

# REVISION RECORD FOR THE STATE OF CALIFORNIA

## ERRATA

January 1, 2017

### 2016 Title 24, Part 2.5, California Residential Code

#### General Information:

1. The date of these errata is for identification purposes only. See the History Note Appendix at the end of the code.
2. These errata are issued by the California Building Standards Commission in order to correct nonsubstantive printing errors or omissions in California Code of Regulations, Title 24, Part 2.5, of the 2016 *California Residential Code*. Instructions are provided below.
3. Health and Safety Code Section 18938.5 establishes that only building standards in effect at the time of the application for a building permit may be applied to the project plans and construction. This rule applies to both adoptions of building standards for Title 24 by the California Building Standards Commission and local adoptions and ordinances imposing building standards. An erratum to Title 24 is a nonregulatory correction because of a printing error or omission that does not differ substantively from the official adoption by the California Building Standards Commission. Accordingly, the corrected code text provided by this erratum may be applied on and after the stated effective date.
4. You may wish to retain the superseded material with this revision record so that the prior wording of any section can be easily ascertained.

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43 and 44  
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#### Insert Buff Colored Pages

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**R106.1.3 Information on braced wall design.** For buildings and structures utilizing braced wall design, and where required by the building official, braced wall lines shall be identified on the construction documents. Pertinent information including, but not limited to, bracing methods, location and length of braced wall panels and foundation requirements of braced wall panels at top and bottom shall be provided.

**R106.1.4 Information for construction in flood hazard areas.** For buildings and structures located in whole or in part in flood hazard areas as established by Table R301.2(1), construction documents shall include:

1. Delineation of flood hazard areas, floodway boundaries and flood zones and the design flood elevation, as appropriate.
2. The elevation of the proposed lowest floor, including basement; in areas of shallow flooding (AO Zones), the height of the proposed lowest floor, including basement, above the highest adjacent grade.
3. The elevation of the bottom of the lowest horizontal structural member in coastal high hazard areas (V Zone) and in Coastal A Zones where such zones are delineated on flood hazard maps identified in Table R301.2(1) or otherwise delineated by the jurisdiction.
4. If design flood elevations are not included on the community's Flood Insurance Rate Map (FIRM), the building official and the applicant shall obtain and reasonably utilize any design flood elevation and floodway data available from other sources.

**R106.2 Site plan or plot plan.** The construction documents submitted with the application for permit shall be accompanied by a site plan showing the size and location of new construction and existing structures on the site and distances from lot lines. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan where the application for permit is for alteration or repair or where otherwise warranted.

**R106.3 Examination of documents.** The building official shall examine or cause to be examined construction documents for code compliance.

**R106.3.1 Approval of construction documents.** Where the building official issues a permit, the construction documents shall be approved in writing or by a stamp that states "REVIEWED FOR CODE COMPLIANCE." One set of construction documents so reviewed shall be retained by the building official. The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the building official or a duly authorized representative.

**R106.3.2 Previous approvals.** This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful

permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

**R106.3.3 Phased approval.** The building official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure will be granted.

**R106.4 Amended construction documents.** Work shall be installed in accordance with the approved construction documents, and any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

**R106.5 Retention of construction documents.** One set of approved construction documents shall be retained by the building official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

## SECTION R107 TEMPORARY STRUCTURES AND USES

**R107.1 General.** The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.

**R107.2 Conformance.** Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

**R107.3 Temporary power.** The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.

**R107.4 Termination of approval.** The building official is authorized to terminate such permit for a temporary structure or use and to order the temporary structure or use to be discontinued.

## SECTION R108 FEES

**R108.1 Payment of fees.** A permit shall not be valid until the fees prescribed by law have been paid, nor shall an amend-

ment to a permit be released until the additional fee, if any, has been paid.

**R108.2 Schedule of permit fees.** On buildings, structures, electrical, gas, mechanical and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.

**R108.3 Building permit valuations.** Building permit valuation shall include total value of the work for which a permit is being issued, such as electrical, gas, mechanical, plumbing equipment and other permanent systems, including materials and labor.

**R108.4 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection to or concurrently with the work authorized by a building permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

**R108.5 Refunds.** The building official is authorized to establish a refund policy.

**R108.6 Work commencing before permit issuance.** Any person who commences work requiring a permit on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the applicable governing authority that shall be in addition to the required permit fees.

## SECTION R109 INSPECTIONS

**R109.1 Types of inspections.** For on-site construction, from time to time the building official, upon notification from the permit holder or his agent, shall make or cause to be made any necessary inspections and shall either approve that portion of the construction as completed or shall notify the permit holder or his or her agent wherein the same fails to comply with this code. *The enforcing agency upon notification of the permit holder or their agent shall within a reasonable time make the inspections set forth in Sections R109.1.1, R109.1.1.1, R109.1.3, R109.1.4, R109.1.4.1, R109.1.4.2, R109.1.5, R109.1.5.1, R109.1.5.2, R109.1.6, R109.1.6.1 and R109.1.6.2.*

**Note:** *Reinforcing steel or structural framework of any part of any building or structure shall not be covered or concealed without first obtaining the approval of the enforcing agency.*

**R109.1.1 Foundation inspection.** Inspection of the foundation and footings shall be made after poles or piers are set or trenches or basement areas are excavated and any required forms erected and any required reinforcing steel is in place and supported prior to the placing of concrete. The foundation or footings inspection shall include excavations for thickened slabs intended for the support of bearing walls, partitions, structural supports, or equipment and special requirements for wood foundations. *Materials for the foundation shall be on the job site except where concrete is ready-mixed in accordance with ASTM C94. Under this circumstance, concrete is not required to be at the job site.*

**R109.1.1.1 Concrete slab and under-floor inspection.** *Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduits, piping or other ancillary building trade products or equipment are installed, but before any concrete is placed or floor sheathing is installed, including the subfloor.*

**R109.1.2 Plumbing, mechanical, gas and electrical systems inspection.** Rough inspection of plumbing, mechanical, gas and electrical systems shall be made prior to covering or concealment, before fixtures or appliances are set or installed, and prior to framing inspection.

**Exception:** Backfilling of ground-source heat pump loop systems tested in accordance with Section M2105.28 prior to inspection shall be permitted.

**R109.1.3 Floodplain inspections.** For construction in flood hazard areas as established by Table R301.2(1), upon placement of the lowest floor, including basement, and prior to further vertical construction, the building official shall require submission of documentation, prepared and sealed by a registered design professional, of the elevation of the lowest floor, including basement, required in Section R322.

**R109.1.4 Frame and masonry inspection.** Inspection of framing and masonry construction shall be made after the roof, masonry, framing, firestopping, draftstopping and bracing are in place and after chimneys and vents to be concealed are completed and the rough electrical, plumbing, heating, wires, pipes and ducts are approved.

**R109.1.4.1 Moisture content verification.** *Moisture content of framing members shall be verified in accordance with the California Green Building Standards Code, Chapter 4, Division 4.5.*

**R109.1.4.2 Lath and gypsum board inspection.** *Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior, is in place, but before any plastering is applied or gypsum board joints and fasteners are taped and finished.*

**R109.1.5 Other inspections.** In addition to inspections in Sections R109.1.1 through R109.1.4.2, the building official shall have the authority to make or require any other inspections to ascertain compliance with this code and other laws enforced by the building official.

**R109.1.5.1 Fire-resistance-rated construction inspection.** Where fire-resistance-rated construction is required between dwelling units or due to location on property, the building official shall require an inspection of such construction after lathing or gypsum board or gypsum panel products are in place, but before any plaster is applied, or before board or panel joints and fasteners are taped and finished. *Protection of joints and penetrations in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved.*

**R109.1.5.2 Special inspections.** *For special inspections, see California Building Code, Chapter 17.*

## CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE CHAPTER 2 – DEFINITIONS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X	X																
Adopt only those sections that are listed below			X																		
Chapter / Section																					
R201.1			X																		
R201.2			X																		
R201.3			X	X																	
R201.4			X																		
ACCESSORY STRUCTURE			X																		
ADDITION			X																		
AGED HOME OR INSTITUTION			X																		
ALTERATION			X	X																	
APPROVED			X	X																	
APPROVED AGENCY			X	X																	
APPROVED LISTING AGENCY			X	X																	
APPROVED TESTING AGENCY			X	X																	
ATTIC			X																		
ATTIC, HABITABLE			X																		
BASEMENT			X																		
BEDRIDDEN PERSON			X																		
BUILDING			X	X																	
BUILDING OFFICIAL			X																		
BUILT-UP ROOF COVERING			X																		
CARE AND SUPERVISION			X																		
CATASTROPHICALLY INJURED			X																		
CEILING HEIGHT			X																		
CHILD-CARE CENTER			X																		
CHILD OR CHILDREN			X																		
CHRONICALLY ILL			X																		
CLIMATE ZONES				X																	
CLOSET			X																		
COMBUSTIBLE MATERIAL			X																		
CONGREGATE LIVING HEALTH-FACILITY (CLHF)			X																		
CONGREGATE RESIDENCE			X																		
CONSTRUCTION DOCUMENTS			X																		
DAYCARE			X																		
DAY-CARE HOME, FAMILY			X																		
DAY-CARE HOME, LARGE FAMILY			X																		
DAY-CARE HOME, SMALL FAMILY			X																		
DEPARTMENT				X																	
DESIGN PROFESSIONAL			X																		

(continued)

**CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE  
CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X	X																
Adopt only those sections that are listed below			X																		
Chapter / Section																					
DRAFT STOP			X																		
DUCT SYSTEM				X																	
DWELLING			X																		
DWELLING UNIT			X																		
EFFICIENCY DWELLING UNIT				X																	
EMERGENCY ESCAPE AND RESCUE OPENING			X																		
ENFORCEMENT				X																	
ENFORCEMENT AGENCY				X																	
ENFORCING AGENCY			X	X																	
EXTERIOR WALL			X																		
FAMILY				X																	
FENESTRATION				X																	
FIREBLOCKING			X																		
FIRE-RETARDANT-TREATED WOOD			X																		
FIRE SEPARATION DISTANCE			X																		
FLAME SPREAD			X																		
FLAME SPREAD INDEX			X																		
FULL-TIME CARE			X																		
GRADE			X																		
GRADE FLOOR OPENING			X																		
GRADE PLANE			X																		
GUARD OR GUARDRAIL				X																	
HABITABLE SPACE			X																		
HANDRAIL			X																		
HAZARDOUS LOCATION			X																		
HEIGHT, BUILDING			X																		
HEIGHT, STORY			X																		
IGNITION SOURCE			X																		
INFANT			X																		
INSULATING SHEATHING				X																	
LABEL			X																		
LABELED			X	X																	
LIMITED-DENSITY OWNER- BUILT RURAL DWELLINGS				X																	
LISTED			X	X																	
LISTING AGENCY				X	X																
LIVING SPACE			X																		
LODGING HOUSE				X																	
LOT			X																		
LOT LINE			X																		
MARK			X																		

(continued)



**CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE  
CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	BSC-CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X	X																
Adopt only those sections that are listed below			X																		
Chapter / Section																					
MASONRY UNIT				X																	
METAL ROOF PANEL			X																		
METAL ROOF SHINGLE			X																		
MEZZANINE, LOFT			X																		
MULTIPLE STATION SMOKE ALARM			X																		
NONAMBULATORY PERSONS			X																		
NONCOMBUSTIBLE MATERIAL			X																		
OCCUPIED SPACE			X																		
OWNER			X																		
PASSIVE SOLAR ENERGY COLLECTOR				X																	
PERSONS WITH INTELLECTUAL DISABILITIES, PROFOUNDLY OR SEVERELY			X																		
PROTECTIVE SOCIAL CARE FACILITY			X																		
PUBLIC WAY			X																		
RAMP			X																		
REPAIR			X	X																	
REROOFING			X																		
RESIDENTIAL CARE FACILITY FOR THE CHRONICALLY ILL (RCF/CI)			X																		
RESIDENTIAL CARE FACILITY FOR THE ELDERLY (RCFE)			X																		
RESIDENTIAL FACILITY (RF)			X																		
RESTRAINT			X																		
RISER				X																	
ROOF ASSEMBLY			X																		
ROOF COVERING			X																		
ROOF COVERING SYSTEM			X																		
ROOFDECK			X																		
ROOF RECOVER			X																		
ROOF REPAIR			X																		
ROOFTOP STRUCTURE			X																		
SHALL			X																		
SINGLE STATION SMOKE ALARM			X																		
SMOKE-DEVELOPED INDEX			X																		
STAIR			X																		
STAIRWAY			X																		
STATE-OWNED/LEASED BUILDING			X																		

(continued)

**CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE  
CHAPTER 2 – DEFINITIONS—continued**

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X	X																
Adopt only those sections that are listed below			X																		
Chapter / Section																					
STORY			X																		
STORY ABOVE GRADE PLANE			X																		
STRUCTURE			X																		
SUNROOM				X																	
TERMINALLY ILL			X																		
TESTING AGENCY				X																	
TOWNHOUSE			X																		
VENTILATION				X																	

The state agency does not adopt sections identified with the following symbol: †

# Part II—Definitions

## CHAPTER 2 DEFINITIONS

*Code change proposals to definitions in this chapter preceded by a bracketed letter are considered by the IRC-Building Code Development Committee [RB] or the IECC-Residential Code Development Committee [RE] during the Group B (2016) Code Development cycle. See page x for explanation.*

### SECTION R201 GENERAL

**R201.1 Scope.** Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings indicated in this chapter.

**R201.2 Interchangeability.** Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.

**R201.3 Terms defined in other codes.** Where terms are not defined in this code such terms shall have meanings ascribed to them as in the *California Building Standards Code, Title 24, California Code of Regulations*.

**R201.4 Terms not defined.** Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

*For applications listed in Section 1.11 regulated by the Office of the State Fire Marshal, where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies. Webster’s Third New International Dictionary of the English Language, Unabridged, shall be considered as providing ordinarily accepted meanings.*

### SECTION R202 DEFINITIONS

**[RB] ACCESSORY STRUCTURE.** A structure that is accessory to and incidental to that of the dwelling(s) and that is located on the same lot.

**[RB] ADDITION.** An extension or increase in floor area or height of a building or structure.

**[RB] ADHERED STONE OR MASONRY VENEER.** Stone or masonry veneer secured and supported through the adhesion of an approved bonding material applied to an approved backing.

**AGED HOME OR INSTITUTION.** A facility used for the housing of persons 65 years of age or older in need of care and supervision. (See definition of “care and supervision.”)

**[RB] AIR-IMPERMEABLE INSULATION.** An insulation having an air permeance equal to or less than 0.02 L/s-m<sup>2</sup> at

75 Pa pressure differential as tested in accordance with ASTM E2178 or E283.

**[RB] ALTERATION.** Any construction or renovation to an existing structure other than repair or addition.

**[RB] ALTERNATING TREAD DEVICE.** A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

**[RB] ANCHORED STONE OR MASONRY VENEER.** Stone or masonry veneer secured with approved mechanical fasteners to an approved backing.

**ANCHORS.** See “Supports.”

**[RB] APPROVED.** Acceptable to the building official.

**APPROVED. (HCD 1)** Meeting the approval of the enforcing agency, except as otherwise provided by law, when used in connection with any system, material, type of construction, fixture or appliance as the result of investigations and tests conducted by the agency, or by reason of accepted principles or tests by national authorities or technical, health, or scientific organizations or agencies.

#### Notes:

1. See Health and Safety Code Section 17920 for “Approved” as applied to residential construction and buildings or structures accessory thereto, as referenced in Section 1.8.2.1.1.
2. See Health and Safety Code Section 17921.1 for “Approved” as applied to the use of hotplates in residential construction referenced in Section 1.8.2.1.1.
3. See Health and Safety Code Section 19966 for “Approved” as applied to factory-built housing as referenced in Section 1.8.3.2.5.
4. See Health and Safety Code Section 18201 for “Approved” as applied to mobilehome parks as referenced in Section 1.8.3.2.2.
5. See Health and Safety Code Section 18862.1 for “Approved” as applied to special occupancy parks as referenced in Section 1.8.3.2.3.

**[RB] APPROVED AGENCY.** An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, where such agency has been

## DEFINITIONS

approved by the building official. (HCD 1) “Approved agency” shall mean “Listing agency” and “Testing agency.”

**APPROVED LISTING AGENCY.** Any agency approved by the enforcing agency, unless otherwise provided by statute, which is in the business of listing and labeling and which makes available at least an annual published report of such listings in which specific information is included that the product has been tested to recognized standards and found to comply.

**APPROVED TESTING AGENCY.** Any agency which is determined by the enforcing agency, except as otherwise provided by statute, to have adequate personnel and expertise to carry out the testing of systems, materials, and construction fixtures or appliances.

**[RB] ASPECT RATIO.** The ratio of longest to shortest perpendicular dimensions, or for wall sections, the ratio of height to length.

**[RB] ATTIC.** The unfinished space between the ceiling assembly and the roof assembly.

**[RB] ATTIC, HABITABLE.** A finished or unfinished area, not considered a story, complying with all of the following requirements:

1. The occupiable floor area is not less than 70 square feet (17 m<sup>2</sup>), in accordance with Section R304.
2. The occupiable floor area has a ceiling height in accordance with Section R305.
3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides and the floor-ceiling assembly below.

**[RB] BASEMENT.** A story that is not a story above grade plane. (see “Story above grade plane”).

**[RB] BASEMENT WALL.** The opaque portion of a wall that encloses one side of a basement and has an average below grade wall area that is 50 percent or more of the total opaque and nonopaque area of that enclosing side.

**[RB] BASIC WIND SPEED.** Three-second gust speed at 33 feet (10 058 mm) above the ground in Exposure C (see Section R301.2.1) as given in Figure R301.2(4)A.

**BEDRIDDEN PERSON.** A person, requiring assistance in turning and repositioning in bed, or being unable to independently transfer to and from bed, except in facilities with appropriate and sufficient care staff, mechanical devices if necessary, and safety precautions as determined in Title 22 regulations, by the Director of Social Services or his or her designated representative. Persons who are unable to independently transfer to and from bed, but who do not need assistance to turn or reposition in bed, shall be considered nonambulatory.

*The Director of Social Services or his or her designated representative shall make the determination of the bedridden status of persons with developmental disabilities, in consultation with the Director of Developmental Services or his or her designated representative.*

*The Director of Social Services or his or her designated representative shall make the determination of the bedridden*

*status of all other persons with disabilities who are not developmentally disabled.*

**[RB] BOND BEAM.** A horizontal grouted element within masonry in which reinforcement is embedded.

**[RB] BRACED WALL LINE.** A straight line through the building plan that represents the location of the lateral resistance provided by the wall bracing.

**[RB] BRACED WALL LINE, CONTINUOUSLY SHEATHED.** A braced wall line with structural sheathing applied to all sheathable surfaces including the areas above and below openings.

**[RB] BRACED WALL PANEL.** A full-height section of wall constructed to resist in-plane shear loads through interaction of framing members, sheathing material and anchors. The panel’s length meets the requirements of its particular bracing method, and contributes toward the total amount of bracing required along its braced wall line in accordance with Section R602.10.1.

**[RB] BUILDING.** Building shall mean any one- and two-family dwelling or portion thereof, including townhouses, that is used, or designed or intended to be used for human habitation, for living, sleeping, cooking or eating purposes, or any combination thereof, and shall include accessory structures thereto.

**Exceptions:** For applications listed in Section 1.8.2 regulated by the Department of Housing and Community Development, “Building” shall not include the following:

1. Any mobilehome as defined in Health and Safety Code Section 18008.
2. Any manufactured home as defined in Health and Safety Code Section 18007.
3. Any commercial modular as defined in Health and Safety Code Section 18001.8 or any special purpose commercial modular as defined in Section 18012.5.
4. Any recreational vehicle as defined in Health and Safety Code Section 18010.
5. Any multifamily manufactured home as defined in Health and Safety Code Section 18008.7.

*For additional information, see Health and Safety Code Section 18908.*

**Note:** Building shall have the same meaning as defined in Health and Safety Code Sections 17920 and 18908 for the applications specified in Section 1.11.

