fire Area. It describes ways to minimize and mitigate potential for loss from wildfire exposure. The Fire Protection Plan shall be in accordance with this ~~c~~Chapter and the ~~California~~Los Angeles County Fire Code Title 32, Chapter 49. When required by the enforcing agency for the purposes of granting modifications, a fire protection plan shall be submitted. ~~Only locally adopted ordinances that have been filed with the California Building Standards Commission or the Department of Housing and Community Development in accordance with Section 1.1.8 shall apply.~~

FIRE HAZARD SEVERITY ZONES are geographical areas designated pursuant to California Public Resources Code ~~S~~sections 4201 through 4204 and classified as

Very High, High, or Moderate in State Responsibility Areas or as Local Agency Very High Fire Hazard Severity Zones designated pursuant to California Government Code sections 51175 through 51189. See ~~California~~Los Angeles County Fire Code, ~~Article 86~~Chapter 49.

. . .

HEAVY TIMBER. A type of construction classification specified in Section 602 of the ~~California~~Los Angeles County Building Code. For use in this Chapter, heavy timber shall be sawn lumber or glue laminated wood with the smallest minimum nominal dimension of 4 inches (102 mm). Heavy Timber walls or floors shall be sawn or glue-laminated planks splined, tongue-and-grove, or set close together and well spiked.

. . .

WILDLAND-URBAN INTERFACE FIRE AREA is a geographical area identified by the state as a "Fire Hazard Severity Zone" in accordance with the Public Resources Code ~~S~~sections 4201 through 4204 and Government Code ~~S~~sections 51175 through 51189, or other areas designated by the ~~enforcing agency~~Los Angeles County Fire Department to be at a significant risk from wildfires.

SECTION 15. Section R327.3.2 is hereby amended to read as follows:

R327.3.2 Qualification by testing.

Material and material assemblies tested in accordance with the requirements of Section R327.3 shall be accepted for use when the results and conditions of those tests are met. Product evaluation testing of material and material assemblies shall be

approved or listed by the State Fire Marshal, the Building Official or identified in a current report issued by an approved agency.

SECTION 16. Section R327.3.3 is hereby amended to read as follows:

R327.3.3 Approved agency.

Product evaluation testing shall be performed by an approved agency as defined in Section 1702 of the ~~California~~Los Angeles County Building Code. The scope of accreditation for the approved agency shall include building product compliance with ~~e~~Code.

SECTION 17. Section R327.3.5.2 is hereby amended to read as follows:

R327.3.5.2 Weathering.

Fire-retardant-treated wood ~~and Fire-retardant-treated wood shingles and shakes~~ shall meet the fire test performance requirements of this Chapter after being subjected to the weathering conditions contained in the following standards, as applicable to the materials and the conditions of use.

SECTION 18. Section R327.3.5.2.1 is hereby amended to read as follows:

R327.3.5.2.1 Fire-retardant-treated wood.

Fire-retardant-treated wood shall be tested in accordance with ASTM D2898, "Standard Practice for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing (Method A)" and the requirements of ~~s~~Section 2303.2 of the ~~California~~Los Angeles County Building Code.

SECTION 19. Section R327.3.5.2.2 is hereby deleted in its entirety.

~~**R327.3.5.2.2 Fire-retardant-treated wood shingles and shakes.** Fire-retardant-treated wood shingles and shakes shall be approved and listed by the State Fire Marshal in accordance with Section 208(c), Title 19 California Code of Regulations.~~

SECTION 20. Section R327.3.6 is hereby amended to read as follows:

R327.3.6 Alternates for materials, design, tests, and methods of construction.

The enforcing agency is permitted to modify the provisions of this ~~c~~Chapter for site-specific conditions in accordance with Chapter 1, Section ~~1.11.2.4~~104.2.7. When required by the ~~enforcing agency~~Building Official for the purposes of granting modifications, a fire protection plan shall be submitted in accordance with the ~~California~~Los Angeles County Fire Code, Chapter 49.

SECTION 21. Section R327.4.3 is hereby amended to read as follows:

R327.4.3 Alternative methods for determining Ignition-resistant material.

. . .

2. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use that complies with the requirements of ~~s~~Section 2303.2 of the ~~California~~Los Angeles County Building Code.

~~3. Fire-retardant-treated wood shingles and shakes. Fire-retardant-treated wood shingles and shakes, as defined in section 1505.6 and listed by State Fire~~

~~Marshal for use as "Class B" roof covering, shall be accepted as an Ignition-resistant wall covering material when installed over solid sheathing.~~

SECTION 22. Section R327.5.2. is hereby amended to read as follows:

R327.5.2 Roof coverings.

Roof coverings shall be Class A as specified in Section 1505.2. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be firestopped with approved materials or have one layer of minimum 72 pounds (32.4 kg) mineral-surfaced non-perforated cap sheet complying with ASTM D 3909 installed over the combustible decking. Wood shingles and wood shakes are prohibited in any Fire Hazard Severity Zones regardless of classification.

SECTION 23. Section R327.6.1 is hereby amended to read as follows:

R327.6.1 General.

Where provided, ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation shall be in accordance with Section 1203 of the ~~California~~Los Angeles County Building Code and ~~s~~Sections R327.6.1 through R327.6.3 of this ~~s~~Section to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

SECTION 24. Section R327.6.3 is hereby amended to read as follows:

. . .

Exceptions:

1. The ~~enforcing agency~~Building Official may accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.

2. Vents complying with the requirements of Section R327.6.2 may be installed on the underside of eaves and cornices in accordance with either one of the following conditions:

2.1. The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 of the ~~California~~Los Angeles County Building Code or,

. . .

SECTION 25. Section R327.10.2 is hereby amended to read as follows:

R327.10.2 Applicability.

. . .

Exceptions:

. . .

2. Awnings and canopies shall comply with the requirements of Section 3105 of the ~~California~~Los Angeles County Building Code.

SECTION 26. Section R327.10.3.2 is hereby amended to read as follows:

R327.10.3.2 When required by the ~~enforcing agency~~Building Official, detached accessory structures within 50 feet of an applicable building shall comply with the requirements of this ~~s~~Section.

SECTION 27. Section R327.10.4 is hereby amended to read as follows:

R327.10.4. Requirements.

When required by the ~~enforcing agency~~Building Official, accessory structures shall be constructed of noncombustible or ignition-resistant materials.

SECTION 28. Section R401.1 is hereby amended to read as follows:

R401.1 Application.

. . .

Wood foundations in Seismic Design Category D_0, D_1, or D_2 shall ~~be designed in accordance with accepted engineering practice~~not be permitted.

Exception: In non-occupied, single-story, detached storage sheds and similar uses other than carport or garage, provided the gross floor area does not exceed 200 square feet, the plate height does not exceed 12 feet in height above the grade plane at any point, and the maximum roof projection does not exceed 24 inches.

SECTION 29. Section R403.1.2 is hereby amended to read as follows:

R403.1.2 Continuous footing in Seismic Design Categories D_0, D_1, and D_2.

The braced wall panels at exterior walls of buildings located in Seismic Design Categories D_0, D_1, and D_2 shall be supported by continuous footings. All required interior braced wall panels in buildings ~~with plan dimensions greater than 50 feet (15240 mm)~~ shall ~~also~~ be supported by continuous footings.

SECTION 30. Section R403.1.3 is hereby amended to read as follows:

R403.1.3 Seismic reinforcing.

. . .

Exception: In detached one- and two-family dwellings located in Seismic Design Category A, B, or C which are three stories or less in height and constructed with stud bearing walls, plain concrete footings without longitudinal reinforcement supporting walls, and isolated plain concrete footings supporting columns or pedestals are permitted.

