

California fire standards and exterior wood products

Solid wood products meet wildfire protection regulations. On January 1, 2008, California implemented requirements for building materials, systems and assemblies used in the exterior design and construction of new buildings within designated Fire Hazard Severity Zones (FHSZ). These regulations and standards, initiated by the California State Fire Marshal's Office (OSFM), created new requirements under Chapter 7A, "Materials and Construction Methods for Exterior

Wildfire Exposure" of the California Building Code (CBC) and cover exterior wood products such as siding, decking and soffits. The full standard is available online at http://www.fire.ca.gov/fire_prevention/downloads/2007_CBC_Ch7A.pdf.

The wood species and products listed in this publication have been successfully fire-tested or accepted in the OSFM's WUI Products Handbook as meeting the CBC Chapter 7A for construction in FHSZ.

FLAME SPREAD RATINGS

Western lumber species flame-spread ratings tested in accordance with ASTM E84		Class B 26-75, Class C 76-200		
Western Larch - 45	Port Orford Cedar - 60	Pacific Silver Fir - 69	Idaho White Pine - 82	Ponderosa Pine - 115
Alaska Yellow Cedar - 50	Incense Cedar - 65	Western Red Cedar - 69	Douglas Fir - 90	
Engelmann Spruce - 55	Redwood - 65	West Coast Hemlock - 73	Sugar Pine - 95	
Hem-Fir - 60	White Fir - 65	Sitka Spruce - 74	Lodgepole Pine - 98	

PRODUCT REQUIREMENTS

If not otherwise stated, all approved products must meet these requirements and be installed as defined.

Siding

Lumber sizes: Minimum nominal 1" thickness in basic profile by minimum nominal 6" width.

Lumber grades: No through holes or loose knots.

Installation: Install horizontally over 7/16" minimum thickness structural plywood or oriented strand board (OSB). Butt joints between pieces should be staggered a minimum of 12" and all butt joints should be flush or mitered with no gap. Nail joints into the studs or blocking members. One nail at each crossing with the wood frame support member shall be used for nominal 6" width siding and two nails for nominal 8" and wider siding as appropriate (see nailing pattern diagram on page 3).

Nails and Nailing: Nails shall be corrosion-resistant and preferably rust proof. Unless noted otherwise, recommended penetration into lumber stud or blocking, or into a combination of wood sheathing and these members, is 1-1/2". Minimum penetration is 1-1/4" with ring shank nails.

Decking

Includes decking surfaces, stair treads, risers and landing of decks, porches and balconies. Chapter 7A contains no fire performance requirements for structural members supporting exterior wood decks, porches and balconies (see Section 704A.4.2) unless considered a floor projection, cantilevered or overhanging appendage.

Lumber sizes: Minimum nominal 2" thickness or as tested.

Lumber grades: Redwood - Construction Common & Better, Commercial Decking & Better; Cedars - 3 Common & Better, Commercial Decking & Better.

Installation: Install over solid wood joists spacing 24" or less on center.

Soffits

Lumber sizes: Minimum nominal 1" thickness in basic profile by minimum nominal 6" width.

Lumber grades: No through holes or loose knots.

Installation: Install over 1/2" gypsum wallboard (see soffit construction diagram on page 4).

Nails and Nailing: See Siding.

HORIZONTAL SIDING

<i>Species/Products</i>	<i>Size, Installation</i>
WESTERN RED CEDAR, PORT ORFORD CEDAR, INCENSE CEDAR, ALASKA YELLOW CEDAR, REDWOOD, PONDEROSA PINE, DOUGLAS FIR, WHITE FIR, WESTERN SPRUCE, other species having an ASTM E84 flame-spread rating not greater than 150 (<i>reference: Calif. OSFM WUI Products Handbook³</i>)	
Tongued & Grooved, Shiplap, V Shiplap, Channel Shiplap, Log Cabin ¹	1x6 min. (1-1/2" thick for log cabin), installed horizontally over 7/16" min. OSB or plywood
WESTERN RED CEDAR, PORT ORFORD CEDAR, INCENSE CEDAR, ALASKA YELLOW CEDAR, REDWOOD, other species having an ASTM E84 flame-spread rating not greater than 75 (<i>reference: Calif. OSFM WUI Products Handbook³ or noted otherwise</i>)	
Tongued & Grooved, Shiplap, V Shiplap ¹	1x4, installed horizontally over 7/16" min. OSB or plywood, an additional face nail shall be placed approximately 1" from the grooved edge (<i>reference: Western Fire Center⁴ test, 2009</i>)
Rabbeted Bevel ¹	1x6 min., installed horizontally over 7/16" min. OSB or plywood