**[RB] BUILDING, EXISTING.** Existing building is a building erected prior to the adoption of this code, or one for which a legal building permit has been issued.

**[RB] BUILDING-INTEGRATED PHOTOVOLTAIC PRODUCT.** A building product that incorporates photovoltaic modules and functions as a component of the building envelope.

**[RB] BUILDING LINE.** The line established by law, beyond which a building shall not extend, except as specifically provided by law.

## CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE CHAPTER 3 – BUILDING PLANNING

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below			X																		
Chapter / Section																					
<i>R300</i>				X																	
<i>R300.1</i>				X																	
<i>R300.2</i>				X																	
R301.1			X																		
<i>R301.1.1.1</i>				X																	
<i>R301.1.3.1</i>				X																	
<i>R301.1.3.2</i>				X																	
<i>R301.1.3.3</i>				X																	
Table R301.2(1)				X																	
R301.2.2.1.1																					
R301.2.2.1.2																					
R301.2.2.3.7				X																	
R302.1 - R302.14			X																		
R302.1				X																	
R302.2				X																	
R302.5.1				X																	
R302.6				X																	
R302.14				X																	
R303.1				X																	
R303.3				X																	
<i>R303.3.1</i>				X																	
R303.4				X																	
R303.7 - R308.1			X																		
<i>R303.8.1.1</i>				X																	
R303.9				X																	
R304.2				X																	
<i>R304.5</i>				X																	
R307.1				X																	
Figure R307.1				†																	
R308.3 - R308.4			X																		
R309.4				X																	
R309.5			X																		
<i>R309.6</i>			X																		
<i>R309.7</i>				X																	
<i>R309.8</i>				X																	
R310 - R310.4			X																		

(continued)

**CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE  
CHAPTER 3 – BUILDING PLANNING—continued**

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt Entire Chapter																					
Adopt Entire Chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below			X																		
Chapter / Section																					
R310.2.2				X																	
R311 - R311.8.3.3			X																		
R312 - R312.2.2			X																		
R312.1.2				X																	
R313 - R313.3.8.2			X	◆																	
R314 - R314.8.3			X																		
R315.1.1				X																	
R315.2				X																	
R315.2.1				X																	
R315.2.2				X																	
R315.3				X																	
R315.4				X																	
R315.5				X																	
R315.6.2				X																	
R315.6.4				X																	
R315.7				X																	
R316			X																		
R319			X																		
R320.1				X																	
R320.1.1				†																	
R321			X																		
R321.3				X																	
R322.1.6				X																	
R322.1.7				X																	
R322.1.9				†																	
R324			X																		
R324.2				X																	
R324.3				X																	
R324.6.1				X																	
R324.7.2.5 Exception				X																	
R326				†																	
R334				X																	
R334.1				X																	
R335 - R335.9			X																		
R336 - R336.8			X																		
R337 - R337.10.4			X																		
R338 - R338.4			X																		
R340				X																	
R340.1				X																	

The state agency does not adopt sections identified with the following symbol: †

The ◆ designation indicates that the State Fire Marshal's adoption of this chapter or individual sections is applicable to structures subject to HCD 1.

is useable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the building or structure in violation of this section.

**R322.1.6 Protection of mechanical, plumbing and electrical systems.** Electrical systems, equipment and components; heating, ventilating, air conditioning; plumbing appliances and plumbing fixtures; duct systems; and other service equipment shall be located at or above the elevation required in Section R322.2 or R322.3. If replaced as part of a substantial improvement, electrical systems, equipment and components; heating, ventilating, air conditioning and plumbing appliances and plumbing fixtures; duct systems; and other service equipment shall meet the requirements of this section. Systems, fixtures, and equipment and components shall not be mounted on or penetrate through walls intended to break away under flood loads.

**Exception:** Locating electrical systems, equipment and components; heating, ventilating, air conditioning; plumbing appliances and plumbing fixtures; duct systems; and other service equipment is permitted below the elevation required in Section R322.2 or R322.3 provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in accordance with ASCE 24. Electrical wiring systems are permitted to be located below the required elevation provided that they conform to the provisions of the *California Electrical Code* for wet locations.

**R322.1.7 Protection of water supply and sanitary sewage systems.** Water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the *water supply and distribution system*. Sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into *sanitary drainage* systems and discharges from *sanitary drainage* systems into floodwaters.

**R322.1.8 Flood-resistant materials.** Building materials and installation methods used for flooring and interior and exterior walls and wall coverings below the elevation required in Section R322.2 or R322.3 shall be flood damage-resistant materials that conform to the provisions of FEMA TB-2.

**R322.1.9 Manufactured homes.** *(Not adopted in CA)*

**R322.1.10 As-built elevation documentation.** A registered design professional shall prepare and seal documentation of the elevations specified in Section R322.2 or R322.3.

**R322.2 Flood hazard areas (including A Zones).** Areas that have been determined to be prone to flooding and that are not subject to high-velocity wave action shall be designated as flood hazard areas. Flood hazard areas that have been delineated as subject to wave heights between 1½ feet (457 mm) and 3 feet (914 mm) or otherwise designated by the jurisdiction shall be designated as Coastal A Zones and are subject to the requirements of Section R322.3. Buildings and structures constructed in whole or in part in flood hazard areas shall be

designed and constructed in accordance with Sections R322.2.1 through R322.2.3.

**R322.2.1 Elevation requirements.**

1. Buildings and structures in flood hazard areas, including flood hazard areas designated as Coastal A Zones, shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher.
2. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including *basement*) elevated to a height above the highest adjacent *grade* of not less than the depth number specified in feet (mm) on the FIRM plus 1 foot (305 mm), or not less than 3 feet (915 mm) if a depth number is not specified.
3. Basement floors that are below grade on all sides shall be elevated to or above base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher.

**Exception:** Enclosed areas below the design flood elevation, including basements with floors that are not below grade on all sides, shall meet the requirements of Section R322.2.2.

**R322.2.2 Enclosed area below design flood elevation.**

Enclosed areas, including crawl spaces, that are below the design flood elevation shall:

1. Be used solely for parking of vehicles, building access or storage.
2. Be provided with flood openings that meet the following criteria and are installed in accordance with Section R322.2.2.1:
  - 2.1. The total net area of openings shall be not less than 1 square inch (645 mm<sup>2</sup>) for each square foot (0.093 m<sup>2</sup>) of enclosed area where the enclosed area is measured on the exterior of the enclosure walls, or the openings shall be designed as engineered openings and the construction documents shall include a statement by a registered design professional that the design of the openings will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters as specified in Section 2.6.2.2 of ASCE 24.
  - 2.2. Openings shall be not less than 3 inches (76 mm) in any direction in the plane of the wall.
  - 2.3. The presence of louvers, blades, screens and faceplates or other covers and devices shall allow the automatic flow of floodwater into and out of the enclosed areas and shall be accounted for in the determination of the net open area.

**R322.2.2.1 Installation of openings.** The walls of enclosed areas shall have openings installed such that:

1. There shall be not less than two openings on different sides of each enclosed area; if a building

has more than one enclosed area below the design flood elevation, each area shall have openings.

2. The bottom of each opening shall be not more than 1 foot (305 mm) above the higher of the final interior grade or floor and the finished exterior grade immediately under each opening.
3. Openings shall be permitted to be installed in doors and windows; doors and windows without installed openings do not meet the requirements of this section.

**R322.2.3 Foundation design and construction.** Foundation walls for buildings and structures erected in flood hazard areas shall meet the requirements of Chapter 4.

**Exception:** Unless designed in accordance with Section R404:

1. The unsupported height of 6-inch (152 mm) plain masonry walls shall be not more than 3 feet (914 mm).
2. The unsupported height of 8-inch (203 mm) plain masonry walls shall be not more than 4 feet (1219 mm).
3. The unsupported height of 8-inch (203 mm) reinforced masonry walls shall be not more than 8 feet (2438 mm).

For the purpose of this exception, unsupported height is the distance from the finished grade of the under-floor space to the top of the wall.

**R322.2.4 Tanks.** Underground tanks shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood. Above-ground tanks shall be installed at or above the elevation required in Section R322.2.1 or shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood.

**R322.3 Coastal high-hazard areas (including V Zones and Coastal A Zones, where designated).** Areas that have been determined to be subject to wave heights in excess of 3 feet (914 mm) or subject to high-velocity wave action or wave-induced erosion shall be designated as coastal high-hazard areas. Flood hazard areas that have been designated as subject to wave heights between 1½ feet (457 mm) and 3 feet (914 mm) or otherwise designated by the jurisdiction shall be designated as Coastal A Zones. Buildings and structures constructed in whole or in part in coastal high-hazard areas and coastal A Zones, where designated, shall be designed and constructed in accordance with Sections R322.3.1 through R322.3.7.

**R322.3.1 Location and site preparation.**

1. New buildings and buildings that are determined to be substantially improved pursuant to Section R105.3.1.1 shall be located landward of the reach of mean high tide.
2. For any alteration of sand dunes and mangrove stands, the building official shall require submission of an engineering analysis that demonstrates that the

proposed alteration will not increase the potential for flood damage.

**R322.3.2 Elevation requirements.**

1. Buildings and structures erected within coastal high-hazard areas and Coastal A Zones, shall be elevated so that the bottom of the lowest horizontal structural members supporting the lowest floor, with the exception of piling, pile caps, columns, grade beams and bracing, is elevated to or above the base flood elevation plus 1 foot (305 mm) or the design flood elevation, whichever is higher.
2. Basement floors that are below grade on all sides are prohibited.
3. The use of fill for structural support is prohibited.
4. Minor grading, and the placement of minor quantities of fill, shall be permitted for landscaping and for drainage purposes under and around buildings and for support of parking slabs, pool decks, patios and walkways.
5. Walls and partitions enclosing areas below the design flood elevation shall meet the requirements of Sections R322.3.4 and R322.3.5.