SECTION 31. Section R403.1.5 is hereby amended to read as follows:

R403.1.5 Slope.

The top surface of footings shall be level. The bottom surface of footings shall be permitted to have a slope not exceeding one unit vertical in 10 units horizontal (10-percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground slopes more than one unit vertical in 10 units horizontal (10-percent slope).

For structures located in Seismic Design Categories D_0, D_1, or D_2, stepped footings shall be reinforced with two No. 4 deformed reinforcing bars located at the top and bottom of the footings as shown in Figure R403.1.5.

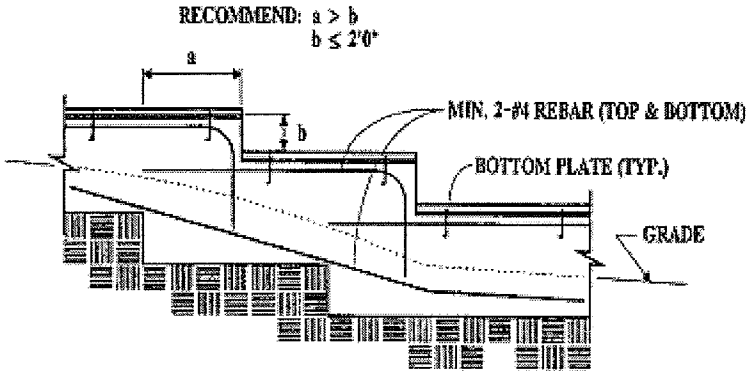


FIGURE R403.1.5

STEPPED FOOTING

SECTION 32. Section R404.2 is hereby amended to read as follows:

R404.2 Wood foundation walls.

Wood foundation walls shall be constructed in accordance with the provisions of Sections R404.2.1 through R404.2.6 and with the details shown in Figures R403.1(2) and R403.1(3). Wood foundation walls shall not be used for structures located in Seismic Design Category D_0, D_1, or D_2.

SECTION 33. Section R501.1 is hereby amended to read as follows:

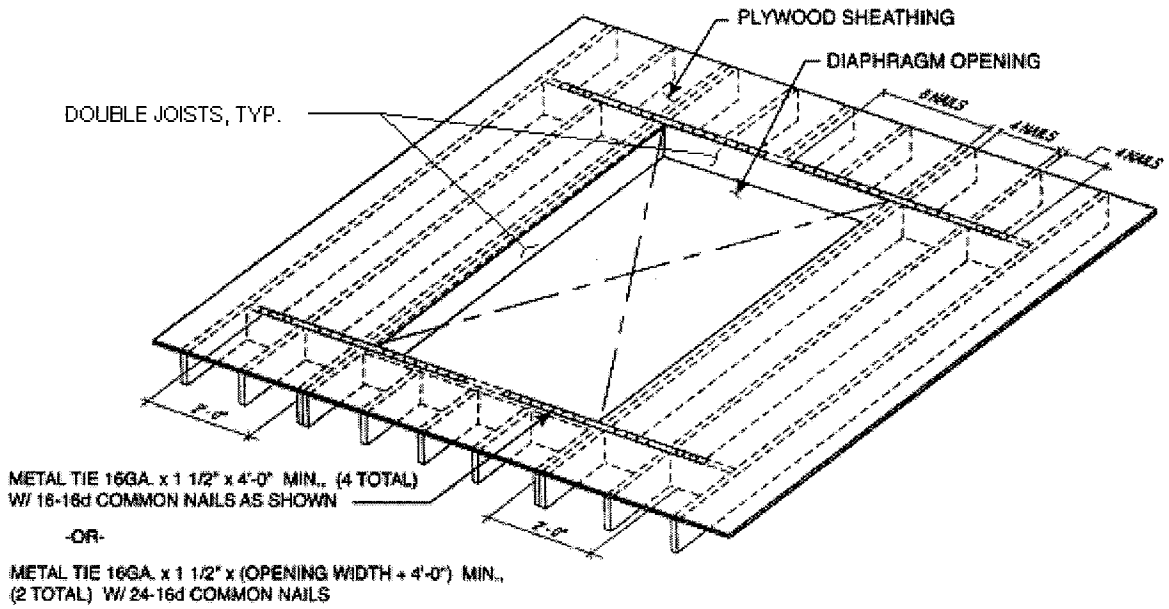
R501.1 Application.

The provision of this ~~c~~Chapter shall control the design and construction of the floors for all buildings including the floors of attic spaces used to house mechanical or plumbing fixtures and equipment weighing less than 400 pounds and maximum height of 4 feet above the floor or attic level.

SECTION 34. Section R503.2.4 is hereby added to read as follows:

R503.2.4 Openings in horizontal diaphragms.

Openings in horizontal diaphragms with a dimension perpendicular to the joist that is greater than 4 feet (1.2 m) shall be constructed in accordance with Figure R503.2.4.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Figure R503.2.4

a. Blockings shall be provided beyond headers.

b. Metal ties not less than 0.058 inch [1.47 mm (16 galvanized gage)] by 1.5 inches (38 mm) wide with eight 16d common nails on each side of the header-joist intersection. The metal ties shall have a minimum yield of 33,000 psi (227 MPa).

c. Openings in diaphragms shall be further limited in accordance with Section R301.2.2.2.5.

SECTION 35. Section R602.3.2 is hereby amended to read as follows:

R602.3.2 Top plate.

. . .

Exception: In other than Seismic Design Category D_0, D_1, or D_2, a~~A~~ single top plate may be installed in stud walls, provided the plate is adequately tied at joints, corners and intersecting walls by a minimum 3-inch-by-6-inch by a 0.036-inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.

SECTION 36. Table R602.3(1) is hereby amended to read as follows:

TABLE R602.3(1)

FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a, b, c]	SPACING OF FASTENERS
	Roof		
1	Blocking between joists or rafters to top plate, toe nail	3-8d ($2^1/_2$″ × 0.113″)	—
2	Ceiling joists to plate, toe nail	3-8d ($2^1/_2$″ × 0.113″)	—
3	Ceiling joists not attached to parallel rafter, laps over partitions, face nail	3-10d	—
4	Collar tie rafter, face nail or $1^1/_4$″ × 20 gage ridge strap	3-10d (3″ × 0.128″)	—
5	Rafter to plate, toe nail	2-16d ($3^1/_2$″ × 0.135″)	—
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	 4-16d ($3^1/_2$″ × 0.135″) 3-16d ($3^1/_2$″ × 0.135″)	 — —
	Wall		
7	Built-up corner studs	10d (3″ × 0.128″)	24″ o.c.
8	Built-up header, two pieces with $^1/_2$″ spacer	16d ($3^1/_2$″ × 0.135″)	16″ o.c. along each edge
9	Continued header, two pieces	16d ($3^1/_2$″ × 0.135″)	16″ o.c. along each edge
10	Continuous header to stud, toe nail	4-8d ($2^1/_2$″ × 0.113″)	—
11	Double studs, face nail	10d (3″ × 0.128″)	24″ o.c.
12	Double top plates, face nail	10d (3″ × 0.128″)	24″ o.c.
13	Double top plates, minimum 48-inch offset of end joints, face nail in lapped area	8-16d ($3^1/_2$″ × 0.135″)	—
14	Sole plate to joist or blocking, face nail	16d ($3^1/_2$″ × 0.135″)	16″ o.c.
15	Sole plate to joist or blocking at braced wall panels	3-16d ($3^1/_2$″ × 0.135″)	16″ o.c.
16	Stud to sole plate, toe nail	3-8d ($2^1/_2$″ × 0.113″) or 2-16d $3^1/_2$″ × 0.135″)	— —
17	Top or sole plate to stud, end nail	2-16d ($3^1/_2$″ × 0.135″)	—
18	Top plates, laps at corners and intersections, face nail	2-10d (3″ × 0.128″)	—
19	1″ brace to each stud and plate, face nail	2-8d ($2^1/_2$″ × 0.113″) 2 staples $1^3/_4$″	— —
20	1″ × 6″ sheathing to each bearing, face nail	2-8d ($2^1/_2$″ × 0.113″) 2 staples $1^3/_4$″	— —
21	1″ × 8″ sheathing to each bearing, face nail	2-8d ($2^1/_2$″ × 0.113″) 3 staples $1^3/_4$″	— —
22	Wider than 1″ × 8″ sheathing to each bearing, face nail	3-8d ($2^1/_2$″ × 0.113″) 4 staples $1^3/_4$″	— —
	Floor		
23	Joist to sill or girder, toe nail	3-8d ($2^1/_2$″ × 0.113″)	—
24	1″ × 6″ subfloor or less to each joist, face nail	2-8d ($2^1/_2$″ × 0.113″) 2 staples $1^3/_4$″	— —
25	2″ subfloor to joist or girder, blind and face nail	2-16d ($3^1/_2$″ × 0.135″)	—
26	Rim joist to top plate, toe nail (roof applications also)	8d ($2^1/_2$″ × 0.113″)	6″ o.c.
27	2″ planks (plank & beam – floor & roof)	2-16d ($3^1/_2$″ × 0.135″)	at each bearing
28	Built-up girders and beams, 2-inch lumber layers	10d (3″ × 0.128″)	Nail each layer as follows: 32″ o.c. at top and bottom and staggered. Two nails at ends and at each splice.
29	Ledger strip supporting joists or rafters	3-16d ($3^1/_2$″ × 0.135″)	At each joist or rafter