VERTICAL SIDING

WESTERN RED CEDAR, PORT ORFORD CEDAR, INCENSE CEDAR, ALASKA YELLOW CEDAR, REDWOOD, PONDEROSA PINE, DOUGLAS FIR, WHITE FIR, WESTERN SPRUCE, other species having an ASTM E84 flame-spread rating not greater than 100 (<i>reference: Calif. OSFM WUI Products Handbook³</i>)	
Tongued & Grooved, Shiplap, V Shiplap, Channel Shiplap ¹	1x6 min., installed vertically over 7/16" min. OSB or plywood, fastener spacing 24" o.c. max. in vertical direction
WESTERN RED CEDAR, PORT ORFORD CEDAR, INCENSE CEDAR, ALASKA YELLOW CEDAR, REDWOOD, other species having an ASTM E84 flame-spread rating not greater than 75 (<i>reference: Calif. OSFM WUI Products Handbook³</i>)	
Tongued & Grooved, Shiplap, V Shiplap ¹	1x4, installed vertically over 7/16" min. OSB or plywood, an additional face nail shall be placed approximately 1" from the grooved edge
Board-and-Batten ¹ boards	1x8 min. board and 5/4x4 minimum battens, installed vertically over 7/16" min. OSB or plywood, installed with a 1/2" max. gap, battens fastened to wood framing with 3" min. long fasteners, fastener spacing 24" o.c. max. in vertical direction
Board-on-Board ¹	1x8 min. boards, installed vertically over 7/16" OSB or plywood, 3/4"x3-1/2" min. plywood inserts installed with a 1/8" max. gap between them and the underlying course of boards. Top course of boards fastened to wood framing with 3" min. long fasteners, and underlying course of boards and plywood inserts fastened to wood framing with 2-1/4" min. long fasteners, fastener spacing 24" o.c. max. in vertical direction

DECKING

<i>Species/Products</i>	<i>Size, Installation</i>	<i>Reference</i>
PONDEROSA PINE		
5/4 decking	5/4x6 ² , over solid wood joist spacing 24" o.c. max. Note: connecting walls use noncombustible or FRT wood exterior wall covering	Western Fire Center ⁴ test, 2008
WESTERN RED CEDAR, PORT ORFORD CEDAR, INCENSE CEDAR, ALASKA YELLOW CEDAR, REDWOOD		
Solid wood decking	nominal 2" min. thickness, over solid wood joist spacing 24" o.c. max.	Calif. OFSM WUI Product Handbook ³

SOFFITS

<i>Species/Products</i>	<i>Size, Installation</i>	<i>Reference</i>
PONDEROSA PINE		
Tongued & Grooved, Shiplap ¹	1x6 ² , over 1/2" gypsum wallboard, see Siding for nailing schedule	Western Fire Center ⁴ test, 2008

¹ Publications G-16, Standard Patterns, and TG-8, Natural Wood Siding Technical Guide, *Western Wood Products Association*; Standard Patterns, *West Coast Lumber Inspection Bureau*; Standard Dry Patterns, *Western Red Cedar Lumber Association*; and Redwood Lumber Patterns No. 17, *California Redwood Association*. Edge- and end-glued siding is permitted to be used interchangeably with solid-sawn members. Preservative-treating (such as CCA, ACQ or AZCQ that does not increase the flame spread rating of the wood products) and/or topical coating and finishing (such as primer, paint and/or stain application) to natural solid-sawn wood decking that had successfully passed the CA SFM 12-7A-4 test does not void the testing results nor alter the product acceptance listing, provided the thickness of the coating is less than 0.036 inch and is applied directly to the wood surface.

² Products successfully fire-tested are applicable to the width tested and wider.

³ *Wildland-Urban Interface Products Handbook* published by California Office of the State Fire Marshal: <http://www.osfm.fire.ca.gov/strucfireengineer/pdf/bml/wuiproducs.pdf>.

⁴ Western Fire Center is an approved testing agency of the California Office of the State Fire Marshal.

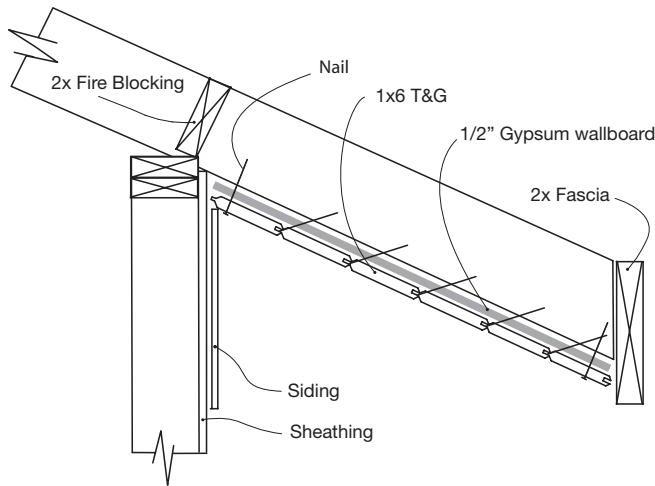
SOLID WOOD SIDING PATTERNS AND NAILING SCHEDULES FOR COMPLIANCE TO CBC CHAPTER 7A

