

**SECTION 503  
IGNITION-RESISTANT  
CONSTRUCTION AND MATERIAL**

**503.1 General.** Buildings and structures hereafter constructed, modified or relocated into or within *wildland-urban interface areas* shall meet the construction requirements in accordance with Table 503.1. Class 1, Class 2 or Class 3, ignition-resistant construction shall be in accordance with Sections 504, 505 and 506, respectively. Materials required to be ignition-resistant materials shall comply with the requirements of Section 503.2.

**503.2 Ignition-resistant building material.** Ignition-resistant building materials shall comply with any one of the following:

1. Material shall be tested on all sides with the extended ASTM E84 (UL 723) test or ASTM E2768, except panel products shall be permitted to test only the front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E84 or UL 723 for a test period of 30 minutes, or with ASTM E2768, comply with the following:
  - 1.1. Flame spread. Material shall exhibit a *flame spread index* not exceeding 25 and shall not show evidence of progressive combustion following the extended 30-minute test.
  - 1.2. Flame front. Material shall exhibit a flame front that does not progress more than 10 1/2 feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.
  - 1.3. Weathering. Ignition-resistant building materials shall maintain their performance

in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:

- 1.3.1. Method A “Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing” in ASTM D2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.
- 1.3.2. ASTM D7032 for wood-plastic composite materials.
- 1.3.3. ASTM D6662 for plastic lumber materials.

1.4 Identification. Materials shall bear identification showing the fire test results.

**Exception:** Materials composed of a combustible core and a noncombustible exterior covering made from either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum 0.0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.

2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.

**TABLE 503.1  
IGNITION-RESISTANT CONSTRUCTION<sup>a</sup>**

DEFENSIBLE SPACE <sup>c</sup>	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply <sup>b</sup>		Water Supply <sup>b</sup>		Water Supply <sup>b</sup>	
	Conforming <sup>d</sup>	Nonconforming <sup>e</sup>	Conforming <sup>d</sup>	Nonconforming <sup>e</sup>	Conforming <sup>d</sup>	Nonconforming <sup>e</sup>
Nonconforming	IR 2	IR 1	IR 1	IR 1 N.C.	IR 1 N.C.	Not Permitted
Conforming	IR 3	IR 2	IR 2	IR 1	IR 1	IR 1 N.C.
1.5 × Conforming	Not Required	IR 3	IR 3	IR 2	IR 2	IR 1

- a. Access shall be in accordance with Section 403.
- b. Subdivisions shall have a conforming water supply in accordance with Section 402.1.
  - IR 1 = Ignition-resistant construction in accordance with Section 504.
  - IR 2 = Ignition-resistant construction in accordance with Section 505.
  - IR 3 = Ignition-resistant construction in accordance with Section 506.
  - N.C. = Exterior walls shall have a fire-resistance rating of not less than 1 hour and the exterior surfaces of such walls shall be noncombustible. Usage of log wall construction is allowed.
- c. Conformance based on Section 603.
- d. Conformance based on Section 404.
- e. A nonconforming water supply is any water system or source that does not comply with Section 404, including situations where there is no water supply for structure protection or fire suppression.



4. Fire-retardant-treated wood *roof coverings*. *Roof assemblies* containing fire-retardant-treated wood shingles and shakes that comply with the requirements of Section 1505.6 of the *International Building Code* and classified as Class A *roof assemblies* as required in Section 1505.2 of the *International Building Code*.

## SECTION 504

### CLASS 1 IGNITION-RESISTANT CONSTRUCTION

**504.1 General.** Class 1 ignition-resistant construction shall be in accordance with Sections 504.2 through 504.11.

- 504.2 Roof assembly.** Roofs shall have a *roof assembly* that complies with a Class A rating when tested in accordance with ASTM E108 or UL 790. For *roof assemblies* where the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of 72-pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 installed over the combustible *roof deck*.

#### Exceptions:

1. Class A *roof assemblies* include those with coverings of brick, masonry or an exposed concrete *roof deck*.
2. Class A *roof assemblies* also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a *roof deck* on noncombustible framing.
3. Class A *roof assemblies* include minimum 16 oz/sq. ft. (0.0416 kg/m<sup>2</sup>) copper sheets installed over combustible *roof decks*.

**504.2.1 Roof valleys.** Where provided, valley flashings shall be not less than 0.019 inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide (914 mm) underlayment consisting of one layer of 72-pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 running the full length of the valley.

**504.3 Protection of eaves.** Eaves and soffits shall be protected on the exposed underside by ignition-resistant materials or by materials *approved* for not less than 1-hour *fire-resistance-rated construction*, 2-inch (51 mm) nominal dimension lumber, or 1-inch (25 mm) nominal fire-retardant-treated lumber or <sup>3</sup>/<sub>4</sub>-inch (19.1 mm) nominal fire-retardant-treated plywood, identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*. Fascias are required and shall be protected on the backside by ignition-resistant materials or by materials *approved* for not less than 1-hour *fire-resistance-rated construction* or 2-inch (51 mm) nominal dimension lumber.