(continued)

TABLE R602.3(1)—continued
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER[b, c, e]	SPACING OF FASTENERS	
			Edges (inches)[i]	Intermediate supports[c, e] (inches)
Wood structural panels, subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing				
30	$^{3}/_{8}$" - $^{1}/_{2}$"	6d common (2" × 0.113") nail (subfloor wall)[j] 8d common (2$^{1}/_{2}$" × 0.131") nail (roof)	6	12[g]
31	$^{5}/_{16}$" - $^{1}/_{2}$"	6d common (2" × 0.113") nail (subfloor, wall) 8d common (2$^{1}/_{2}$" × 0.131") nail (roof)[f]	6	12[g]
32	$^{19}/_{32}$" - 1"	8d common nail (2$^{1}/_{2}$" × 0.131")	6	12[g]
33	1$^{1}/_{8}$" - 1$^{1}/_{4}$"	10d common (3" × 0.148") nail or 8d (2$^{1}/_{2}$" × 0.131") deformed nail	6	12
Other wall sheathing[h]				
34	$^{1}/_{2}$" structural cellulosic fiberboard sheathing	$^{1}/_{2}$" galvanized roofing nail, $^{7}/_{16}$" crown or 1" crown staple 16 ga., 1$^{1}/_{4}$" long	3	6
35	$^{25}/_{32}$" structural cellulosic fiberboard sheathing	1$^{3}/_{4}$" galvanized roofing nail, $^{7}/_{16}$" crown or 1" crown staple 16 ga., 1$^{1}/_{2}$" long	3	6
36[i]	$^{1}/_{2}$" gypsum sheathing[d]	1$^{1}/_{2}$" galvanized roofing nail; staple galvanized, 1$^{1}/_{2}$" long; 1$^{1}/_{4}$ screws, Type W or S	7	7
37[i]	$^{5}/_{8}$" gypsum sheathing[d]	1$^{3}/_{4}$" glavanized roofing nail; staple galvanized, 1$^{5}/_{8}$" long; 1$^{5}/_{8}$" screws, Type W or S	7	7
Wood structural panels, combination subfloor underlayment to framing				
38	$^{3}/_{4}$" and less	6d deformed (2" × 0.120") nail or 8d common (2$^{1}/_{2}$" × 0.131") nail	6	12
39	$^{7}/_{8}$" - 1"	8d common (2$^{1}/_{2}$" × 0.131") nail or 8d deformed (2$^{1}/_{2}$" × 0.120") nail	6	12
40	1$^{1}/_{8}$" - 1$^{1}/_{4}$"	10d common (3" × 0.148") nail or 8d deformed (2$^{1}/_{2}$" × 0.120") nail	6	12

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1ksi = 6.895 MPa.

a. All nails are smooth-common, box or deformed shanks except where otherwise stated. Nails used for framing and sheathing connections shall have minimum average bending yield strengths as shown: 80 ksi for shank diameter of 0.192 inch (20d common nail), 90 ksi for shank diameters larger than 0.142 inch but not larger than 0.177 inch, and 100 ksi for shank diameters of 0.142 inch or less.

b. Staples are 16 gage wire and have a minimum $^{7}/_{16}$-inch on diameter crown width.

c. Nails shall be spaced at not more than 6 inches on center at all supports where spans are 48 inches orgreater.

d. Four-foot-by-8-foot or 4-foot-by-9-foot panels shall be applied vertically.

e. Spacing of fasteners not included in this table shall be based on Table R602.3(2).

f. For regions having basic wind speed of 110 mph or greater, 8d deformed (2$^{1}/_{2}$" × 0.120) nails shall be used for attaching plywood and wood structural panel roof sheathing to framing within minimum 48-inch distance from gable end walls, if mean roof height is more than 25 feet, up to 35 feet maximum.

g. For regions having basic wind speed of 100 mph or less, nails for attaching wood structural panel roof sheathing to gable end wall framing shall be spaced 6 inches on center. When basic wind speed is greater than 100 mph, nails for attaching panel roof sheathing to intermediate supports shall be spaced 6 inches on center for minimum 48-inch distance from ridges, eaves and gable end walls; and 4 inches on center to gable end wall framing.

h. Gypsum sheathing shall conform to ASTM C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.

i. Spacing of fasteners on floor sheathing panel edges applies to panel edges supported by framing members and required blocking and at all floor perimeters only. Spacing of fasteners on roof sheathing panel edges applies to panel edges supported by framing members and required blocking. Blocking of roof or floor sheathing panel edges perpendicular to the framing members need not be provided except as required by other provisions of this code. Floor perimeter shall be supported by framing members or solid blocking.

j. Use of staples in braced wall panels shall be prohibited in Seismic Design Category D0, D1, or D2.

SECTION 37. Table R602.3(2) is hereby amended to read as follows:

TABLE R602.3(2)

ALTERNATE ATTACHMENTS

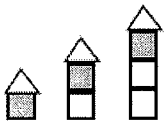
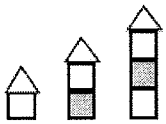
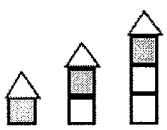
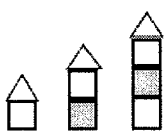
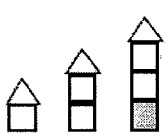
. . .

b. Staples shall have a minimum crown width of 7/16-inch on diameter except as noted. Use of staples in roof, floor, subfloor, and braced wall panels shall be prohibited in Seismic Design Category D_0, D_1, or D_2.

. . .

