

Chapter 15 - Roof Assemblies and Rooftop Structures

2001 CBC	PROPOSED ADOPTION	OSHPD				DSA-SS	Comments
		1	2	3	4		
	Adopt entire chapter without amendments			X			
	Adopt entire chapter with amendments listed below	X	X		X	X	
	Adopt only those sections listed below						
	<i>1507.3.10 CA</i>	X	X		X	X	
	1507.7.6 <i>1507.7.7 CA</i>	X	X		X	X	
	<i>1511 CA</i>	X	X		X	X	
<i>1507.1.1.1</i>	<i>1511.1 CA</i>	X	X		X	X	Relocated existing California Building Standards into IBC format
<i>1507.1.1.2</i>	<i>1511.2 CA</i>	X	X		X	X	Relocated existing California Building Standards into IBC format
<i>1507.1.1.3</i>	<i>1511.3 CA</i>	X	X		X	X	Relocated existing California Building Standards into IBC format
<i>1507.7.1</i>	<i>1511.4 CA</i>	X	X		X	X	Relocated existing California Building Standards into IBC format
<i>1507.11.1</i>	<i>1511.5 CA</i>	X	X		X	X	Relocated existing California Building Standards into IBC format
	<i>15116.6 CA</i>	X	X		X	X	

REPEAL OF EXISTING CALIFORNIA AMENDMENTS IN PART OR IN WHOLE THAT ARE NO LONGER NECESSARY AS FOLLOWS:

~~2001 CBC SECTION 1501~~ — SCOPE: Repeal all amendments in this section.

~~2001 CBC SECTION 1505~~ — ATTICS: ACCESS, DRAFT STOPS AND VENTILATION: Repeal all amendments in this section.

2001 CBC SECTION 1507 – ROOF COVERING MATERIALS AND APPLICATION: Repeal amendment in the following subsection.

~~1507.1.1.4 and 1507.8~~

2001 CBC CHAPTER 15 TABLES: Repeal all amendments in following tables.

~~Tables 15-B-1, 15-B-2, 15-C, 15-D-1.1, 15-D-2.1 and 15-E.~~

Notation [For DSA-SS]:

Authority: Education Code Sections 17310, 81142; Health & Safety Code Section 16022

Reference(s): Education Code Sections 17280 - 17317, and 811130 - 81149; Health & Safety Code Sections 16000 – 16023

Notation [For OSHPD]:

Authority: Health and Safety Code Section 129850

Reference: Health and Safety Code Sections 1275, 129850 and 129790

EXPRESS TERMS

SECTION 1501 - GENERAL

1501.1 Scope. The provisions of this chapter shall govern the design, materials, construction and quality of roof assemblies, and rooftop structures.

SECTION 1502 - DEFINITIONS

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SECTION 1503 - WEATHER PROTECTION

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~~[P]~~ **1503.4 Roof drainage.** Design and installation of roof drainage systems shall comply with the ~~International~~ California Plumbing Code.

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Notation [For DSA-SS]:

Authority: Education Code Sections 17310, 81142; Health & Safety Code Section 16022

Reference(s): Education Code Sections 17280 - 17317, and 811130 - 81149; Health & Safety Code Sections 16000 – 16023

Notation [For OSHPD]:

Authority: Health and Safety Code Section 129850

Reference: Health and Safety Code Sections 1275, 129850 and 129790

SECTION 1504 - PERFORMANCE REQUIREMENTS

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SECTION 1505 - FIRE CLASSIFICATION

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SECTION 1506 - MATERIALS

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SECTION 1507 - REQUIREMENTS FOR ROOF COVERINGS

1507.1 Scope. Roof coverings shall be applied in accordance with the applicable provisions of this section and the manufacturer's installation instructions.

1507.2 Asphalt shingles.

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1507.3 Clay and concrete tile. The installation of clay and concrete tile shall comply with the provisions of this section.

1507.3.1 Deck requirements. Concrete and clay tile shall be installed only over solid sheathing or spaced structural sheathing boards.

1507.3.2 Deck slope. Clay and concrete roof tile shall be installed on roof slopes of 2½ units vertical in 12 units horizontal (21-percent slope) or greater. For roof slopes from 2½ units vertical in 12 units horizontal (21-percent slope) to four units vertical in 12 units horizontal (33-percent slope), double underlayment application is required in accordance with Section 1507.3.3.