**R322.3.3 Foundations.** Buildings and structures erected in coastal high-hazard areas and Coastal A Zones shall be supported on pilings or columns and shall be adequately anchored to such pilings or columns. The space below the elevated building shall be either free of obstruction or, if enclosed with walls, the walls shall meet the requirements of Section R322.3.4. Pilings shall have adequate soil penetrations to resist the combined wave and wind loads (lateral and uplift). Water-loading values used shall be those associated with the design flood. Wind-loading values shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R322.3.6. Spread footing, mat, raft or other foundations that support columns shall not be permitted where soil investigations that are required in accordance with Section R401.4 indicate that soil material under the spread footing, mat, raft or other foundation is subject to scour or erosion from wave-velocity flow conditions. If permitted, spread footing, mat, raft or other foundations that support columns shall be designed in accordance with ASCE 24. Slabs, pools, pool decks and walkways shall be located and constructed to be structurally independent of buildings and structures and their foundations to prevent transfer of flood loads to the buildings and structures during conditions of flooding, scour or erosion from wave-velocity flow conditions, unless the buildings and structures and their foundations are designed to resist the additional flood load.

**Exception:** In Coastal A Zones, stem wall foundations supporting a floor system above and backfilled with soil or gravel to the underside of the floor system shall be permitted provided the foundations are designed to account for wave action, debris impact, erosion and



local scour. Where soils are susceptible to erosion and local scour, stem wall foundations shall have deep footings to account for the loss of soil.

**R322.3.4 Walls below design flood elevation.** Walls and partitions are permitted below the elevated floor, provided that such walls and partitions are not part of the structural support of the building or structure and:

1. Electrical, mechanical and plumbing system components are not to be mounted on or penetrate through walls that are designed to break away under flood loads; and
2. Are constructed with insect screening or open lattice; or
3. Are designed to break away or collapse without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. Such walls, framing and connections shall have a resistance of not less than 10 (479 Pa) and not more than 20 pounds per square foot (958 Pa) as determined using allowable stress design; or
4. Where wind loading values of this code exceed 20 pounds per square foot (958 Pa), as determined using allowable stress design, the construction documents shall include documentation prepared and sealed by a registered design professional that:
  - 4.1. The walls and partitions below the design flood elevation have been designed to collapse from a water load less than that which would occur during the base flood.
  - 4.2. The elevated portion of the building and supporting foundation system have been designed to withstand the effects of wind and flood loads acting simultaneously on structural and nonstructural building components. Water-loading values used shall be those associated with the design flood. Wind-loading values shall be those required by this code.
5. Walls intended to break away under flood loads as specified in Item 3 or 4 have flood openings that meet the criteria in Section R322.2.2, Item 2.

**R322.3.5 Enclosed areas below design flood elevation.** Enclosed areas below the design flood elevation shall be used solely for parking of vehicles, building access or storage.

**R322.3.5.1 Protection of building envelope.** An exterior door that meets the requirements of Section R609 shall be installed at the top of stairs that provide access to the building and that are enclosed with walls designed to break away in accordance with Section R322.3.4.

**R322.3.6 Construction documents.** The construction documents shall include documentation that is prepared and sealed by a registered design professional that the design and methods of construction to be used meet the applicable criteria of this section.

**R322.3.7 Tanks.** Underground tanks shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood. Above-ground tanks shall be installed at or above the elevation required in Section R322.3.2. Where elevated on platforms, the platforms shall be cantilevered from or knee braced to the building or shall be supported on foundations that conform to the requirements of Section R322.3.

## SECTION R323 STORM SHELTERS

**R323.1 General.** This section applies to storm shelters where constructed as separate detached buildings or where constructed as safe rooms within buildings for the purpose of providing refuge from storms that produce high winds, such as tornados and hurricanes. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

## SECTION 324 SOLAR ENERGY SYSTEMS

**R324.1 General.** Solar energy systems shall comply with the provisions of this section.

**R324.2 Solar thermal systems.** Solar thermal systems shall be designed and installed in accordance with *the California Plumbing Code* and the *California Fire Code*.

**R324.3 Photovoltaic systems.** Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.1 through R324.7.2.7 and *the California Electrical Code*. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

**R324.3.1 Equipment listings.** Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703.

**R324.4 Rooftop-mounted photovoltaic systems.** Rooftop-mounted photovoltaic panel systems installed on or above the roof covering shall be designed and installed in accordance with Section R907.

**R324.4.1 Roof live load.** Roof structures that provide support for photovoltaic panel systems shall be designed for applicable roof live load. The design of roof structures need not include roof live load in the areas covered by photovoltaic panel systems. Portions of roof structures not covered by photovoltaic panels shall be designed for roof live load. Roof structures that provide support for photovoltaic panel systems shall be designed for live load,  $L_R$ , for the load case where the photovoltaic panel system is not present.

**R324.5 Building-integrated photovoltaic systems.** Building-integrated photovoltaic systems that serve as roof coverings shall be designed and installed in accordance with Section R905.

**R324.5.1 Photovoltaic shingles.** Photovoltaic shingles shall comply with Section R905.16.

**R324.6 Ground-mounted photovoltaic systems.** Ground-mounted photovoltaic systems shall be designed and installed in accordance with Section R301.

**R324.6.1 Fire separation distances.** Ground-mounted photovoltaic systems shall be subject to the fire separation distance requirements determined by the *enforcing agency*.

**R324.7 Access and pathways.** Roof access, pathways and spacing requirements shall be provided in accordance with Sections R324.7.1 through R324.7.2.7.

**Exceptions:**

1. Detached, *nonhabitable Group U Structures including, but not limited to*, garages and accessory structures to one- and two-family dwellings and townhouses, such as parking shade structures, carports, solar trellises and similar structures.
2. Roof access, pathways and spacing requirements need not be provided where an alternative ventilation method approved by the *enforcing agency* has been provided or where the *enforcing agency* has determined that vertical ventilation techniques will not be employed.

**R324.7.1 Roof access points.** Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires or signs.

**R324.7.2 Solar photovoltaic systems.** Solar photovoltaic systems shall comply with Sections R324.7.2.1 through R324.7.2.7.

**R324.7.2.1 Size of solar photovoltaic array.** Each photovoltaic array shall be limited to 150 feet by 150 feet (45 720 by 45 720 mm). Multiple arrays shall be separated by a clear access pathway not less than 3 feet (914 mm) in width.

**R324.7.2.2 Hip roof layouts.** Panels and modules installed on dwellings with hip roof layouts shall be located in a manner that provides a clear access pathway not less than 3 feet (914 mm) in width from the eave to the ridge on each roof slope where panels and modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.

**Exception:** These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

**R324.7.2.3 Single ridge roofs.** Panels and modules installed on dwellings with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels or modules are located.

**Exception:** This requirement shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

**R324.7.2.4 Roofs with hips and valleys.** Panels and modules installed on dwellings with roof hips or valleys shall not be located less than 18 inches (457 mm) from a hip or valley where panels or modules are to be placed on both sides of a hip or valley. Where panels are to be located on one side only of a hip or valley that is of equal length, the 18-inch (457 mm) clearance does not apply.

**Exception:** These requirements shall not apply to roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

**R324.7.2.5 Allowance for smoke ventilation operations.** Panels and modules installed on dwellings shall not be located less than 3 feet (914 mm) below the roof ridge to allow for fire department smoke ventilation operations.

**Exception:** Where an alternative ventilation method approved by the *enforcing agency* has been provided or where the *enforcing agency* has determined that vertical ventilation techniques will not be employed, clearance from the roof ridge is not required.

**R324.7.2.6 Ground-mounted photovoltaic arrays.** *Ground mounted photovoltaic arrays shall comply with this section and the California Electrical Code. Setback requirements shall not apply to ground-mounted, free-standing photovoltaic arrays. A clear, brush-free area of 10 feet (3048 mm) shall be required for ground-mounted photovoltaic arrays.*

**R324.7.2.7 Locations of DC conductors.** *Conduit, wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes the total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays. DC wiring shall be installed in metallic conduit or raceways when located within enclosed spaces in a building. Conduit shall run along the bottom of load bearing members.*

**SECTION R325  
MEZZANINES**

**R325.1 General.** Mezzanines shall comply with Section R325.

**R325.2 Mezzanines.** The clear height above and below mezzanine floor construction shall be not less than 7 feet (2134 mm).

**R325.3 Area limitation.** The aggregate area of a mezzanine or mezzanines shall be not greater than one-third of the floor area of the room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is located.

## CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE CHAPTER 6 – WALL CONSTRUCTION

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X	X																
Adopt only those sections that are listed below																					
Chapter / Section																					
R602.1.1				X																	
<del>R602.3.4.1</del>				X																	
R606.1.1				X																	
R608.1				X																	
R610.1				X																	
R610.4.1 <i>Note</i>				X	X																

## CHAPTER 6 WALL CONSTRUCTION

### SECTION R601 GENERAL

**R601.1 Application.** The provisions of this chapter shall control the design and construction of walls and partitions for buildings.

**R601.2 Requirements.** Wall construction shall be capable of accommodating all loads imposed in accordance with Section R301 and of transmitting the resulting loads to the supporting structural elements.

**R601.2.1 Compressible floor-covering materials.** Compressible floor-covering materials that compress more than  $\frac{1}{32}$  inch (0.8 mm) when subjected to 50 pounds (23 kg) applied over 1 inch square (645 mm) of material and are greater than  $\frac{1}{8}$  inch (3.2 mm) in thickness in the uncompressed state shall not extend beneath walls, partitions or columns, which are fastened to the floor.

### SECTION R602 WOOD WALL FRAMING

**R602.1 General.** Wood and wood-based products used for load-supporting purposes shall conform to the applicable provisions of this section.

**R602.1.1 Sawn lumber.** Sawn lumber shall be identified by a grade mark of an accredited lumber grading or inspection agency and have design values certified by an accreditation body that complies with DOC PS 20. In lieu

of a grade mark, a certification of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.

*Note:* See Section R301.1.1.1 for limited-density owner-built rural dwellings.

**R602.1.2 End-jointed lumber.** Approved end-jointed lumber identified by a grade mark conforming to Section R602.1 shall be permitted to be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire-resistance rating shall have the designation “Heat Resistant Adhesive” or “HRA” included in its grade mark.

**R602.1.3 Structural glued-laminated timbers.** Glued-laminated timbers shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D3737.