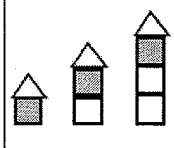
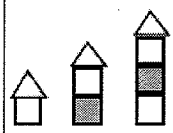
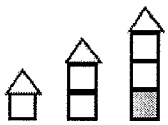
SECTION 38. Table R602.10.1.2(2) is hereby amended to read as follows:

TABLE R602.10.1.2(2)[a,b,c]
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY
(AS A FUNCTION OF BRACED WALL LINE LENGTH)

SOIL CLASS D[a] WALL HEIGHT = 10 FT 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING ≤ 25 FT			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE			
Seismic Design Category (SDC)	Story Location	Braced Wall Line Length	Method LIB	Methods [d] DWB, SFB, GB, PBS, PCP, HPS	Method WSP	Continuous Sheathing
SDC A and B and Detached Dwellings in C		Exempt from Seismic Requirements Use Table R602.10.1.2(1) for Bracing Requirements				
SDC C		10	2.5	2.5	1.6	1.4
		20	5.0	5.0	3.2	2.7
		30	7.5	7.5	4.8	4.1
		40	10.0	10.0	6.4	5.4
		50	12.5	12.5	8.0	6.8
		10	NP	4.5	3.0	2.6
		20	NP	9.0	6.0	5.1
		30	NP	13.5	9.0	7.7
		40	NP	18.0	12.0	10.2
		50	NP	22.5	15.0	12.8
		10	NP	6.0	4.5	3.8
		20	NP	12.0	9.0	7.7
		30	NP	18.0	13.5	11.5
		40	NP	24.0	18.0	15.3
		50	NP	30.0	22.5	19.1
SDC D_0 or D_1		10	NP	~~3.0~~ 6.0	2.0	1.7
		20	NP	~~6.0~~ 12.0	4.0	3.4
		30	NP	~~9.0~~ 18.0	6.0	5.1
		40	NP	~~12.0~~ 24.0	8.0	6.8
		50	NP	~~15.0~~ 30.0	10.0	8.5
		10	NP	~~6.0~~ NP	4.5	3.8
		20	NP	~~12.0~~ NP	9.0	7.7
		30	NP	~~18.0~~ NP	13.5	11.5
		40	NP	~~24.0~~ NP	18.0	15.3
		50	NP	~~30.0~~ NP	22.5	19.1
		10	NP	~~8.5~~ NP	6.0	5.1
		20	NP	~~17.0~~ NP	12.0	10.2
		30	NP	~~25.5~~ NP	18.0	15.3
		40	NP	~~34.0~~ NP	24.0	20.4
		50	NP	~~42.5~~ NP	30.0	25.5

(continued)

TABLE R602.10.1.2(2)[a,b,c]—continued
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY
(AS A FUNCTION OF BRACED WALL LINE LENGTH)

SOIL CLASS D[a] WALL HEIGHT = 10 FT 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING ≤ 25 FT			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG ~~EACH~~[d] BRACED WALL LINE			
Seismic Design Category (SDC)	Story Location	Braced Wall Line Length	Method LIB	METHODS DWB, SFB, GB, PBS, PCP, HPS	Method WSP	Continuous Sheathing
SDC D_2		10	NP	~~4.0~~ 8.0	2.5	2.1
		20	NP	~~8.0~~ 16.0	5.0	4.3
		30	NP	~~12.0~~ 24.0	7.5	6.4
		40	NP	~~16.0~~ 32.0	10.0	8.5
		50	NP	~~20.0~~ 40.0	12.5	10.6
		10	NP	~~7.5~~ NP	5.5	4.7
		20	NP	~~15.0~~ NP	11.0	9.4
		30	NP	~~22.5~~ NP	16.5	14.0
		40	NP	~~30.0~~ NP	22.0	18.7
		50	NP	~~37.5~~ NP	27.5	23.4
		10	NP	NP	NP	NP
		20	NP	NP	NP	NP
		30	NP	NP	NP	NP
		40	NP	NP	NP	NP
		50	NP	NP	NP	NP

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 47.89 Pa.

a. Wall bracing lengths are based on a soil site class "D." Interpolation of bracing length between the S_{ds} values associated with the seismic design categories shall be permitted when a site-specific S_{ds} value is determined in accordance with Section 1613.5 of the *California Building Code*.

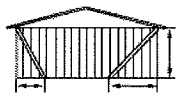
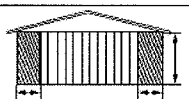
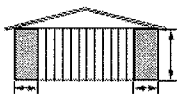
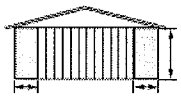
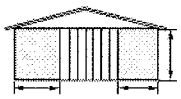
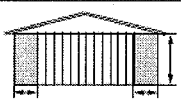
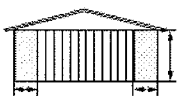
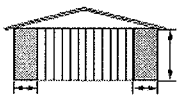
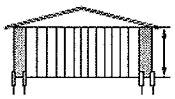
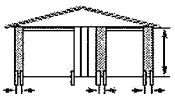
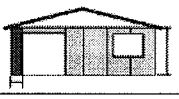
b. Foundation cripple wall panels shall be braced in accordance with Section R602.10.9.

c. Methods of bracing shall be as described in Sections R602.10.2, R602.10.4 and R602.10.5.

d. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC DO, D1, or D2. Methods DWB, SFB, PBS, and HPS are not permitted in SDC D0, D1, or D2.

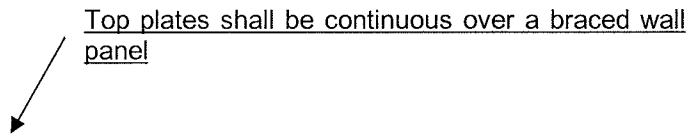
SECTION 39. Table R602.10.2 is hereby amended to read as follows:

TABLE R602.10.2
INTERMITTENT BRACING METHODS [a]

METHOD	MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA
LIB	Let-in-bracing	1 × 4 wood or approved metal straps at 45° to 60° angles for maximum 16″ stud spacing		Wood: 2-8d nails per stud including top and bottom plate metal: per manufacturer
DWB	Diagonal wood boards	3/4″ (1″ nominal) for maximum 24″ stud spacing		2-8d (2 1/2″ × 0.113″) nails or 2 staples, 1 3/4″ per stud
WSP	Wood structural panel (see Section R604)	~~3/8″~~ 15/32"		~~For exterior sheathing~~ 8d common (2 1/2" x 0.131) nails at 6" ~~see Table R602.3(3)~~ spacing (panel edge) at 12" spacing ~~For interior sheathing~~ (intermediate supports), 3/8" edge ~~see Table R602.3(1)~~ distance to panel edge.
SFB	Structural fiberboard sheathing	1/2″ or 25/32″ for maximum 16″ stud spacing		1 1/2″ galvanized roofing nails or 8d common (2 1/2″ × 0.131) nails at 3″ spacing (panel edges) at 6″ spacing (intermediate supports)
GB	Gypsum board	1/2″		Nails or screws at 7″ spacing at panel edges including top and bottom plates; for all braced wall panel locations for exterior sheathing nail or screw size, see Table R602.3(1); for interior gypsum board nail or screw size, see Table R702.3.5
PBS	Particleboard sheathing (see Section R605)	3/8″ or 1/2″ for maximum 16″ stud spacing		1 1/2″ galvanized roofing nails or 8d common (2 1/2″ × 0.131) nails at 3″ spacing (panel edges) at 6 spacing (intermediate supports)
PCP	Portland cement plaster	See Section R703.6 For maximum 16″ stud spacing		1 1/2″, 11 gage, 7/16″ head nails at 6″ spacing or 7/8″, 16 gage staples at 6″ spacing b
HPS	Hardboard panel siding	7/16″ For maximum 16″ stud spacing		0.092″ dia., 0.225″ head nails with length to accommodate 1 1/2″ penetration into studs at 4″ spacing (panel edges), at 8″ spacing (intermediate supports)
ABW	Alternate braced wall	See Section R602.10.3.2		See Section R602.10.3.2
PFH	Intermittent portal frame	See Section R602.10.3.3		See Section R602.10.3.3
PFG	Intermittent portal frame at garage	See Section R602.10.3.4		See Section R602.10.3.4

a. Methods GB and PCP braced wall panel h/w ratio shall not exceed 1:1 in SDC D0, D1, or D2. Methods LIB, DWB, SFB, PBS, HPS, and PFG are not permitted in SDC D0, D1, and D2.
b. Use of staples in braced wall panels shall be prohibited in SDC D0, D1, or D2.

