

CHAPTER 4

WILDLAND-URBAN INTERFACE AREA REQUIREMENTS

User note:

About this chapter: Chapter 4 provides requirements that apply to all occupancies in the wildland-urban interface and pertain to all of the following:

1. Fire service access to the property that is to be protected, including fire apparatus access roads and off-road driveways.
2. Premises identification.
3. Key boxes to provide ready access to properties secured by gated roadways or other impediments to rapid fire service access.
4. Fire protection water supplies, including adequate water sources, pumper apparatus drafting sites, fire hydrant systems and system reliability.
5. Fire department access to equipment such as fire suppression equipment and fire hydrants.
6. Fire protection plans.

SECTION 401 GENERAL

401.1 Scope. *Wildland-urban interface areas* shall be provided with emergency vehicle access and water supply in accordance with this chapter.

401.2 Objective. This section is not adopted.

401.3 General safety precautions. This section is not adopted.

SECTION 402 APPLICABILITY

402.1 Subdivisions. Subdivisions shall comply with locally adopted standards.

402.1.1 Access. This section is not adopted.

402.1.2 Water supply. This section is not adopted.

402.2 Individual structures. Individual structures shall comply with Sections 402.2.1 and 402.2.2.

402.2.1 Access. Individual *structures* hereafter constructed or relocated into or within *wildland-urban interface areas* shall be provided with driveways in accordance with Section 403.2 and locally adopted standards. Marking of fire protection equipment shall be provided in accordance with Section 403.5 and address markers shall be provided in accordance with Section 403.6.

402.2.2 Water supply. Individual *structures* hereafter constructed or relocated into or within *wildland-urban interface areas* shall be provided with a conforming water supply in accordance with locally adopted standards.

Exception not adopted.

402.3 Existing conditions. This section is not adopted.

SECTION 403 ACCESS

403.1 Restricted access. Where emergency vehicle access is restricted because of secured access roads or driveways or where immediate access is necessary for life-saving or fire-fighting purposes, the *code official* is authorized to require a key box to be installed in an *approved* location. The key box shall be of a type *approved* by the *code official* and shall contain keys to gain necessary access as required by the *code official*.

403.2 Driveways. Driveways shall be provided where any portion of an exterior wall of the first story of a building is located more than 150 feet (45 720 mm) from a fire apparatus access road.

403.2.1 Dimensions. This section is not adopted.

403.2.2 Length. This section is not adopted.

403.2.3 Service limitations. This section is not adopted.

403.2.4 Turnarounds and turnouts. *Driveways* in excess of 300 feet in length shall be provided with turnarounds. *Driveways* in excess of 500 feet in length and less than 20 feet in width shall be provided with turnouts and turnarounds. Turnarounds and turnouts shall be designed as required by locally adopted standards.

403.2.5 Turnouts. This section is not adopted.

403.2.6 Bridges. Vehicle load limits shall be posted at both entrances to bridges on driveways and private roads. Design loads for bridges shall be established by the *code official*.

403.3 Fire apparatus access road. Where required, fire apparatus access roads shall be provided and maintained as required by locally adopted street, road, and access standards.

403.4 Marking of roads. This section is not adopted.

403.4.1 Sign construction. This section is not adopted.

403.5 Marking of fire protection equipment. Fire protection equipment and fire hydrants shall be clearly identified in

a manner *approved* by the *code official* to prevent obstruction.

403.6 Address markers. Buildings shall have a permanently posted address, which shall be placed at each *driveway* entrance and be visible from both directions of travel along the road. In all cases, the address shall be posted at the beginning of construction and shall be maintained thereafter, and the address shall be visible and legible from the road on which the address is located.

403.6.1 Signs along one-way roads. Address signs along one-way roads shall be visible from both the intended direction of travel and the opposite direction.

403.6.2 Multiple addresses. Where multiple addresses are required at a single *driveway*, they shall be mounted on a single post, and additional signs shall be posted at locations where driveways divide.

403.6.3 Single-business sites. Where a roadway provides access solely to a single commercial or industrial business, the address sign shall be placed at the nearest road intersection providing access to that site.