**R602.1.4 Structural log members.** Structural log members shall comply with the provisions of ICC 400.

**R602.1.5 Structural composite lumber.** Structural capacities for structural composite lumber shall be established and monitored in accordance with ASTM D5456.

**R602.1.6 Cross-laminated timber.** Cross-laminated timber shall be manufactured and identified as required by ANSI/APA PRG 320.

**R602.1.7 Engineered wood rim board.** Engineered wood rim boards shall conform to ANSI/APA PRR 410 or shall

be evaluated in accordance with ASTM D7672. Structural capacities shall be in accordance with either ANSI/APA PRR 410 or established in accordance with ASTM D7672. Rim boards conforming to ANSI/APA PRR 410 shall be marked in accordance with that standard.

**R602.1.8 Wood structural panels.** Wood structural panel sheathing shall conform to DOC PS 1, DOC PS 2 or, when manufactured in Canada, CSA O437 or CSA O325. Panels shall be identified for grade, bond classification, and performance category by a grade mark or certificate of inspection issued by an approved agency.

**R602.1.9 Particleboard.** Particleboard shall conform to ANSI A208.1. Particleboard shall be identified by the grade mark or certificate of inspection issued by an approved agency.

**R602.1.10 Fiberboard.** Fiberboard shall conform to ASTM C208. Fiberboard sheathing, where used structurally, shall be identified by an approved agency as conforming to ASTM C208.

**R602.2 Grade.** Studs shall be a minimum No. 3, standard or stud grade lumber.

**Exception:** Bearing studs not supporting floors and non-bearing studs shall be permitted to be utility grade lumber, provided the studs are spaced in accordance with Table R602.3(5).

**R602.3 Design and construction.** Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2), or in accordance with AWC NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). Wall sheathing shall be fastened directly to framing members and, where placed on the exterior side of an exterior wall, shall be capable of resisting the wind pressures listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) and shall conform to the requirements of Table R602.3(3). Wall sheathing used only for exterior wall covering purposes shall comply with Section R703.

Studs shall be continuous from support at the sole plate to a support at the top plate to resist loads perpendicular to the wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

**Exception:** Jack studs, trimmer studs and cripple studs at openings in walls that comply with Tables R602.7(1) and R602.7(2).

**R602.3.1 Stud size, height and spacing.** The size, height and spacing of studs shall be in accordance with Table R602.3(5).

**Exceptions:**

1. Utility grade studs shall not be spaced more than 16 inches (406 mm) on center, shall not support more than a roof and ceiling, and shall not exceed

8 feet (2438 mm) in height for exterior walls and load-bearing walls or 10 feet (3048 mm) for interior nonload-bearing walls.

2. Where snow loads are less than or equal to 25 pounds per square foot (1.2 kPa), and the ultimate design wind speed is less than or equal to 130 mph (58.1 m/s), 2-inch by 6-inch (38 mm by 14 mm) studs supporting a roof load with not more than 6 feet (1829 mm) of tributary length shall have a maximum height of 18 feet (5486 mm) where spaced at 16 inches (406 mm) on center, or 20 feet (6096 mm) where spaced at 12 inches (304.8 mm) on center. Studs shall be minimum No. 2 grade lumber.

**R602.3.2 Top plate.** Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset not less than 24 inches (610 mm). Joints in plates need not occur over studs. Plates shall be not less than 2-inches (51 mm) nominal thickness and have a width not less than the width of the studs.

**Exception:** A single top plate used as an alternative to a double top plate shall comply with the following:

1. The single top plate shall be tied at corners, intersecting walls, and at in-line splices in straight wall lines in accordance with Table R602.3.2.
2. The rafters or joists shall be centered over the studs with a tolerance of not more than 1 inch (25 mm).
3. Omission of the top plate is permitted over headers where the headers are adequately tied to adjacent wall sections in accordance with Table R602.3.2.

**R602.3.3 Bearing studs.** Where joists, trusses or rafters are spaced more than 16 inches (406 mm) on center and the bearing studs below are spaced 24 inches (610 mm) on center, such members shall bear within 5 inches (127 mm) of the studs beneath.

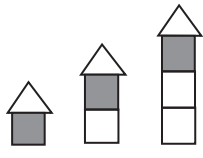
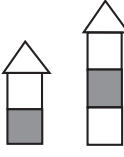

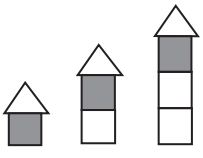
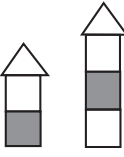

**Exceptions:**

1. The top plates are two 2-inch by 6-inch (38 mm by 140 mm) or two 3-inch by 4-inch (64 mm by 89 mm) members.
2. A third top plate is installed.
3. Solid blocking equal in size to the studs is installed to reinforce the double top plate.

**R602.3.4 Bottom (sole) plate.** Studs shall have full bearing on a nominal 2-by (51 mm) or larger plate or sill having a width not less than to the width of the studs.

**R602.3.4.1 Rodent proofing.** Annular spaces around pipes, electric cables, conduits or other openings in bottom/sole plates at exterior walls shall be protected against the passage of rodents by closing such openings in accordance with the California Green Building Standards Code, Chapter 4, Division 4.4.

TABLE R602.10.3(3)—continued  
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY




<ul style="list-style-type: none"> <li>• SOIL CLASS D<sup>b</sup></li> <li>• WALL HEIGHT = 10 FEET</li> <li>• 10 PSF FLOOR DEAD LOAD</li> <li>• 15 PSF ROOF/CEILING DEAD LOAD</li> <li>• BRACED WALL LINE SPACING ≤ 25 FEET</li> </ul>			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE <sup>a</sup>				
Seismic Design Category	Story Location	Braced Wall Line Length (feet) <sup>c</sup>	Method LIB <sup>d</sup>	Method GB	Methods DWB, SFB, PBS, PCP, HPS, CS-SFB <sup>e</sup>	Method WSP	Methods CS-WSP, CS-G
D <sub>1</sub>		10	NP	3.0	3.0	2.0	1.7
		20	NP	6.0	6.0	4.0	3.4
		30	NP	9.0	9.0	6.0	5.1
		40	NP	12.0	12.0	8.0	6.8
		50	NP	15.0	15.0	10.0	8.5
		10	NP	6.0	6.0	4.5	3.8
		20	NP	12.0	12.0	9.0	7.7
		30	NP	18.0	18.0	13.5	11.5
		40	NP	24.0	24.0	18.0	15.3
		50	NP	30.0	30.0	22.5	19.1
		10	NP	8.5	8.5	6.0	5.1
		20	NP	17.0	17.0	12.0	10.2
		30	NP	25.5	25.5	18.0	15.3
		40	NP	34.0	34.0	24.0	20.4
		50	NP	42.5	42.5	30.0	25.5
D <sub>2</sub>		10	NP	4.0	4.0	2.5	2.1
		20	NP	8.0	8.0	5.0	4.3
		30	NP	12.0	12.0	7.5	6.4
		40	NP	16.0	16.0	10.0	8.5
		50	NP	20.0	20.0	12.5	10.6
		10	NP	7.5	7.5	5.5	4.7
		20	NP	15.0	15.0	11.0	9.4
		30	NP	22.5	22.5	16.5	14.0
		40	NP	30.0	30.0	22.0	18.7
		50	NP	37.5	37.5	27.5	23.4
		10	NP	NP	NP	NP	NP
		20	NP	NP	NP	NP	NP
		30	NP	NP	NP	NP	NP
		40	NP	NP	NP	NP	NP
		50	NP	NP	NP	NP	NP
	Cripple wall below one- or two-story dwelling	10	NP	NP	NP	7.5	6.4
		20	NP	NP	NP	15.0	12.8
		30	NP	NP	NP	22.5	19.1
		40	NP	NP	NP	30.0	25.5
		50	NP	NP	NP	37.5	31.9

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

- Linear interpolation shall be permitted.
- 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 1613.3 of the *California Building Code*.
- Where the braced wall line length is greater than 50 feet, braced wall lines shall be permitted to be divided into shorter segments having lengths of 50 feet or less, and the amount of bracing within each segment shall be in accordance with this table.
- Method LIB shall have gypsum board fastened to not less than one side with nails or screws in accordance with Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches.
- Method CS-SFB does not apply in Seismic Design Categories D<sub>0</sub>, D<sub>1</sub> and D<sub>2</sub>.

WALL CONSTRUCTION

**TABLE R602.10.3(4)  
SEISMIC ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING**

ITEM NUMBER	ADJUSTMENT BASED ON:	STORY	CONDITION	ADJUSTMENT FACTOR <sup>a, b</sup> [Multiply length from Table R602.10.3(3) by this factor]	APPLICABLE METHODS
1	Story height (Section 301.3)	Any story	≤ 10 feet	1.0	All methods
			> 10 feet and ≤ 12 feet	1.2	
2	Braced wall line spacing, townhouses in SDC C	Any story	≤ 35 feet	1.0	
			> 35 feet and ≤ 50 feet	1.43	
3	Braced wall line spacing, in SDC D <sub>0</sub> , D <sub>1</sub> , D <sub>2</sub> <sup>c</sup>	Any story	> 25 feet and ≤ 30 feet	1.2	
			> 30 feet and ≤ 35 feet	1.4	
4	Wall dead load	Any story	> 8 psf and < 15 psf < 8 psf	1.0 0.85	
5	Roof/ceiling dead load for wall supporting	1-, 2- or 3-story building	≤ 15 psf	1.0	
		2- or 3-story building	> 15 psf and ≤ 25 psf	1.1	
		1-story building	> 15 psf and ≤ 25 psf	1.2	
6	Walls with stone or masonry veneer, townhouses in SDC C <sup>d, e</sup>		1.0	All methods	
			1.5		
			1.5		
7	Walls with stone or masonry veneer, detached one- and two-family dwellings in SDC D <sub>0</sub> – D <sub>2</sub> <sup>f</sup>	Any story	See Table R602.10.6.5	BV-WSP	
8	Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.5	DWB, WSP, SFB, PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB

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

- a. Linear interpolation shall be permitted.
- b. The total length of bracing required for a given wall line is the product of all applicable adjustment factors.
- c. The length-to-width ratio for the floor/roof diaphragm shall not exceed 3:1. The top plate lap splice nailing shall be in accordance with Table R602.3(1), Item 13.
- d. Applies to stone or masonry veneer exceeding the first story height.
- e. The adjustment factor for stone or masonry veneer shall be applied to all exterior braced wall lines and all braced wall lines on the interior of the building, backing or perpendicular to and laterally supported veneered walls.
- f. See Section R602.10.6.5 for requirements where stone or masonry veneer does not exceed the first-story height.

# CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE

## CHAPTER 7 – WALL COVERING

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below																					
Chapter / Section																					
R702.7				X																	
R702.7.1				X																	
R703.1.1				X																	

### CHAPTER 7

## WALL COVERING

#### SECTION R701 GENERAL

**R701.1 Application.** The provisions of this chapter shall control the design and construction of the interior and exterior wall covering for all buildings.

**R701.2 Installation.** Products sensitive to adverse weather shall not be installed until adequate weather protection for the installation is provided. Exterior sheathing shall be dry before applying exterior cover.

#### SECTION R702 INTERIOR COVERING

**R702.1 General.** Interior coverings or wall finishes shall be installed in accordance with this chapter and Table R702.1(1),

Table R702.1(2), Table R702.1(3) and Table R702.3.5. Interior masonry veneer shall comply with the requirements of Section R703.7.1 for support and Section R703.7.4 for anchorage, except an airspace is not required. Interior finishes and materials shall conform to the flame spread and smoke-development requirements of Section R302.9.

#### **R702.2 Interior plaster.**

**R702.2.1 Gypsum plaster.** Gypsum plaster materials shall conform to ASTM C5, C22, C28, C35, C59, C61, C587, C631, C847, C933, C1032 and C1047, and shall be installed or applied in compliance with ASTM C843 and C844. Gypsum lath or gypsum base for veneer plaster shall conform to ASTM C1396. Plaster shall be not less than three coats where applied over metal lath and not less than two coats where applied over other bases permitted by this section,

**TABLE R702.1(1)  
THICKNESS OF PLASTER**

PLASTER BASE	FINISHED THICKNESS OF PLASTER FROM FACE OF LATH, MASONRY, CONCRETE (inches)	
	Gypsum Plaster	Cement Plaster
Expanded metal lath	$\frac{5}{8}$ , minimum <sup>a</sup>	$\frac{5}{8}$ , minimum <sup>a</sup>
Wire lath	$\frac{5}{8}$ , minimum <sup>a</sup>	$\frac{3}{4}$ , minimum (interior) <sup>b</sup> $\frac{7}{8}$ , minimum (exterior) <sup>b</sup>
Gypsum lath <sup>g</sup>	$\frac{1}{2}$ , minimum	$\frac{3}{4}$ , minimum (interior) <sup>b</sup>
Masonry walls <sup>c</sup>	$\frac{1}{2}$ , minimum	$\frac{1}{2}$ , minimum
Monolithic concrete walls <sup>c, d</sup>	$\frac{5}{8}$ , maximum	$\frac{7}{8}$ , maximum
Monolithic concrete ceilings <sup>c, d</sup>	$\frac{3}{8}$ , maximum <sup>c</sup>	$\frac{1}{2}$ , maximum
Gypsum veneer base <sup>f, g</sup>	$\frac{1}{16}$ , minimum	$\frac{3}{4}$ , minimum (interior) <sup>b</sup>
Gypsum sheathing <sup>g</sup>	—	$\frac{3}{4}$ , minimum (interior) <sup>b</sup> $\frac{7}{8}$ , minimum (exterior) <sup>b</sup>

For SI: 1 inch = 25.4 mm.

- a. Where measured from back plane of expanded metal lath, exclusive of ribs, or self-furring lath, plaster thickness shall be  $\frac{3}{4}$  inch minimum.
- b. Where measured from face of support or backing.
- c. Because masonry and concrete surfaces vary in plane, thickness of plaster need not be uniform.
- d. Where applied over a liquid bonding agent, finish coat shall be permitted to be applied directly to concrete surface.
- e. Approved acoustical plaster shall be permitted to be applied directly to concrete or over base coat plaster, beyond the maximum plaster thickness shown.
- f. Attachment shall be in accordance with Table R702.3.5.
- g. Where gypsum board is used as a base for cement plaster, a water-resistive barrier complying with Section R703.2 shall be provided.

## WALL COVERING

except that veneer plaster shall be applied in one coat not to exceed  $\frac{3}{16}$  inch (4.76 mm) thickness, provided the total thickness is in accordance with Table R702.1(1).

**R702.2.2 Cement plaster.** Cement plaster materials shall conform to ASTM C91 (Type M, S or N), C150 (Type I, II and III), C595 [Type IP, I (PM), IS and I (SM)], C847, C897, C926, C933, C1032, C1047 and C1328, and shall be installed or applied in compliance with ASTM C1063. Gypsum lath shall conform to ASTM C1396. Plaster shall be not less than three coats where applied over metal lath and not less than two coats where applied over other bases permitted by this section, except that veneer plaster shall be applied in one coat not to exceed  $\frac{3}{16}$  inch (4.76 mm) thickness, provided the total thickness is in accordance with Table R702.1(1).

**R702.2.2.1 Application.** Each coat shall be kept in a moist condition for not less than 24 hours prior to application of the next coat.

**Exception:** Applications installed in accordance with ASTM C926.

**R702.2.2.2 Curing.** The finish coat for two-coat cement plaster shall not be applied sooner than 48 hours after application of the first coat. For three-coat cement plaster, the second coat shall not be applied sooner than 24 hours after application of the first coat. The finish coat for three-coat cement plaster shall not be applied sooner than 48 hours after application of the second coat.

**R702.2.3 Support.** Support spacing for gypsum or metal lath on walls or ceilings shall not exceed 16 inches (406 mm) for  $\frac{3}{8}$ -inch-thick (9.5 mm) or 24 inches (610 mm) for  $\frac{1}{2}$ -inch-thick (12.7 mm) plain gypsum lath. Gypsum lath shall be installed at right angles to support framing with end joints in adjacent courses staggered by not less than one framing space.

### R702.3 Gypsum board and gypsum panel products.

**R702.3.1 Materials.** Gypsum board and gypsum panel product materials and accessories shall conform to ASTM C22, C475, C514, C1002, C1047, C1177, C1178, C1278, C1396 or C658 and shall be installed in accordance with the provisions of this section. Adhesives for the installation of gypsum board and gypsum panel products shall conform to ASTM C557.

**TABLE R702.1(2)  
GYPSUM PLASTER PROPORTIONS<sup>a</sup>**

NUMBER	COAT	PLASTER BASE OR LATH	MAXIMUM VOLUME AGGREGATE PER 100 POUNDS NEAT PLASTER <sup>b</sup> (cubic feet)	
			Damp Loose Sand <sup>a</sup>	Perlite or Vermiculite <sup>c</sup>
Two-coat work	Base coat	Gypsum lath	2.5	2
	Base coat	Masonry	3	3
Three-coat work	First coat	Lath	2 <sup>d</sup>	2
	Second coat	Lath	3 <sup>d</sup>	2 <sup>e</sup>
	First and second coats	Masonry	3	3

For SI: 1 inch = 25.4 mm, 1 cubic foot = 0.0283 m<sup>3</sup>, 1 pound = 0.454 kg.

- Wood-fibered gypsum plaster shall be mixed in the proportions of 100 pounds of gypsum to not more than 1 cubic foot of sand where applied on masonry or concrete.
- Where determining the amount of aggregate in set plaster, a tolerance of 10 percent shall be allowed.
- Combinations of sand and lightweight aggregate shall be permitted to be used, provided the volume and weight relationship of the combined aggregate to gypsum plaster is maintained.
- If used for both first and second coats, the volume of aggregate shall be permitted to be 2.5 cubic feet.
- Where plaster is 1 inch or more in total thickness, the proportions for the second coat may be increased to 3 cubic feet.

**TABLE R702.1(3)  
CEMENT PLASTER PROPORTIONS, PARTS BY VOLUME**

COAT	CEMENT PLASTER TYPE	CEMENTITIOUS MATERIALS				VOLUME OF AGGREGATE PER SUM OF SEPARATE VOLUMES OF CEMENTITIOUS MATERIALS <sup>b</sup>
		Portland Cement Type I, II or III or Blended Cement Type IP, I (PM), IS or I (SM)	Plastic Cement	Masonry Cement Type M, S or N	Lime	
First	Portland or blended	1			$\frac{3}{4} - 1\frac{1}{2}$ <sup>a</sup>	2 $\frac{1}{2}$ - 4
	Masonry			1		2 $\frac{1}{2}$ - 4
	Plastic		1			2 $\frac{1}{2}$ - 4
Second	Portland or blended	1			$\frac{3}{4} - 1\frac{1}{2}$	3 - 5
	Masonry			1		3 - 5
	Plastic		1			3 - 5
Finish	Portland or blended	1			$\frac{3}{4} - 2$	1 $\frac{1}{2}$ - 3
	Masonry			1		1 $\frac{1}{2}$ - 3
	Plastic		1			1 $\frac{1}{2}$ - 3

For SI: 1 inch = 25.4 mm, 1 pound = 0.454 kg.

- Lime by volume of 0 to  $\frac{3}{4}$  shall be used where the plaster will be placed over low-absorption surfaces such as dense clay tile or brick.
- The same or greater sand proportion shall be used in the second coat than used in the first coat.



# CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE

## CHAPTER 8 – ROOF-CEILING CONSTRUCTION

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below			X																		
Chapter / Section																					
R802.1.1 <i>Note</i>				X																	
R802.1.5 - R802.1.5.10			X																		
R802.10.2				X																	
R806.2				X																	
R806.5				X																	
Table R806.5				X																	
R807.1				X																	

## CHAPTER 8

# ROOF-CEILING CONSTRUCTION

### SECTION R801 GENERAL

**R801.1 Application.** The provisions of this chapter shall control the design and construction of the roof-ceiling system for buildings.

**R801.2 Requirements.** Roof and ceiling construction shall be capable of accommodating all loads imposed in accordance with Section R301 and of transmitting the resulting loads to the supporting structural elements.