SECTION 40. Figure R602.10.3.2 is amended to read as follows:



SECTION 41. Section R602.10.3.3 is hereby amended to read as follows:

R602.10.3.3 Method PFH: Portal frame with hold-downs.

. . .

1. Each panel shall be fabricated in accordance with Figure R602.10.3.3. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.3.3. A spacer, if used with a built-up header, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. One anchor bolt not less than 5/8-inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be provided in the center of each sill plate. The hold-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation that is continuous across the entire length of the braced wall line. The foundation shall be reinforced as shown on Figure R602.10.3.2. This reinforcement shall be lapped not less than ~~15~~24 inches (~~381~~610 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

. . .

SECTION 42. Figure R602.10.3.3 is hereby amended to read as follows:

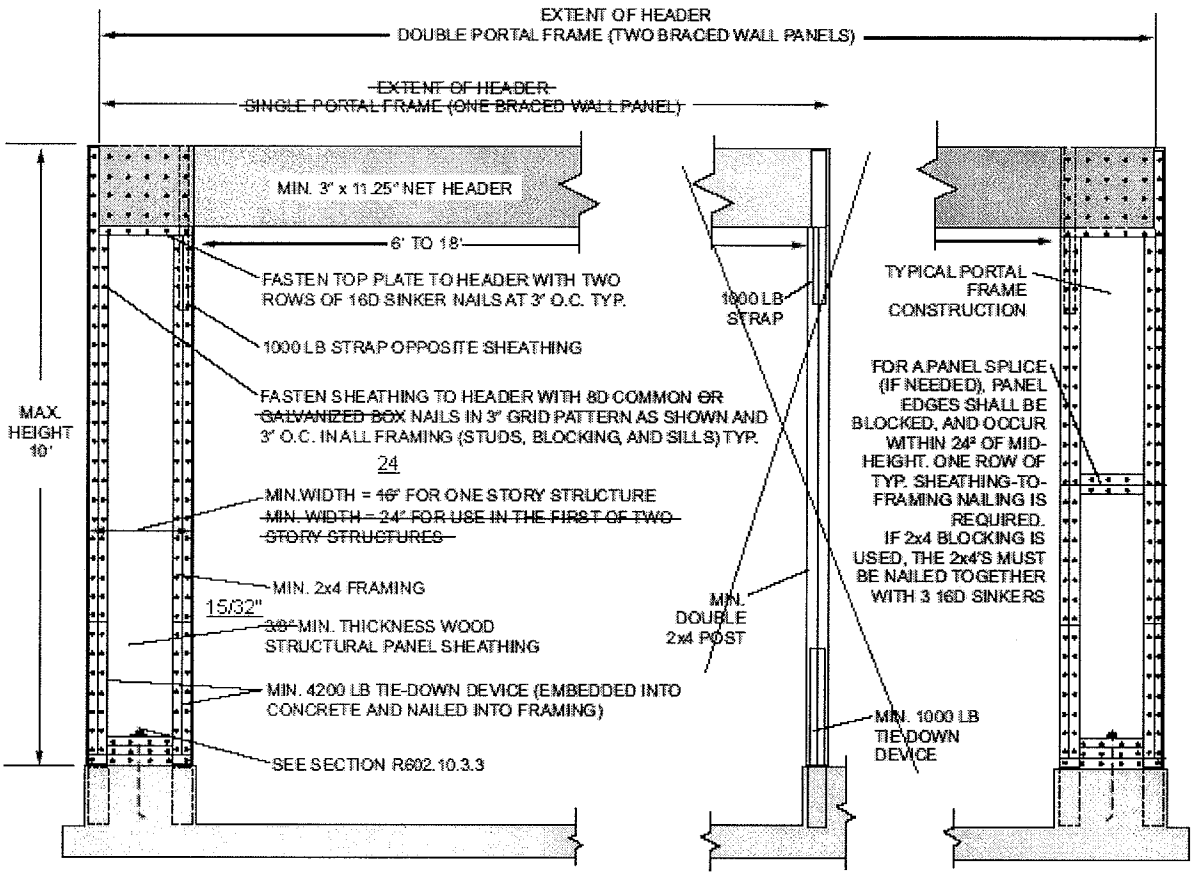


FIGURE R602.10.3.3

METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS AT DETACHED GARAGE DOOR OPENINGS

SECTION 43. Table R602.10.4.1 is hereby amended to read as follows:

TABLE R602.10.4.1

CONTINUOUS SHEATHING METHODS

TABLE R602.10.4.1
CONTINUOUS SHEATHING METHODS

METHOD	MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA
CS-WSP	Wood structural panel	15/32" ~~3/8"~~	8d	~~6d~~ common (2″ × 0.113″) nails at 6″ spacing (panel edges) and at 12″ spacing (intermediate supports) or 16 ga. × 1 3/4 staples at 3″ spacing (panel edges) and 6″ spacing (intermediate supports)[c]
CS-G	Wood structural panel adjacent to garage openings and supporting roof load only[a,b]	15/32" ~~3/8"~~		See Method CS-WSP
CS-PF	Continuous portal frame	See Section R602.10.4.1.1		See Section R602.10.4.1.1

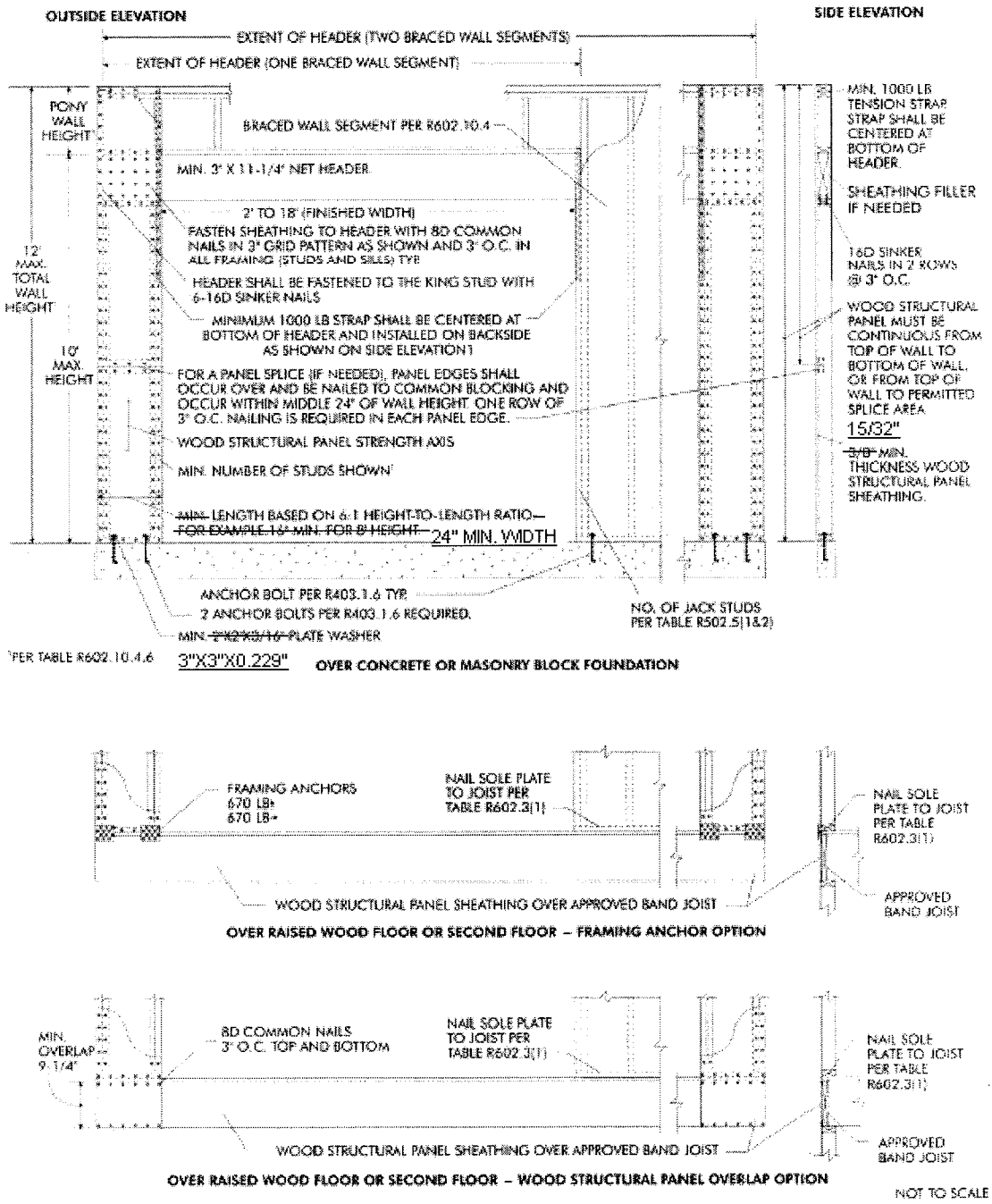
For SI: 1 inch = 25.4 mm, 1 pound per square foot = 47.89 Pa.