**504.4 Gutters and downspouts.** Gutters and downspouts shall be constructed of *noncombustible* material. Gutters shall be provided with an *approved* means to prevent the accumulation of leaves and debris in the gutter.

**504.5 Exterior walls.** Exterior walls of buildings or structures shall be constructed with one of the following methods:

1. Materials *approved* for not less than 1-hour *fire-resistance-rated construction* on the exterior side.
2. *Approved noncombustible* materials.
3. Heavy timber or *log wall construction*.
4. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.
5. Ignition-resistant materials complying with Section 503.2 on the exterior side.

Such material shall extend from the top of the foundation to the underside of the roof sheathing.

**504.6 Underfloor enclosure.** Buildings or structures shall have underfloor areas enclosed to the ground with exterior walls in accordance with Section 504.5.

**Exception:** Complete enclosure shall not be required where the underside of exposed floors and exposed structural columns, beams and supporting walls are protected as required for exterior 1-hour *fire-resistance-rated construction* or *heavy timber construction* or fire-retardant-treated wood. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.

**504.7 Appendages and projections.** *Unenclosed accessory structures* attached to buildings with habitable spaces and projections, such as decks, shall be not less than 1-hour fire-resistance-rated construction, *heavy timber construction* or constructed of one of the following:

1. *Approved noncombustible* materials.
2. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.
3. Ignition-resistant building materials in accordance with Section 503.2.

**Exception:** Coated materials shall not be used as the walking surface of decks.

**504.7.1 Underfloor areas.** Where the attached structure is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have underfloor areas enclosed to within 6 inches (152 mm) of the ground, with exterior wall construction in accordance with Section 504.5.

**504.8 Exterior glazing.** Exterior windows, window walls and glazed doors, windows within exterior doors, and skylights shall be tempered glass, *multilayered glazed panels*, glass block or have a fire protection rating of not less than 20 minutes.



**504.9 Exterior doors.** Exterior doors shall be *approved* noncombustible construction, solid core wood not less than 1<sup>3</sup>/<sub>4</sub> inches thick (44 mm), or have a fire protection rating of not less than 20 minutes. Windows within doors and glazed doors shall be in accordance with Section 504.8.

**Exception:** Vehicle access doors.

**504.10 Vents.** Attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m<sup>2</sup>) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed 1/4 inch (6.4 mm), or shall be designed and *approved* to prevent flame or ember penetration into the structure.

**504.10.1 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

**504.11 Detached accessory structures.** Detached accessory structures located less than 50 feet (15 240 mm) from a building containing habitable space shall have exterior walls constructed with materials *approved* for not less than 1-hour *fire-resistance-rated construction*, heavy timber, *log wall construction*, or constructed with *approved noncombustible* materials or fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.

**504.11.1 Underfloor areas.** Where the detached structure is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have underfloor areas enclosed to within 6 inches (152 mm) of the ground, with exterior wall construction in accordance with Section 504.5 or underfloor protection in accordance with Section 504.6.

**Exception:** The enclosure shall not be required where the underside of exposed floors and exposed structural columns, beams and supporting walls are protected as required for exterior 1-hour *fire-resistance-rated construction* or *heavy timber construction* or fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.

## SECTION 505

### CLASS 2 IGNITION-RESISTANT CONSTRUCTION

**505.1 General.** Class 2 ignition-resistant construction shall be in accordance with Sections 505.2 through 505.11.

**505.2 Roof assembly.** Roofs shall have a *roof assembly* that complies with not less than a Class A rating when tested in accordance with ASTM E108 or UL 790, or an *approved noncombustible roof covering*. For *roof assemblies* where

the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of cap sheet complying with ASTM D3909 installed over the combustible *roof deck*.

**505.2.1 Roof valleys.** Where provided, valley flashings shall be not less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide (914 mm) underlayment consisting of one layer of 72-pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 running the full length of the valley.

**505.3 Protection of eaves.** Combustible eaves, fascias and soffits shall be enclosed with solid materials with a minimum thickness of 3/4 inch (19 mm). Exposed rafter tails shall not be permitted unless constructed of heavy timber materials.

**505.4 Gutters and downspouts.** Gutters and downspouts shall be constructed of *noncombustible* material. Gutters shall be provided with an *approved* means to prevent the accumulation of leaves and debris in the gutter.

**505.5 Exterior walls.** Exterior walls of buildings or structures shall be constructed with one of the following methods:

1. Materials *approved* for not less than 1-hour *fire-resistance-rated construction* on the exterior side.
2. *Approved noncombustible* materials.
3. Heavy timber or *log wall construction*.
4. Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.
5. Ignition-resistant materials on the exterior side.