Siding Pattern	Nailing		Siding Pattern	Nailing	
	6"	8" and Wider		6"	8" and Wider
DROP: TONGUED & GROOVED and SHIPLAP		 <p>← approximate 1/8" gap for dry material 8" and wider</p> <p>1/2" = full depth of rabbet</p>	TONGUED & GROOVED¹	 	
SHIPLAP¹		 <p>← approximate 1/8" gap for dry material 8" and wider</p> <p>1/2" = full depth of rabbet</p>	CHANNEL SHIPLAP (RUSTIC)²	 <p>← approximate 1/8" gap for dry material 8" and wider</p> <p>1/2" = full depth of rabbet</p>	
RABBETED BEVEL		 <p>← approximate 1/8" gap for dry material 8" and wider</p> <p>1/2" = full depth of rabbet</p>	LOG CABIN	 <p>← approximate 1/8" gap for dry material 8" and wider</p> <p>1/2" = full depth</p>	
BOARD-AND-BATTEN		 <p>1/2"</p>	BOARD-ON-BOARD	 <p>(one nail per bearing)</p> <p>1/8" max. gap</p> <p>plywood insert</p>	

1 4" siding uses nailing schedule for 6" siding with an additional nail approximately 1" from the grooved or shiplap edge.

2 V Shiplap uses nailing schedule for Channel Shiplap.

DIAGRAM OF SOFFIT CONSTRUCTION



FIRE TESTS

Test requirements for acceptance of products used in exterior applications are detailed by the OSFM in the WUI Building Standards. The standards are detailed outlining the equipment needed for testing, the test preparation protocols, the test procedures and conditions for acceptance. To review the testing standards, go to the following web sites:

Exterior Wall Siding and Sheathing - Testing Standard CA SFM 12.7A-1

http://www.fire.ca.gov/fire_prevention/downloads/Part_12_CA_SFM_12-7A-1_Test_Standards.pdf

Under Eave - Testing Standard CA SFM 12.7A-3

http://www.fire.ca.gov/fire_prevention/downloads/Part_12_CA_SFM_12-7A-3_Test_Standards.pdf

Decking - Testing Standard CA SFM 12.7A-4

http://www.fire.ca.gov/fire_prevention/downloads/Part_12_CA_SFM_12-7A-4_Test_Standards.pdf

OTHER WOOD PRODUCTS

The use of solid wood fascia and trim products and exterior wood deck structural framing assemblies are not regulated under the requirements in CBC Chapter 7A.

Untreated solid-sawn lumber, preservative-treated lumber and other products such as heavy timbers or logs may be used without undergoing WUI fire testing. See the table below to determine which solid wood products may require successful WUI fire testing for use in California.

In 2009, OSFM has begun to issue CBC Ch 7A Compliance Policies to provide clarification of the existing regulation. See #09-01 for Eave Vents and Attic Ventilation at <http://osfm.fire.ca.gov>.

USE OF OTHER WOOD PRODUCTS

Product	Exterior FRT ¹ Wood	Heavy Timber	Log Wall	Solid Sawn Lumber and Preservative-Treated Wood
Decking	OK without WUI Testing	OK without WUI Testing	Not applicable	Must meet the following requirements: (1) pass the WUI Decking Under-Flame test, and (2) pass ASTM D2898 and D3201 Accelerated Weathering tests, and (3) a. use noncombustible or FRT ¹ exterior wall covering, or b. ensure the decking has Class B flame-spread rating ²
Siding	OK without WUI Testing	OK without WUI Testing	OK without WUI Testing	WUI Testing required
Soffit	OK without WUI Testing	OK without WUI Testing	OK without WUI Testing	WUI Testing required
Fascia & Trim	OK without WUI Testing	Not applicable	Not applicable	OK without WUI Testing

¹ FRT - Fire Retardant Treated wood

² Western Wood species with a flame-spread rating of Class B (26-75) are listed below:

Western Larch - 45

Engelmann Spruce - 55

Port Orford Cedar - 60

Redwood - 65

Pacific Silver Fir - 69

West Coast Hemlock - 73

Alaska Yellow Cedar - 50

Hem-Fir - 60

Incense Cedar - 65

White Fir - 65

Western Red Cedar - 69

Sitka Spruce - 74

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