**R801.3 Roof drainage.** In areas where expansive or collapsible soils are known to exist, all dwellings shall have a controlled method of water disposal from roofs that will collect and discharge roof drainage to the ground surface not less than 5 feet (1524 mm) from foundation walls or to an approved drainage system.

### SECTION R802 WOOD ROOF FRAMING

**R802.1 General.** Wood and wood-based products used for load-supporting purposes shall conform to the applicable provisions of this section.

**R802.1.1 Sawn lumber.** Sawn lumber shall be identified by a grade mark of an accredited lumber grading or inspection agency and have design values certified by an accreditation body that complies with DOC PS 20. In lieu of a grade mark, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.

*Note: See Section R301.1.1.1 for limited-density owner-built rural dwellings.*

**R802.1.1.1 End-jointed lumber.** *Approved* end-jointed lumber identified by a grade mark conforming to Section R802.1.1 shall be permitted to be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire-resistance rating shall have the designation “Heat-Resistant Adhesive” or “HRA” included in its grade mark.

**R802.1.2 Structural glued laminated timbers.** Glued laminated timbers shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D3737.

**R802.1.3 Structural log members.** Structural log members shall comply with the provisions of ICC 400.

**R802.1.4 Structural composite lumber.** Structural capacities for structural composite lumber shall be established and monitored in accordance with ASTM D5456.

**R802.1.5 Fire-retardant-treated wood.** Fire-retardant-treated wood (FRTW) is any wood product that, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E84 or UL 723, a listed flame spread index of 25 or less and shows no evidence of significant progressive combustion where the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.

**R802.1.5.1 Pressure process.** For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) (344.7 kPa).

**R802.1.5.2 Other means during manufacture.** For wood products produced by other means during manufacture the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.

**R802.1.5.3 Testing.** For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section R802.1.5. Testing of only the front and back faces of wood structural panels shall be permitted.

**R802.1.5.4 Labeling.** Fire-retardant-treated lumber and wood structural panels shall be labeled. The label shall contain:

1. The identification mark of an approved agency in accordance with Section 1703.5 of the *California Building Code*.
2. Identification of the treating manufacturer.
3. The name of the fire-retardant treatment.
4. The species of wood treated.
5. Flame spread index and smoke-developed index.
6. Method of drying after treatment.
7. Conformance to applicable standards in accordance with Sections R802.1.5.5 through R802.1.5.10.
8. For FRTW exposed to weather, or a damp or wet location, the words “No increase in the listed classification when subjected to the Standard Rain Test” (ASTM D2898).

**R802.1.5.5 Strength adjustments.** Design values for untreated lumber and wood structural panels as specified in Section R802.1 shall be adjusted for fire-retardant-treated wood. Adjustments to design values shall be based upon an approved method of investigation that takes into consideration the effects of the anticipated temperature and humidity to which the fire-retardant-treated wood will be subjected, the type of treatment and redrying procedures.

**R802.1.5.6 Wood structural panels.** The effect of treatment and the method of redrying after treatment, and exposure to high temperatures and high humidities on the flexure properties of fire-retardant-treated softwood plywood shall be determined in accordance with ASTM D5516. The test data developed by ASTM D5516 shall be used to develop adjustment factors, maximum loads and spans, or both for untreated plywood design values in accordance with ASTM D6305. Each manufacturer shall publish the allowable maximum loads and spans for service as floor and roof sheathing for their treatment.

**R802.1.5.7 Lumber.** For each species of wood treated, the effect of the treatment and the method of redrying after treatment and exposure to high temperatures and high humidities on the allowable design properties of fire-retardant-treated lumber shall be determined in accordance with ASTM D5664. The test data developed by ASTM D5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with ASTM D6841. Each manufacturer shall publish the modification factors for service at temperatures of not less than 80°F (27°C) and for roof framing. The roof framing modification factors shall take into consideration the climatological location.

**R802.1.5.8 Exposure to weather.** Where fire-retardant-treated wood is exposed to weather or damp or wet locations, it shall be identified as “Exterior” to indicate there is not an increase in the listed flame spread index as defined in Section R802.1.5 when subjected to ASTM D2898.

**R802.1.5.9 Interior applications.** Interior fire-retardant-treated wood shall have a moisture content of not over 28 percent when tested in accordance with ASTM D3201 procedures at 92 percent relative humidity. Interior fire-retardant-treated wood shall be tested in accordance with Section R802.1.5.6 or R802.1.5.7. Interior fire-retardant-treated wood designated as Type A shall be tested in accordance with the provisions of this section.

**R802.1.5.10 Moisture content.** Fire-retardant-treated wood shall be dried to a moisture content of 19 percent or less for lumber and 15 percent or less for wood structural panels before use. For wood kiln dried after treatment (KDAT) the kiln temperatures shall not exceed those used in kiln drying the lumber and plywood submitted for the tests described in Section R802.1.5.6 for plywood and R802.1.5.7 for lumber.

**R802.1.6 Cross-laminated timber.** Cross-laminated timber shall be manufactured and identified as required by ANSI/APA PRG 320.

**R802.1.7 Engineered wood rim board.** Engineered wood rim boards shall conform to ANSI/APA PRR 410 or shall be evaluated in accordance with ASTM D7672. Structural capacities shall be in accordance with ANSI/APA PRR 410 or established in accordance with ASTM D7672. Rim boards conforming to ANSI/APA PRR 410 shall be marked in accordance with that standard.

**R802.2 Design and construction.** The framing details required in Section R802 apply to roofs having a minimum slope of three units vertical in 12 units horizontal (25-percent slope) or greater. Roof-ceilings shall be designed and constructed in accordance with the provisions of this chapter and Figures R606.11(1), R606.11(2) and R606.11(3) or in accordance with AWC NDS. Components of roof-ceilings shall be fastened in accordance with Table R602.3(1).

**R802.3 Framing details.** Rafters shall be framed not more than 1½-inch (38 mm) offset from each other to ridge board or directly opposite from each other with a gusset plate as a

# CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE

## CHAPTER 9 – ROOF ASSEMBLIES

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below			X																		
Chapter / Section																					
R901.1			X																		
R902.1 - R902.4			X																		
R903.4.1				X																	
R904.1 - R904.4			X																		
<i>R918</i>			X																		
R905.16				X																	
R907.1				X																	
R909.1				X																	

### CHAPTER 9

## ROOF ASSEMBLIES

#### SECTION R901 GENERAL

**R901.1 Scope.** The provisions of this chapter shall govern the design, materials, construction and quality of roof assemblies.

#### SECTION R902 FIRE CLASSIFICATION

**R902.1 Roofing covering materials.** Roofs shall be covered with materials as set forth in Sections R904 and R905. A *minimum Class A, B or C roofing shall be installed in areas designated by this section* or where the edge of the roof is less than 3 feet (914 mm) from a lot line. Class A, B and C roofing required by this section to be listed shall be tested in accordance with UL 790 or ASTM E108.

**Exceptions:**

1. Class A roof assemblies include those with coverings of brick, masonry and exposed concrete roof deck.
2. Class A roof assemblies include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.
3. Class A roof assemblies include minimum 16 ounces per square foot copper sheets installed over combustible decks.
4. Class A roof assemblies include slate installed over underlayment over combustible decks.

**R902.1.1 Roof coverings within very-high fire hazard severity zones.** *The entire roof covering of every existing*

*structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class A.*

**Exception:** *The requirements shall not apply in any jurisdiction that adopts the model ordinance approved by the State Fire Marshal pursuant to Section 51189 of the Government Code or an ordinance that substantially conforms to the model ordinance and transmits a copy to the State Fire Marshal.*

**R902.1.2 Roof coverings within state responsibility areas.** *The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class B.*

**Exception:** *Areas designated as moderate fire hazard severity zones.*

**R902.1.3 Roof coverings in all other areas.** *The entire roof covering of every existing structure where more than 50 percent of the total roof area is replaced within any one-year period, the entire roof covering of every new structure, and any roof covering applied in the alteration, repair or replacement of the roof of every existing structure, shall be a fire-retardant roof covering that is at least Class C.*

**R902.1.4 Roofing requirements a wildland-urban interface fire area.** Roofing requirements for structures located in a wildland-urban interface fire area shall also comply with Section R337.5.

**R902.2 Fire-retardant-treated shingles and shakes.** Fire-retardant-treated wood shakes and shingles are wood shakes and shingles complying with UBC Standard 15-3 or 15-4 which are impregnated by the full-cell vacuum-pressure process with fire-retardant chemicals, and which have been qualified by UBC Standard 15-2 for use on Class A, B or C roofs. Fire-retardant-treated wood shakes and shingles shall comply with ICC-ES EG107 and with the weathering requirements contained in Health and Safety Code Section 13132.7 (j). Each bundle shall bear labels from an ICBO accredited quality control agency identifying their roof-covering classification and indicating their compliance with ICC-ES EG107 and with the weathering requirements contained in Health and Safety Code Section 13132.7 (j).

Health and Safety Code Section 13132.7 (j) No wood roof covering materials shall be sold or applied in this state unless both of the following conditions are met:

- (1) The materials have been approved and listed by the State Fire Marshal as complying with the requirements of this section.
- (2) The materials have passed at least five years of the 10-year natural weathering test. The 10-year natural weathering test required by this subdivision shall be conducted in accordance with Standard 15-2 of the 1994 edition of the Uniform Building Code at a testing facility recognized by the State Fire Marshal.

**R902.3 Building-integrated photovoltaic product.** Building-integrated photovoltaic products installed as the roof covering shall be tested, listed and labeled for fire classification in accordance with Section R902.1 through R902.1.4.

**R902.4 Rooftop-mounted photovoltaic panels and modules.** Rooftop-mounted photovoltaic panel systems installed on or above the roof covering shall be tested, listed and identified with a fire classification in accordance with UL 1703. Class A, B or C photovoltaic panels and modules shall be installed areas designated by this section, in jurisdictions designated by law as requiring their use, or where the edge of the roof is less than 3 feet (914 mm) from a lot line.

## SECTION R903 WEATHER PROTECTION

**R903.1 General.** Roof decks shall be covered with approved roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof assemblies shall be designed and installed in accordance with this code and the approved manufacturer's instructions such that the roof assembly shall serve to protect the building or structure.