Such material shall extend from the top of the foundation to the underside of the roof sheathing.

**505.6 Underfloor enclosure.** Buildings or structures shall have underfloor areas enclosed to the ground, with exterior walls in accordance with Section 505.5.

**Exception:** Complete enclosure shall not be required where the underside of exposed floors and exposed structural columns, beams and supporting walls are protected as required for exterior 1-hour *fire-resistance-rated construction* or *heavy timber construction* or fire-retardant-treated wood. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.

**505.7 Appendages and projections.** *Unenclosed accessory structures* attached to buildings with habitable spaces and projections, such as decks, shall be not less than 1-hour *fire-resistance-rated construction*, *heavy timber construction* or constructed of one of the following:

1. *Approved noncombustible* materials.
2. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.



3. Ignition-resistant building materials in accordance with Section 503.2.

Exception: Coated materials shall not be used as the walking surface of decks.

**505.7.1 Underfloor areas.** Where the attached structure is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have underfloor areas enclosed to within 6 inches (152 mm) of the ground, with exterior wall construction in accordance with Section 505.5.

**505.8 Exterior glazing.** Exterior windows, window walls and glazed doors, windows within exterior doors, and skylights shall be tempered glass, *multilayered glazed panels*, glass block or have a fire protection rating of not less than 20 minutes.

**505.9 Exterior doors.** Exterior doors shall be *approved non-combustible* construction, solid core wood not less than 1<sup>3</sup>/<sub>4</sub> inches thick (45 mm), or have a fire protection rating of not less than 20 minutes. Windows within doors and glazed doors shall be in accordance with Section 505.8.

Exception: Vehicle access doors.

**505.10 Vents.** Attic ventilation openings, foundation or underfloor vents or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m<sup>2</sup>) each. Such vents shall be covered with *noncombustible* corrosion-resistant mesh with openings not to exceed 1/4 inch (6.4 mm) or shall be designed and *approved* to prevent flame or ember penetration into the structure.

**505.10.1 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located not less than 10 feet (3048 mm) from lot lines. Underfloor ventilation openings shall be located as close to grade as practical.

**505.11 Detached accessory structures.** Detached accessory structures located less than 50 feet (15 240 mm) from a building containing habitable space shall have exterior walls constructed with materials *approved* for not less than 1-hour *fire-resistance-rated construction*, heavy timber, *log wall construction*, or constructed with *approved noncombustible* materials or fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.

**505.11.1 Underfloor areas.** Where the detached *accessory structure* is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have underfloor areas enclosed to within 6 inches (152 mm) of the ground, with exterior wall construction in accordance with Section 505.5 or underfloor protection in accordance with Section 505.6.

Exception: The enclosure shall not be required where the underside of exposed floors and exposed structural

columns, beams and supporting walls are protected as required for exterior 1-hour *fire-resistance-rated construction* or heavy-timber construction or fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.

## SECTION 506

### CLASS 3 IGNITION-RESISTANT CONSTRUCTION

**506.1 General.** Class 3 ignition-resistant construction shall be in accordance with Sections 506.2 through 506.4.

**506.2 Roof assembly.** Roofs shall have a *roof assembly* that complies with not less than a Class B rating when tested in accordance with ASTM E108 or UL 790 or an *approved noncombustible roof covering*. For *roof assemblies* where the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall be firestopped to preclude entry of flames or embers, or have one layer of cap sheet complying with ASTM D3909 installed over the *combustible roof deck*.

**506.2.1 Roof valleys.** Where provided, valley flashings shall be not less than 0.019-inch (0.44 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide (914 mm) underlayment consisting of one layer of 72-pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 running the full length of the valley.

**506.3 Underfloor enclosure.** Buildings or structures shall have underfloor areas enclosed to the ground with exterior walls.

Exception: Complete enclosure shall not be required where the underside of exposed floors and exposed structural columns, beams and supporting walls are protected as required for exterior 1-hour *fire-resistance-rated construction*, fire-retardant-treated wood, or *heavy timber construction*. Fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section 2303.2 of the *International Building Code*.

**506.4 Gutters and downspouts.** Gutters and downspouts shall be constructed of *noncombustible* material. Gutters shall be provided with an *approved* means to prevent the accumulation of leaves and debris in the gutter.

## SECTION 507

### REPLACEMENT OR REPAIR OF ROOF COVERINGS

**507.1 General.** The *roof covering* on buildings or structures in existence prior to the adoption of this code that are replaced or have 25 percent or more replaced in a 12-month period shall be replaced with a *roof covering* required for new construction based on the type of ignition-resistant construction specified in accordance with Section 503.