1507.3.3 Underlayment.

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1507.3.4 Clay tile. Clay roof tile shall comply with ASTM C 1167.

1507.3.5 Concrete tile. Concrete roof tile shall comply with ASTM C 1492.

1507.3.6 Fasteners. Tile fasteners shall be corrosion resistant and not less than 11 gage, 5/16-inch (8.0 mm) head, and of sufficient length to penetrate the deck a minimum of 0.75 inch (19.1 mm) or through the thickness of the deck, whichever is less. Attaching wire for clay or concrete tile shall not be smaller than 0.083 inch (2.1 mm). Perimeter fastening areas include three tile courses but not less than 36 inches (914 mm) from either side of hips or ridges and edges of eaves and gable rakes.

1507.3.7 Attachment. Clay and concrete roof tiles shall be fastened in accordance with Table 1507.3.7.

TABLE 1507.3.7 - CLAY AND CONCRETE TILE ATTACHMENT ^{a, b, c}

GENERAL — CLAY OR CONCRETE ROOF TILE				
Maximum basic wind speed (mph)	Mean roof height (feet)	Roof slope up to < 3:12	Roof slope 3:12 and over	
85	0-60	One fastener per tile. Flat tile without vertical laps, two fasteners per tile.	Two fasteners per tile. Only one fastener on slopes of 7:12 and less for tiles with installed weight exceeding 7.5 lbs./sq. ft. having a width no greater than 16 inches.	
100	0-40			
100	> 40-60	The head of all tiles shall be nailed. The nose of all eave tiles shall be fastened with approved clips. All rake tiles shall be nailed with two nails. The nose of all ridge, hip and rake tiles shall be set in a bead of roofer's mastic.		
110	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.		
120	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.		
130	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.		
All	> 60	The fastening system shall resist the wind forces in Section 1609.5.2.		
INTERLOCKING CLAY OR CONCRETE ROOF TILE WITH PROJECTING ANCHOR LUGS ^{d, e} (Installations on spaced/solid sheathing with battens or spaced sheathing)				
Maximum basic wind speed (mph)	Mean roof height (feet)	Roof slope up to < 5:12	Roof slope 5:12 < 12:12	Roof slope 12:12 and over
85	0-60	Fasteners are not required. Tiles with installed weight less than 9 lbs./sq. ft. require a minimum of one fastener per tile.	One fastener per tile every other row. All perimeter tiles require one fastener. Tiles with installed weight less than 9 lbs./sq. ft. require a minimum of one fastener per tile.	One fastener required for every tile. Tiles with installed weight less than 9 lbs./sq. ft. require a minimum of one fastener per tile.
100	0-40			
100	> 40-60	The head of all tiles shall be nailed. The nose of all eave tiles shall be fastened with approved clips. All rake tiles shall be nailed with two nails. The nose of all ridge, hip and rake tiles shall be set in a bead of roofers's mastic.		
110	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.		
120	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.		
130	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.		
All	> 60	The fastening system shall resist the wind forces in Section 1609.5.2.		
INTERLOCKING CLAY OR CONCRETE ROOF TILE WITH PROJECTING ANCHOR LUGS (Installations on solid sheathing without battens)				
Maximum	Mean roof	All roof slopes		

basic wind speed (mph)	height (feet)	
85	0-60	One fastener per tile.
100	0-40	One fastener per tile.
100	> 40-60	The head of all tiles shall be nailed. The nose of all eave tiles shall be fastened with approved clips. All rake tiles shall be nailed with two nails The nose of all ridge, hip and rake tiles shall be set in a bead of roofer's mastic.
110	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.
120	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.
130	0-60	The fastening system shall resist the wind forces in Section 1609.5.2.
All	> 60	The fastening system shall resist the wind forces in Section 1609.5.2.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s, 1 pound per square foot = 4.882 kg/m².