a. Applies to one wall of a garage only.

b. Roof covering dead loads shall be 3 psf or less.

c. Use of staples in braced wall panels shall be prohibited in Seismic Design Category D0, D1, or D2.

SECTION 44. Figure R602.10.4.1.1 is hereby amended to read as follows:



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound force = 4.448 N.

FIGURE R602.10.4.1.1
METHOD CS-PF: CONTINUOUS PORTAL FRAME PANEL CONSTRUCTION

. . .

SECTION 45. Section R602.10.7.1 is hereby deleted in its entirety.

~~**R602.10.7.1 Braced wall panel support for Seismic Design Category D2.** In one-story buildings located in Seismic Design Category D2, braced wall panels shall be supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm). In two-story buildings located in Seismic Design Category D2, all braced wall panels shall be supported on continuous foundations.~~

~~Exception: Two-story buildings shall be permitted to have interior braced wall panels supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:~~

~~1. The height of cripple walls does not exceed 4 feet (1219 mm).~~

~~2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.~~

~~3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.~~

SECTION 46. Section R606.2.4 is hereby amended to read as follows:

R606.2.4 Parapet walls.

Unreinforced solid masonry parapet walls shall not be less than 8 inches (203 mm) thick and their height shall not exceed four times their thickness. Unreinforced hollow unit masonry parapet walls shall be not less than 8 inches (203 mm) thick, and their height shall not exceed three times their thickness. Masonry parapet walls in areas subject to wind loads of 30 pounds per square foot (1.44 kPa) or

located in Seismic Design Category D_0, D_1, or D_2, or on townhouses in Seismic Design Category C shall be reinforced in accordance with Section R606.12.

SECTION 47. Section R802.8 is hereby amended to read as follows:

R802.8 Lateral support.

Roof framing members and ceiling joists having a depth-to-thickness ratio exceeding ~~5~~2 to 1 based on nominal dimensions shall be provided with lateral support at points of bearing to prevent rotation. For roof rafters with ceiling joists attached per Table R602.3(1), the depth-thickness ratio for the total assembly shall be determined using the combined thickness of the rafter plus the attached ceiling joist.

. . .

SECTION 48. Section R802.10.2 is hereby amended to read as follows:

R802.10.2 Design.

Wood trusses shall be designed in accordance with accepted engineering practice. The design and manufacture of metal-plate-connected wood trusses shall comply with ANSI/TPI 1. The truss design drawings shall be prepared by a registered professional ~~where required by the statutes of the jurisdiction in which the project is to be constructed in accordance with Section R106.1~~.

SECTION 49. Table R802.5.1(9) is hereby amended to read as follows:

TABLE R802.5.1(9)
RAFTER/CEILING JOIST HEEL JOINT CONNECTIONS[a, b, c, d, e, f, h, i]

RAFTER SLOPE	RAFTER SPACING (inches)	GROUND SNOW LOAD (psf)															
		20[g]				30				50				70			
		Roof span (feet)															
		12	20	28	36	12	20	28	36	12	20	28	36	12	20	28	36
		Required number of 16d common nails[a, b] per heel joint splices[c, d, e, f]															
3:12	12	4	6	8	10	4	6	8	11	5	8	12	15	6	11	15	20
	16	5	8	10	13	5	8	11	14	6	11	15	20	8	14	20	26
	24	7	11	15	19	7	11	16	21	9	16	23	30	12	21	30	39
4:12	12	3	5	6	8	3	5	6	8	4	6	9	11	5	8	12	15
	16	4	6	8	10	4	6	8	11	5	8	12	15	6	11	15	20
	24	5	8	12	15	5	9	12	16	7	12	17	22	9	16	23	29
5:12	12	3	4	5	6	3	4	5	7	3	5	7	9	4	7	9	12
	16	3	5	6	8	3	5	7	9	4	7	9	12	5	9	12	16
	24	4	7	9	12	4	7	10	13	6	10	14	18	7	13	18	23
7:12	12	3	4	4	5	3	3	4	5	3	4	5	7	3	5	7	9
	16	3	4	5	6	3	4	5	6	3	5	7	9	4	6	9	11
	24	3	5	7	9	3	5	7	9	4	7	10	13	5	9	13	17
9:12	12	3	3	4	4	3	3	3	4	3	3	4	5	3	4	5	7
	16	3	4	4	5	3	3	4	5	3	4	5	7	3	5	7	9
	24	3	4	6	7	3	4	6	7	3	6	8	10	4	7	10	13
12:12	12	3	3	3	3	3	3	3	3	3	3	3	4	3	3	4	5
	16	3	3	4	4	3	3	3	4	3	3	4	5	3	4	5	7
	24	3	4	4	5	3	3	4	6	3	4	6	8	3	6	8	10

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kPa.

a. 40d box nails shall be permitted to be substituted for 16d common nails.

b. Nailing requirements shall be permitted to be reduced 25 percent if nails are clinched.

c. Heel joint connections are not required when the ridge is supported by a load-bearing wall, header or ridge beam.

d. When intermediate support of the rafter is provided by vertical struts or purlins to a loadbearing wall, the tabulated heel joint connection requirements shall be permitted to be reduced proportionally to the reduction in span.

e. Equivalent nailing patterns are required for ceiling joist to ceiling joist lap splices.

f. When rafter ties are substituted for ceiling joists, the heel joint connection requirement shall be taken as the tabulated heel joint connection requirement for two-thirds of the actual rafter-slope.

g. Applies to roof live load of 20 psf or less.

h. Tabulated heel joint connection requirements assume that ceiling joists or rafter ties are located at the bottom of the attic space. When ceiling joists or rafter ties are located higher in the attic, heel joint connection requirements shall be increased by the following factors:

H_C/H_R	Heel Joint Connection Adjustment Factor
1/3	1.5
1/4	1.33
1/5	1.25
1/6	1.2
1/10 or less	1.11

where:

H_C = Height of ceiling joists or rafter ties measured vertically above the top of the rafter support walls.