403.7 Grade. The gradient for fire apparatus access roads and driveways shall not exceed the maximum *approved* by the *code official*.

**SECTION 404
WATER SUPPLY**

404.1 General. Water supply shall be provided and maintained as required by locally adopted standards.

404.2 Water sources. This section is not adopted.

404.3 Draft sites. This section is not adopted.

404.3.1 Access. This section is not adopted.

404.3.2 Pumper access points. This section is not adopted.

404.4 Hydrants. This section is not adopted.

404.5 Adequate water supply. This section is not adopted.

404.6 Fire department. This section is not adopted.

404.7 Obstructions. This section is not adopted.

404.8 Identification. This section is not adopted.

404.9 Testing and maintenance. This section is not adopted.

404.10 Reliability. This section is not adopted.

404.10.1 Objective. This section is not adopted.

404.10.2 Clearance of fuel. This section is not adopted.

404.10.3 Standby power. This section is not adopted.

**SECTION 405
FIRE PROTECTION PLAN**

405.1 General. Where required by the *code official*, a *fire protection plan* shall be prepared.

405.2 Content. The plan shall be based on a site-specific wildfire risk assessment that includes considerations of location, topography, aspect, flammable vegetation, climatic conditions and fire history. The plan shall address water supply, access, building ignition and fire-resistance factors, fire protection systems and equipment, *defensible space* and vegetation management.

405.3 Cost. The cost of *fire protection plan* preparation and review shall be the responsibility of the applicant.

405.4 Plan retention. The *fire protection plan* shall be retained by the *code official*.

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CHAPTER 5

SPECIAL BUILDING CONSTRUCTION REGULATIONS

User note:

About this chapter: Chapter 5 provides regulations that establish minimum standards for the location, design and construction of buildings and structures based on fire hazard severity in the wildland-urban interface.

The construction provisions of Chapter 5 are intended to supplement the requirements of the International Building Code and address mitigation of the unique hazards posed to buildings by wildfire and to reduce the hazards of building fires spreading to wildland fuels. This is accomplished by requiring ignition-resistant construction materials based on the hazard severity of the building site. Construction features regulated include underfloor areas; roof coverings; eaves and soffits; gutters and downspouts; exterior walls, doors and windows; ventilation openings and accessory structures.

SECTION 501 GENERAL

501.1 General. Buildings and structures hereafter constructed, modified or relocated into or within the wildland-urban interface area shall meet the construction requirements of Sections 501.4 through 501.8.

Exceptions:

1. Buildings and structures with fire hazard severity determined in Section 502 and with ignition-resistant construction classification determined in Section 503.
2. Accessory structures not exceeding 200 square feet (18.5 m²) in floor area and where located not less than 50 feet (15 240 mm) from buildings or structures containing habitable spaces.
3. Agricultural buildings located not less than 50 feet (15 240 mm) from buildings or structures containing habitable spaces.

501.2 Objective. This section is not adopted.

501.3 Fire-resistance-rated construction. Where this code requires 1-hour fire-resistance-rated construction, the fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E119 or UL 263.

Exceptions:

1. The fire-resistance rating of building elements, components or assemblies based on the prescriptive designs prescribed in Section 721 of the *International Building Code*.
2. The fire-resistance rating of building elements, components or assemblies based on the calculation procedures in accordance with Section 722 of the *International Building Code*.

501.4 Roof covering. 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 fire-stopped 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, including 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/m²) copper sheets installed over combustible roof decks.

501.4.1 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.

501.5 Exterior walls and projections other than decks. Exterior walls and projections other than decks, of buildings, or structures, or accessory structures attached to buildings or structures with habitable spaces, shall be constructed with one of the following methods, with materials extending from the top of the foundation to the underside of the roof sheathing:

1. Materials approved for not less than one 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*; or

5. *Ignition-resistant materials*, complying with Section 503.2 on the exterior side.

Exception: Unenclosed *accessory structures* attached to *buildings* with habitable spaces and projections, such as decks, attached to the first floor of a *building*, if when the *structure* is built with building materials at least two inches nominal depth and the area below the unenclosed *accessory structure* is screened with material with openings no greater than 1/4 inch maximum to prevent accumulation of combustibles and to prevent embers from coming in underneath.