- a. Minimum fastener size. Corrosion-resistant nails not less than No. 11 gage with ⁵/₁₆-inch head. Fasteners shall be long enough to penetrate into the sheathing 0.75 inch or through the thickness of the sheathing, whichever is less. Attaching wire for clay and concrete tile shall not be smaller than 0.083 inch.
- b. Snow areas. A minimum of two fasteners per tile are required or battens and one fastener.
- c. Roof slopes greater than 24:12. The nose of all tiles shall be securely fastened.
- d. Horizontal battens. Battens shall be not less than 1 inch by 2 inch nominal. Provisions shall be made for drainage by a minimum of ¹/₈-inch riser at each nail or by 4-foot-long battens with at least a 0.5-inch separation between battens. Horizontal battens are required for slopes over 7:12.
- e. Perimeter fastening areas include three tile courses but not less than 36 inches from either side of hips or ridges and edges of eaves and gable rakes.

1507.3.8 Application.

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1507.3.9 Flashing.

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1507.3.10 [For DSA-SS and OSHPD 1, 2 and 4] Additional requirements. *In addition to the requirements of 1507.3.6 and 1507.3.7, the installation of clay and concrete tile roof coverings shall comply with seismic anchorage provisions of Section 1511.*

Notation [For DSA-SS]:

Authority: Education Code Sections 17310, 81142; Health & Safety Code Section 16022

Reference(s): Education Code Sections 17280 - 17317, and 811130 - 81149; Health & Safety Code Sections 16000 – 16023

Notation [For OSHPD]:

Authority: Health and Safety Code Section 129850

Reference: Health and Safety Code Sections 1275, 129850 and 129790

1507.4 Metal roof panels.

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1507.5 Metal roof shingles.

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1507.6 Mineral-surfaced roll roofing.

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1507.7 Slate shingles. The installation of slate shingles shall comply with the provisions of this section.

1507.7.1 Deck requirements. Slate shingles shall be fastened to solidly sheathed roofs.

1507.7.2 Deck slope. Slate shingles shall only be used on slopes of four units vertical in 12 units horizontal (4:12) or greater.

1507.7.3 Underlayment.

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1507.7.4 Material standards. Slate shingles shall comply with ASTM C 406.

1507.7.5 Application. Minimum headlap for slate shingles shall be in accordance with Table 1507.7.5. Slate shingles shall be secured to the roof with two fasteners per slate.

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1507.7.6 1507.7.7 [For DSA-SS and OSHPD 1, 2 and 4] Additional requirements. *In addition to the requirements of 1507.3.6 and 1507.3.7, the installation of slate shingle roof coverings shall comply with seismic anchorage provisions of Section 1511.*

1507.8 Wood shingles.

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1507.9 Wood shakes.

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1507.10 Built-up roofs.

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1507.11 Modified bitumen roofing.

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1507.12 Thermoset single-ply roofing.

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1507.13 Thermoplastic single-ply roofing.

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1507.14 Sprayed polyurethane foam roofing.

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1507.15 Liquid-applied coatings.

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SECTION 1508 - ROOF INSULATION

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SECTION 1509 - ROOFTOP STRUCTURES

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SECTION 1510 - REROOFING

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[FOR DSA-SS AND OSHPD 1, 2 AND 4] SECTION 1511 - SEISMIC ANCHORAGE OF SLATE SHINGLE, CLAY AND CONCRETE TILE ROOF COVERINGS.

1511.1 (Relocated from 1507.1.1.1, 2001 CBC) Fasteners. Nails shall be as set forth herein or in Tables 15-B-1 and 15-B-2 and shall be long enough to penetrate into the sheathing 3/4 inch (19 mm). Where sheathing is less than 3/4 inch (19 mm) in thickness, nails shall be driven into supports, unless nails with ring shanks are used.

~~Built-up roofing nails for wood board deck shall be No. 12 gage, 7/16 inch (11 mm) head, driven through tin caps or approved nails with integral caps. For plywood, use No. 11 gage ring shank nails driven through tin caps or approved nails with integral caps. For gypsum decks, insulating concrete, cementitious wood fiber and others, fasteners recommended by the deck manufacturer and acceptable to the enforcement agency shall be used.~~

All fasteners shall be corrosion resistant and fabricated of copper, stainless steel, or brass, or shall have a hot dipped galvanized coating not less than 1.0 ounce of zinc per square foot (458 gm/m²).

~~Tin caps or integral caps shall not be smaller than 1 inch (25mm).~~

Nails for slate shingles and clay or concrete tile shall be copper, brass or stainless steel with gage and length per common ferrous nails.