**R903.2 Flashing.** Flashings shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

**R903.2.1 Locations.** Flashings shall be installed at wall and roof intersections, wherever there is a change in roof

slope or direction and around roof openings. A flashing shall be installed to divert the water away from where the eave of a sloped roof intersects a vertical sidewall. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet).

**R903.2.2 Crickets and saddles.** A cricket or saddle shall be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

**Exception:** Unit skylights installed in accordance with Section R308.6 and flashed in accordance with the manufacturer's instructions shall be permitted to be installed without a cricket or saddle.

**R903.3 Coping.** Parapet walls shall be properly coped with noncombustible, weatherproof materials of a width not less than the thickness of the parapet wall.

**R903.4 Roof drainage.** Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof.

**R903.4.1 Secondary (emergency overflow) drains or scuppers.** Where roof drains are required, secondary emergency overflow roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains and having a minimum opening height of 4 inches (102 mm) shall be installed in the adjacent parapet walls with the inlet flow located 2 inches (51 mm) above the low point of the roof served. The installation and sizing of overflow drains, leaders and conductors shall comply with the *California Plumbing Code*.

## SECTION R904 MATERIALS

**R904.1 Scope.** The requirements set forth in this section shall apply to the application of roof covering materials specified herein. Roof assemblies shall be applied in accordance with this chapter and the manufacturer's installation instructions. Installation of roof assemblies shall comply with the applicable provisions of Section R905.

**R904.2 Compatibility of materials.** Roof assemblies shall be of materials that are compatible with each other and with the building or structure to which the materials are applied.

**R904.3 Material specifications and physical characteristics.** Roof covering materials shall conform to the applicable standards listed in this chapter.

**R904.4 Product identification.** Roof covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required. Bulk shipments of materials shall be accompanied by the same information issued in the form of a certificate or on a bill of lading by the manufacturer.

# CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE

## CHAPTER 10 – CHIMNEYS AND FIREPLACES

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC-CG	SFM	HCD			DSA			OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)				X																	
Adopt only those sections that are listed below			X																		
Chapter / Section																					
R1001.3				X																	
R1001.4				X																	
Table R1001.1, Footnote (b)				X																	
R1003.3				X																	
R1003.4				X																	
R1003.9.2			X																		
R1003.11.3				X																	
R1003.14				X																	
R1004.1.1				X																	

## CHAPTER 10

### CHIMNEYS AND FIREPLACES

#### SECTION R1001 MASONRY FIREPLACES

**R1001.1 General.** Masonry fireplaces shall be constructed in accordance with this section and the applicable provisions of Chapters 3 and 4.

**R1001.2 Footings and foundations.** Footings for masonry fireplaces and their chimneys shall be constructed of concrete or solid masonry not less than 12 inches (305 mm) thick and shall extend not less than 6 inches (152 mm) beyond the face of the fireplace or foundation wall on all sides. Footings shall be founded on natural, undisturbed earth or engineered fill below frost depth. In areas not subjected to freezing, footings shall be not less than 12 inches (305 mm) below finished grade.

**R1001.2.1 Ash dump cleanout.** Cleanout openings located within foundation walls below fireboxes, when provided, shall be equipped with ferrous metal or masonry doors and frames constructed to remain tightly closed except when in use. Cleanouts shall be accessible and located so that ash removal will not create a hazard to combustible materials.

**R1001.3 Seismic reinforcing.** Masonry or concrete chimneys in all structures regulated by this code assigned to Seismic Design Category C, D<sub>0</sub>, D<sub>1</sub> or D<sub>2</sub> shall be reinforced. Reinforcing shall conform to the requirements set forth in Table R1001.1 and Section R606.

**R1001.3.1 Vertical reinforcing.** For chimneys up to 40 inches (1016 mm) wide, four No. 4 continuous vertical bars shall be placed between wythes of solid masonry or within the cells of hollow unit masonry and grouted in accordance with Section R606. 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.

**R1001.3.2 Horizontal reinforcing.** Vertical reinforcement shall be placed within 1/4-inch (6.4 mm) ties, or other reinforcing of equivalent net cross-sectional area, placed in the bed joints in accordance with Section R606 at not less than every 18 inches (457 mm) of vertical height. Two such ties shall be installed at each bend in the vertical bars.

**R1001.4 Seismic anchorage.** Masonry or concrete chimneys in all structures regulated by this code assigned to Seismic Design Category C, D<sub>0</sub>, D<sub>1</sub> or D<sub>2</sub> shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade, except where constructed completely within the exterior walls. Anchorage shall conform to the requirements of Section R1001.4.1.

**R1001.4.1 Anchorage.** Two 3/16-inch by 1-inch (5 mm by 25 mm) straps shall be embedded not less than 12 inches (305 mm) into the chimney. Straps shall be hooked around the outer bars and extend 6 inches (152 mm) beyond the bend. Each strap shall be fastened to not less than four floor ceiling or floor joists or rafters with two 1/2-inch (12.7 mm) bolts.

**R1001.4.1.1 Cold-formed steel framing.** Where cold-formed steel framing is used, the location where the 1/2-inch (12.7 mm) bolts are used to attach the straps to the

CHIMNEYS AND FIREPLACES

TABLE R1001.1  
SUMMARY OF REQUIREMENTS FOR MASONRY FIREPLACES AND CHIMNEYS

ITEM	LETTER <sup>a</sup>	REQUIREMENTS
Hearth slab thickness	A	4"
Hearth extension (each side of opening)	B	8" fireplace opening < 6 square foot. 12" fireplace opening ≥ 6 square foot.
Hearth extension (front of opening)	C	16" fireplace opening < 6 square foot. 20" fireplace opening ≥ 6 square foot.
Hearth slab reinforcing	D	Reinforced to carry its own weight and all imposed loads.
Thickness of wall of firebox	E	10" solid brick or 8" where a firebrick lining is used. Joints in firebrick 1/4" maximum.
Distance from top of opening to throat	F	8"
Smoke chamber wall thickness Unlined walls	G	6" 8"
Chimney Vertical reinforcing <sup>b</sup>	H	Four No. 4 full-length bars for chimney up to 40" wide. Add two No. 4 bars for each additional 40" or fraction of width or each additional flue.
Horizontal reinforcing	J	1/4" ties at 18" and two ties at each bend in vertical steel.
Bond beams	K	No specified requirements.
Fireplace lintel	L	Noncombustible material.
Chimney walls with flue lining	M	Solid masonry units or hollow masonry units grouted solid with not less than 4-inch nominal thickness.
Distances between adjacent flues	—	See Section R1003.13.
Effective flue area (based on area of fireplace opening)	P	See Section R1003.15.
Clearances Combustible material Mantel and trim Above roof	R	See Sections R1001.11 and R1003.18. See Section R1001.11, Exception 4. 3' at roofline and 2' at 10'.
Anchorage <sup>b</sup> Strap Number Embedment into chimney Fasten to Bolts	S	3/16" × 1" Two 12" hooked around outer bar with 6" extension. 4 joists Two 1/2" diameter.
Footing Thickness Width	T	12" min. 6" each side of fireplace wall.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>.

**Note:** This table provides a summary of major requirements for the construction of masonry chimneys and fireplaces. Letter references are to Figure R1001.1, which shows examples of typical construction. This table does not cover all requirements, nor does it cover all aspects of the indicated requirements. For the actual mandatory requirements of the code, see the indicated section of text.

a. The letters refer to Figure R1001.1.

b. Not required in Seismic Design Category A or B.

framing shall be reinforced with not less than a 3-inch × 3-inch × 0.229-inch (76 mm × 76 mm × 5.8 mm) steel plate on top of the strap that is screwed to the framing with not fewer than seven No. 6 screws for each bolt.

**R1001.5 Firebox walls.** Masonry fireboxes shall be constructed of solid masonry units, hollow masonry units grouted solid, stone or concrete. Where a lining of firebrick not less than 2 inches (51 mm) thick or other approved lining is provided, the minimum thickness of back and side-walls shall each be 8 inches (203 mm) of solid masonry, including the lining. The width of joints between firebricks shall not be greater than 1/4 inch (6.4 mm). Where a lining is not provided, the total minimum thickness of back and side

walls shall be 10 inches (254 mm) of solid masonry. Firebrick shall conform to ASTM C27 or C1261 and shall be laid with medium duty refractory mortar conforming to ASTM C199.

**R1001.5.1 Steel fireplace units.** Installation of steel fireplace units with solid masonry to form a masonry fireplace is permitted when installed either in accordance with the requirements of their listing or the requirements of this section. Steel fireplace units incorporating a steel firebox lining shall be constructed with steel not less than 1/4 inch (6.4 mm) thick, and an air-circulating chamber that is ducted to the interior of the building. The firebox lining shall be encased with solid masonry to provide a total

## CALIFORNIA RESIDENTIAL CODE – MATRIX ADOPTION TABLE CHAPTER 44 – REFERENCED STANDARDS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.  
See Chapter 1 for state agency authority and building applications.)

Adopting agency	BSC	BSC- CG	SFM	HCD			DSA			OSHDP				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
				1	2	1/AC	AC	SS	SS/ CC	1	2	3	4								
Adopt entire chapter																					
Adopt entire chapter as amended (amended sections listed below)			X	X																	
Adopt only those sections that are listed below																					
Chapter / Section																					
ANSI			X																		
ASTM			X																		
IBC-15				X																	
IPC-15				X																	
IPSDC-15				X																	
ICC			X																		
NFPA			X																		
SFM			X																		
UBC			X																		

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# HISTORY NOTE APPENDIX

## California Residential Code Title 24, Part 2.5, California Code of Regulations (CCR)

For prior code history, see the History Note Appendix to the *California Residential Code*, 2013 Triennial Edition, effective January 1, 2014.

1. (HCD 02/15, SFM 05/15) - Adopt the 2015 edition of the *International Residential Code* published by the International Code Council, for incorporation into the 2016 *California Residential Code*, CCR Title 24, Part 2.5 with amendments for State regulated occupancies, effective on January 1, 2017.
2. Errata to correct editorial errors within the preface as well as throughout various chapters in this code. Effective January 1, 2017.