H_R = Height of roof ridge measured vertically above the top of the rafter support walls.

i. Edge distances, end distances and spacings for nails shall be sufficient to prevent splitting of the wood.

SECTION 50. Section R803.2.4 is hereby added to read as follows:

R803.2.4 Openings in horizontal diaphragms.

Openings in horizontal diaphragms shall conform with Section R503.2.4.

SECTION 51. Section R1001.3.1 is hereby amended to read as follows:

R1001.3.1 Vertical reinforcing.

For chimneys up to 40 inches (1016 mm) wide, four No. 4 continuous vertical bars adequately anchored into the concrete foundation shall be placed between wythes of solid masonry or within the cells of hollow unit masonry and grouted in accordance with Section R609. Grout shall be prevented from bonding with the flue liner so that the flue liner is free to move with thermal expansion. For chimneys more than 40 inches (1016 mm) wide, two additional No. 4 vertical bars shall be provided for each additional flue incorporated into the chimney or for each additional 40 inches (1016 mm) in width or fraction thereof.

SECTION 52. The provisions of this ordinance contain various changes, modifications, and additions to the 2010 Edition of the California Residential Code. Some of these changes are administrative in nature in that they do not constitute changes or modifications to requirements contained in the building standards published in the California Building Standards Code.

Pursuant to California Health and Safety Code sections 17958.5, 17958.7, and 18941.5, the Board of Supervisors hereby expressly finds that all of the changes and modifications to requirements contained in the building standards published in the California Building Standards Code, contained in this ordinance, which are not

administrative in nature, are reasonably necessary because of local climatic, geological, or topographical conditions in the County of Los Angeles as more particularly described in the table set forth below.

Code Section	Condition	Explanation of Amendment
R301.1.3.2	Geological	After the 1994 Northridge Earthquake, the Wood Frame Construction Joint Task Force recommended that the quality of wood frame construction needs to be greatly improved. One such recommendation identified by the Task Force is to improve the quality and organization of structural plans prepared by the engineer or architect so that plan examiners, building inspectors, contractors, and special inspectors may logically follow and construct the presentation of the seismic force-resisting systems in the construction documents. For buildings or structures located in Seismic Design Category D_0, D_1, D_2, or E that are subject to a greater level of seismic forces, the requirement to have a California licensed architect or engineer prepare the construction documents is intended to minimize or reduce structural deficiencies that may cause excessive damage or injuries in wood frame buildings. Structural deficiencies such as plan and vertical irregularities, improper shear transfer of the seismic force-resisting system, missed details or connections important to the structural system, and the improper application of the prescriptive requirements of the California Residential Code can be readily addressed by a registered design professional.
R301.1.4	Geological Topographical	This technical amendment is for buildings constructed on hillsides. Due to the local topographical and geological conditions of the sites within the greater Los Angeles region and their susceptibility to earthquakes, this amendment is required to address and clarify special needs for buildings constructed on hillside locations. A joint Structural Engineers Association of Southern California (SEAOSC), Los Angeles County, and Los Angeles City Task Force investigated the performance of hillside building failures after the Northridge earthquake. Numerous hillside failures resulted in loss of life and

Code Section	Condition	Explanation of Amendment
		millions of dollars in damage. These criteria were developed to minimize the damage to these structures and have been in use by the City and County of Los Angeles for several years.
R301.2.2.2.5	Geological	Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this local amendment limits the type of irregular conditions as specified in the 2010 California Residential Code. Such limitations are recommended to reduce structural damages in the event of an earthquake. The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear walls and all associated elements when designed for high levels of seismic loads.
R301.2.2.3.5.1	Geological	The term "one" in AISI S230, Section B1 conflicts with Table B1-1, whereas in the table it states the "thinnest connected steel sheet." The term "one" in the AISI S230, Section B1 language can misleadingly be interpreted as though one of the sheets can be 33 mils and the other sheet thicker, but that you still qualify for a reduction factor; this is not the intent of the tables. For example, in a steel-to-steel connection consisting of a 33 mils and 44 mils, and if in any part of the code it is required to provide (4) No. 8 screws; according to Table B1-1 the factor 1.0 would apply to the required number of screws and thus a reduction of screws would not be allowed.
R322.1.4.1	Geological Topographical	This amendment is intended to clarify who should perform studies and analyses for design flood elevations. Based on our vast experience with drainage and grading sites, we have concluded that registered civil engineers are highly equipped to perform such design and analyses.
R327	Climatic	States that Chapter R327 requirements are applicable to all occupancy groups as wildfire exposure impacts all types of buildings and structures. This amendment is needed due to the high-fire severity zones caused by low humidity, strong winds and dry vegetation.
R327.1.1	Climatic	Clarifies the application of Chapter R327 to include additions, alterations, and/or relocated buildings. Additions, alterations, and/or relocated buildings have the same fire risk as new buildings.

Code Section	Condition	Explanation of Amendment
R327.1.3	Climatic	Clarifies the application of Chapter R327 to include additions, alterations, and/or relocated buildings. Additions, alterations, and/or relocated buildings have the same fire risk as new buildings.
R327.1.3.1	Climatic	Clarifies the application of Chapter R327 to include additions, alterations, and/or relocated buildings. Additions, alterations, and/or relocated buildings have the same fire risk as new buildings.
R327.3.5.2	Climatic	Due to low humidity, strong winds, and dry vegetation in high-fire severity zones, the Fire Department could not find sufficient evidence to allow the use of wood-shingle/wood-shake roof.
R327.3.5.2.2	Climatic	Due to low humidity, strong winds and dry vegetation in high-fire severity zones, the Fire Department could not find sufficient evidence to allow the use of wood-shingle/wood-shake roof.
R327.4.3	Climatic	Due to low humidity, strong winds, and dry vegetation in high-fire severity zones, the Fire Department could not find sufficient evidence to allow the use of wood-shingle/wood-shake roof.
R327.5.2	Climatic	Due to low humidity, strong winds, and dry vegetation in high-fire severity zones, the Fire Department could not find sufficient evidence to allow the use of wood-shingle/wood-shake roof and would require the use of Class A roof covering.
R401.1	Geological	Wood foundations, even those that are preservative-treated, encounter a higher risk of deterioration when contacting the adjacent ground. The required seismic anchorage and transfer of lateral forces into the foundation system necessary for 2-story structures and foundation walls could become compromised at varying states of wood decay. In addition, global structure overturning moment and sliding resistance is reduced when utilizing wood foundations as opposed to conventional concrete or masonry systems. However, non-occupied, single-story storage structures pose significantly less risk to human safety and should be able to utilize the wood foundation guidelines specified in this Chapter.
R403.1.2 R403.1.3 R403.1.5	Climatic Geological	This proposed amendment requires minimum reinforcement in continuous footings and stepped footings to address the problem of poor performance of plain or under-reinforced footings during a seismic event. This amendment reflects the recommendations by the

Code Section	Condition	Explanation of Amendment
		Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in the 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles. Interior walls can easily be called upon to resist over half of the seismic loading imposed on simple buildings or structures. Without a continuous foundation to support the braced wall line, seismic loads would be transferred through other elements such as non-structural concrete slab floors, wood floors, etc. Requiring interior braced walls be supported by continuous foundations is intended to reduce or eliminate the poor performance of buildings or structures.
R404.2	Climatic Geological	No substantiating data has been provided to show that wood foundations are effective in supporting structures and buildings during a seismic event while being subject to deterioration caused by presence of water in the soil as well as other materials detrimental to wood foundations. Wood foundations, when they are not properly treated and protected against deterioration, have performed very poorly and have led to slope failures. Most contractors are typically accustomed to construction in dry weather in the Southern California region and are not generally familiar with the necessary precautions and treatment of wood that makes it suitable for both seismic events and wet applications. With the higher seismic demand placed on buildings and structures in this region, coupled with the dryer weather conditions here as oppose to the northern and eastern part of the country, it is the intent of this proposal to take the necessary precautionary steps to reduce or eliminate potential problems that may result from the use of wood footings and foundations that does not take into consideration the conditions of this surrounding environment.
R501.1	Geological	There is no limitation for weight of mechanical and plumbing fixtures and equipment in the CRC Code. Requirements of ASCE 7-05 and CBC are necessary that limits equipment weight up to 400 pounds, mounted at 4 feet or less above the floor or attic level without engineering design.