1511.2 (Relocated from 1507.1.1.2, 2001 CBC) Wire. Wire for attaching slate shingles and clay or concrete tile shall be copper, brass or stainless steel capable of supporting four times the weight of tile.

Wire supporting a single tile or shingle shall not be smaller than 1/16 inch (1.6 mm) in diameter. Continuous wire ties supporting more than one tile shall not be smaller than 0.084 inch (2 mm) in diameter.

1511.3 (Relocated from 1507.1.1.3, 2001 CBC) Metal strips. Metal strips for attaching slate shingles and clay or concrete tile shall be copper, brass or stainless steel capable of supporting four times the weight of tile.

1511.4 (Relocated from 1507.7.1, 2001 CBC) Clay or Concrete Tiles. Clay or concrete tile shall be installed in accordance with ~~UBC Standard 15-5~~ Table 1507.3.7 and as described herein.

~~Clay or concrete tile shall be installed in accordance with Tables 15-D-1 and 15-D-2, and as described herein.~~

1. On wood roofs or roofs of other material to which wood strips are secured, every cover or top tile when fastened with nails shall be nailed directly into 1-1/4 inches (32 mm) sound grain soft wood strips of sufficient height to support the tile.

~~Pan or bottom tiles shall be nailed directly to the roof sheathing or to wood strips. Wood strips shall be secured to the roof by nails spaced not over 12 inches (305 mm) apart.~~

2. On concrete roofs, wires shall be secured in place by wire loops embedded into the concrete not less than 2 inches (51 mm). The wire loops shall be spaced not more than 36 inches (914 mm) on center parallel to the eaves, and spaced vertically to allow for the minimum 3 inches (76 mm) lapping of the tile.
3. Where continuous ties of twisted wire, interlocking wires or metal strips extending from the ridge to eave are used to attach tile, the ties shall be attached to the roof construction at the ridge, eave, and at intervals not exceeding 10 feet 0 inch (3048 mm) on center. The ties within 2 feet 0 inch (610 mm) of the rake shall be attached at intervals of 5 feet 0 inch (1524 mm).

Attachment for continuous ties shall be nails, screws, staples or approved clips of the same material as the ties and shall not be subjected to withdrawal forces. Attachments for continuous ties shall have an allowable working stress shear resistance of not less than twice the dead weight of the tile tributary to the attachment, but not less than 300 pounds (136 kg).

4. Tile with projecting anchor lugs at the bottom of the tiles shall be held in position by means of 1-inch by 2-inch (25mm by 51mm) wood stripping nailed to the roof sheathing over the underlay.

~~Tile roofs shall have an underlayment of not less than two layers of Type 15 felt or one layer of Type 30 felt.~~

5. Clay or concrete tile on roofs with slopes exceeding 24 units vertical in 12 units horizontal (200% slope) shall be attached as required for veneer in Chapter 14 A-. The nose of all tiles shall be securely fastened.
6. ~~(Relocated from Table 15-D-1.1, 2001 CBC)~~ Clay or concrete tile shall have a minimum of two fasteners per tile. Tiles that are 8 inches (203 mm) in width or less are permitted to be fastened at the center of the head with one fastener per tile.
7. ~~(Relocated from Table 15-D-2.1, 2001 CBC)~~ Interlocking clay or concrete tile shall have a minimum of one nail near center of head or two wire ties per tile.

1511.5 ~~(Relocated from 1507.11.1, 2001 CBC)~~ **Slate Shingles.** Slate shingles on roofs with slopes exceeding 24 units vertical in 12 units horizontal (200% slope) shall be attached as required for veneer per Chapter 14 A-.

1511.6 Alternative Design. An alternative design of the fastening system used to resist seismic loads is permitted, provided that an engineering analysis or test report based on cyclic testing is provided to the enforcement agency.

The fastening system shall be designed to resist seismic forces per ASCE 7, Section 13.3. Testing of alternative fastening system shall comply with ASCE 7, Section 13.2.5.

Notation [For DSA-SS]:

Authority: Education Code Sections 17310, 81142; Health & Safety Code Section 16022

Reference(s): Education Code Sections 17280 - 17317, and 811130 - 81149; Health & Safety Code Sections 16000 – 16023

Notation [For OSHPD]:

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