501.6 Decks and appendages. The material of decks, porches, balconies and stairs shall be constructed with any of the following materials:

1. *Ignition-resistant material* that complies with the minimum performance requirement of Section 503.2.
2. Exterior fire-retardant-treated wood.
3. *Noncombustible* material.
4. Any material that complies with the minimum performance requirements of Section 503.2 when attached exterior wall covering is also either *noncombustible* or *ignition-resistant material*.
5. Heavy timber construction consisting of the following:
 - 5.1. Posts shall be a minimum of 6 inches × 6 inches nominal dimension.
 - 5.2. Beams shall be a minimum of 6 inches × 8 inches nominal dimension.
 - 5.3. Joists shall be a minimum of 4 inches × 8 inches nominal dimension spaced at no greater than 24 inches on center.

501.6.1 Clearance. Decks with less than 48 inches of clearance from finished grade to deck joists shall be enclosed with screen material with openings no greater than 1/4 inch maximum to prevent accumulation of combustibles and to prevent embers from coming in underneath.

501.6.2 Walking surfaces. The walking surface material of decks, porches, balconies, and stairs shall be constructed with one of the following materials:

1. *Ignition-resistant material* that complies with the performance requirements of Section 503.2.
2. Exterior fire-retardant-treated wood.
3. *Noncombustible* material.
4. Where the deck, porch, balcony or stairs are constructed of heavy timber in accordance with Section 501.6, natural wood decking products shall be:
 - 4.1. 2-inch nominal dimension lumber; or
 - 4.2. 1 1/4-inch nominal hardwood (e.g., teak, mahogany, or other *approved* hardwood).

5. Material that complies with the performance requirements of Section 501.6.2.1 when tested in accordance with ASTM E2632 and when attached exterior wall covering is also composed of only noncombustible or *ignition-resistant materials*.

Exception: Wall material shall be permitted to be of any material that otherwise complies with Section 501.5 when the decking surface material complies with the performance requirements of ASTM E84 with a Class B flame spread index.

501.6.2.1 Material in Section 501.6.2, Item 5. The walking surface material shall be tested in accordance with ASTM E2632 and shall comply with the following condition of acceptance. The ASTM E2632 test shall be conducted on a minimum of three test specimens and the peak heat release rate shall be less than or equal to 25 kW/ft² (269 kW/m²). If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All the additional tests shall meet the condition of acceptance.

501.7 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.

501.8 Vents. Attic ventilation openings, foundation or under-floor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches (0.0929 m²) 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.

1. 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 possible.

SECTION 502 FIRE HAZARD SEVERITY

502.1 General. The fire hazard severity of building sites for buildings hereafter constructed, modified or relocated into *wildland-urban interface areas* shall be established in accordance with Table 502.1. See also Chapter 8.

502.2 Fire hazard severity reduction. The fire hazard severity identified in Table 502.1 is allowed to be reduced by implementing a vegetation management plan in accordance with Chapter 7.

TABLE 502.1
FIRE HAZARD SEVERITY

FUEL MODEL ^b	CRITICAL FIRE WEATHER FREQUENCY								
	≤ 1 Day ^a			2 to 7 days ^a			≥ 8 days ^a		
	Slope (%)			Slope (%)			Slope (%)		
	≤ 40	41-60	≥ 61	≤ 40	41-60	≥ 61	≤ 40	41-60	≥ 61
Light fuel	M	M	M	M	M	M	M	M	H
Medium fuel	M	M	H	H	H	H	E	E	E
Heavy fuel	H	H	H	H	E	E	E	E	E

E = Extreme hazard;
H = High hazard;
M = Moderate hazard.

a. Days per annum.

b. Where required by the code official, fuel classification shall be based on the historical fuel type for the area.

**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*.
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*.

TABLE 503.1
IGNITION-RESISTANT CONSTRUCTION^a

DEFENSIBLE SPACE ^c	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply ^b		Water Supply ^b		Water Supply ^b	
	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e
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.

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/m²) 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 3/4-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.