Code Section	Condition	Explanation of Amendment
R503.2.4	Geological	Section R502.10 of the Code does not provide any prescriptive criteria to limit the maximum floor opening size nor does Section R503 provide any details to address the issue of shear transfer near larger floor openings. With the higher seismic demand placed on buildings and structures in this region, it is important to ensure that a complete load path is provided to reduce or eliminate potential damages caused by seismic forces. Requiring blocking with metal ties around larger floor openings and limiting opening size is consistent with the requirements of Section R301.2.2.2.5.
602.3.2	Geological	The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads by eliminating single top plate construction. The performance of modern day braced wall panel construction is directly related to an adequate load path extending from the roof diaphragm to the foundation system.
Table R602.3(1)	Geological	In September 2007, limited cyclic testing data was provided to the ICC Los Angeles Chapter Structural Code Committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed wood structural shear panels. As a matter of fact, the test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results. Therefore, the use of staples as fasteners for shear walls sheathed with other materials shall not be permitted without being substantiated by cyclic testing. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles for the California Building Code.
Table R602.3(2)	Geological	In September 2007, limited cyclic testing data was provided to the ICC Los Angeles Chapter Structural Code Committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed wood structural shear panels. As a matter of fact, the test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results. Therefore, the

Code Section	Condition	Explanation of Amendment
		use of staples as fasteners for shear walls sheathed with other materials shall not be permitted without being substantiated by cyclic testing. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles for the California Building Code.
Table R602.10.1.2(2)	Geological	Due to the high geologic activities in the Southern California area and the expected higher level of performance on buildings and structures, this local amendment continues to reduce/eliminate the allowable shear values for shear walls sheathed with lath, plaster, or gypsum board. The poor performance of such shear walls sheathed with other materials in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force. The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads. In addition, this proposed amendment is consistent with the conventional framing provisions of the 2010 California Building Code.
Table R602.10.2	Geological	3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. This proposed amendment specifies minimum WSP sheathing thickness and nail size and spacing so as to provide a uniform standard of construction for designers and buildings to follow. This is intended to improve the performance level of buildings and structures that are subject to the higher seismic demands placed on buildings or structure in this region. This proposed amendment reflects the recommendations by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Joint Task Force that investigated the poor performance observed in 1994 Northridge Earthquake. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles for the California Building Code. In September 2007, cyclic testing data was provided to the structural code committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed

Code Section	Condition	Explanation of Amendment
		wood structural shear panels. In addition, the test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results.
Figure R602.10.3.2	Geological	3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. The poor performance of such shear walls sheathed in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force. Box nails were observed to cause massive and multiple failures of the typical 3/8" thick 3 ply-plywood during the Northridge Earthquake. The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads. The proposal for minimum lap splice requirement is consistent with Section 12.16.1 of ACI 318-05. The performance of modern day braced wall panel construction is directly related to an adequate load path extending from the roof diaphragm to the foundation system. This proposed amendment continues amendments adopted during the previous code cycle for the California Building Code.
R602.10.3.3	Geological	The proposal to change the minimum lap splice requirement is consistent with Section 12.16.1 of ACI 318-05.
Figure R602.10.3.3	Geological	3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. The poor performance of such shear walls sheathed in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force. The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads. Box nails were observed to cause massive and multiple failures of the typical 3/8-inch thick plywood during the Northridge Earthquake. This proposed amendment continues amendments adopted during the previous code cycle for the California Building Code.

Code Section	Condition	Explanation of Amendment
Table R602.10.4.1	Geological	3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. The poor performance of such shear walls sheathed in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force. The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads. This proposed amendment continues the previous amendment adopted during the 2007 code adoption cycle for the California Building Code. In September 2007, limited cyclic testing data was provided to the ICC Los Angeles Chapter Structural Code Committee showing that stapled wood structural shear panels do not exhibit the same behavior as the nailed wood structural shear panels. As a matter of fact, the test results of the stapled wood structural shear panels appeared much lower in strength and drift than the nailed wood structural shear panel test results. Therefore, the use of staples as fasteners for shear walls sheathed with other materials shall not be permitted without being substantiated by cyclic testing. This proposed amendment is a continuation of an amendment adopted during previous code adoption cycles.
Figure R602.10.4.1.1	Geological	3/8" thick 3 ply-plywood shear walls experienced many failures during the Northridge Earthquake. The poor performance of such shear walls sheathed in the 1994 Northridge Earthquake was investigated by the Structural Engineers Association of Southern California (SEAOSC) and the Los Angeles City Task Force. The cities and county of the Los Angeles region have taken extra measures to maintain the structural integrity of the framing of the shear walls when designed for high levels of seismic loads. This proposed amendment continues the previous amendment adopted during the 2007 code adoption cycle for the California Building Code. The proposal in which "washers shall be a minimum of 0.229 inch by 3 inches by 3 inches in size" is consistent with Section R602.11.1 of the 2010 California Residential Code and Section 2308.12.8 of the 2010 California Building Code.

Code Section	Condition	Explanation of Amendment
R602.10.7.1	Geological	The performance of modern day braced wall panel construction is directly related to an adequate load path extending from the roof diaphragm to the foundation system. Interior braced wall panels, therefore, are also directly dependent upon the adequacy of the foundation system. In addition, the proposed amendment for Section R403.1.2 specifies that all exterior walls and required interior braced wall panels in buildings shall be supported with continuous footings.
R606.2.4	Geological	The addition of the word "or" will prevent the use of unreinforced parapets in Seismic Design Category D_0, D_1, or D_2, or on townhouses in Seismic Design Category C.
Table R802.5.1(9)	Geological	The number of nails required for the heel joint connection per Table R802.5.1(9) can be excessive depending on the rafter slope, spacing, and roof span. This footnote will help to prevent splitting of connecting wood members when large numbers of nail are required as stated in the National Design Specification for Wood Construction (NDS).
R802.8	Geological	This proposed amendment provides provisions to ensure that the ends of wood members and the points of bearing have adequate lateral support to prevent rotation and to help stabilize the members during construction. This proposed amendment is consistent with and similar to requirements contained in the NDS.
R802.10.2	Geological	Wood trusses are engineered structural elements that require engineered design and calculations. This amendment provides clarifications that all wood truss design drawings are to be prepared by a registered professional.
R803.2.4	Geological	Section R802 of the Code does not provide any prescriptive criteria to limit the maximum size of roof openings, nor does Section R803 provide any details to address the issue of shear transfer near larger roof openings. With the higher seismic demand placed on buildings and structures in this region, it is important to ensure that a complete load path is provided to reduce or eliminate potential damage caused by seismic forces. Requiring blocking with metal ties around larger roof openings and limiting the size of openings is consistent with the requirements of Section R301.2.2.2.5.

Code Section	Condition	Explanation of Amendment
R1001.3.1	Geological	The performance of fireplaces/chimneys without anchorage to the foundation has been observed to be inadequate during major earthquakes. The lack of anchorage to the foundation results in overturn or displacement.

SECTION 53. This ordinance shall become operative on January 1, 2011.

[30RESBLDNGMYCC]