

IWUIC



cdpACCESS

2024 GROUP A PROPOSED CHANGES TO THE I-CODES

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2024 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

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TENTATIVE ORDER OF DISCUSSION 2024 PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some F code change proposals may not be included on this list, as they are being heard by another committee.

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WUIC1-24

IWUIC: 301.2, 401.2, 401.3, 501.2, 501.3, 601.2

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Delete without substitution:

~~301.2 Objective. The objective of this chapter is to provide simple baseline criteria for determining *wildland-urban interface areas*.~~

~~401.2 Objective. The objective of this chapter is to establish the minimum requirements for emergency vehicle access and water supply for buildings and structures located in the *wildland-urban interface areas*.~~

Revise as follows:

~~401.3~~401.2 General safety precautions.

General safety precautions shall be in accordance with this chapter. See also Appendix A.

Delete without substitution:

501.2 Objective.

The objective of this chapter is to establish minimum standards to locate, design and construct buildings and structures or portions thereof for the protection of life and property, to resist damage from wildfires, and to mitigate building and structure fires from spreading to wildland fuels. The minimum standards set forth in this chapter vary with the critical *fire weather*, slope and fuel type to provide increased protection, above the requirements set forth in the *International Building Code*, from the various levels of hazards.

Revise as follows:

501.3

501.2 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.

Delete without substitution:

~~601.2 Objective. The objective of this chapter is to establish minimum requirements to mitigate the risk to life and property from wildland fire exposures, exposures from adjacent structures and to prevent structure fires spreading to wildland fuels.~~

Reason: The intent of this proposal is to move/incorporate the "Objectives" to the notes at the top of each chapter. The items there describe how the chapter should apply and do not really have any substantive requirements, thus are better in the note sections. This is a companion to the Scope rewrite, and these were identified as unrelated to the enforceable requirements of the code.

There are two sections that would need to be renumbered. Section 401.2 also has an issue in that it says "See appendix A" but Appendix A only applies if adopted by a jurisdiction, and thus is inappropriate to include in the text of the code given that the appendix isn't mandatory.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This simply moves language from the body of the code to the notes, and has no regulatory effect.

WUIC1-24

WUIC2-24

IWUIC: [A] 106.3, SECTION 202, SECTION 202 (New), 402.2.2, SECTION 503, 503.1, TABLE 503.1, SECTION 504, 504.1, 504.3, 504.5, SECTION 505, 505.1, 505.5, SECTION 506, 506.1, 507.1, 602.1, G101.3.5

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

[A] 106.3 Site plan.

In addition to the requirements for plans in the *International Building Code*, site plans shall include topography, width and percent of grade of access roads, landscape and vegetation details, locations of structures or building envelopes, existing or proposed overhead utilities, occupancy classification of buildings, ~~types of ignition-resistant construction~~ WUI construction class of buildings, structures and their appendages, roof classification of buildings and site water supply systems. The *code 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.

~~IGNITION-RESISTANT CONSTRUCTION, CLASS 1. A schedule of additional requirements for construction in *wildland-urban interface areas* based on extreme fire hazard.~~

~~IGNITION-RESISTANT CONSTRUCTION, CLASS 2. A schedule of additional requirements for construction in *wildland-urban interface areas* based on high fire hazard.~~

~~IGNITION-RESISTANT CONSTRUCTION, CLASS 3. A schedule of additional requirements for construction in *wildland-urban interface areas* based on moderate fire hazard.~~

Add new definition as follows:

WUI CONSTRUCTION CLASS. One of three sets of additional requirements for construction in wildland-urban interface areas, classified as either Class 1 WUI construction, Class 2 WUI construction, or Class 3 WUI construction.

Revise as follows:

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 Section 404.

Exceptions:

- Structures constructed to meet the requirements for the ~~class of ignition-resistant construction~~ WUI construction class specified in Table 503.1 for a nonconforming water supply.
- Buildings containing only private garages, carports, sheds and agricultural buildings with a floor area of not more than 600 square feet (56 m²).

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 and~~ Class 3, ~~ignition-resistant construction~~ WUI construction classes shall be in accordance with Sections 504, 505 and 506, respectively. Materials required to be ~~ignition-resistant materials~~ ignition-resistant building materials shall comply with the requirements of Section 503.2.

TABLE 503.1 ~~IGNITION-RESISTANT~~ WUI CONSTRUCTION CLASSES^a

DEFENSIBLE SPACE ^c	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply ^d		Water Supply ^d		Water Supply ^d	
	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e	Conforming ^d	Nonconforming ^e
Nonconforming	IR Class 2	IR Class 1	IR Class 1	IR Class 1 N.C.	IR Class 1 N.C.	Not Permitted
Conforming	IR Class 3	IR Class 2	IR Class 2	IR Class 1	IR Class 1	IR Class 1 N.C.
1.5 × Conforming	Not Required	IR Class 3	IR Class 3	IR Class 2	IR Class 2	IR Class 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 Class 1 = Ignition-resistant~~ construction in accordance with Section 504.
 - ~~IR Class 2 = Ignition-resistant~~ construction in accordance with Section 505.
 - ~~IR Class 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~~ WUI CONSTRUCTION

504.1 General.

~~Class 1 ignition-resistant construction~~ Class 1 WUI construction shall be in accordance with Sections 504.2 through 504.11.

504.3 Protection of eaves.

Eaves and soffits shall be protected on the exposed underside by ~~ignition-resistant materials~~ ignition-resistant building 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~~ ignition-resistant building materials or by materials *approved* for not less than 1-hour *fire-resistance-rated construction* or 2-inch (51 mm) nominal dimension lumber.

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~~ ignition-resistant building 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.

SECTION 505

CLASS 2 IGNITION-RESISTANT WUI CONSTRUCTION

505.1 General.

~~Class 2 ignition-resistant construction~~ Class 2 WUI construction shall be in accordance with Sections 505.2 through 505.11.

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~~ Ignition-resistant building materials on the exterior side.

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

SECTION 506

CLASS 3 IGNITION-RESISTANT WUI CONSTRUCTION

506.1 General.

~~Class 3 ignition-resistant construction~~ Class 3 WUI construction shall be in accordance with Sections 506.2 through 506.4.

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~~ WUI construction class specified in accordance with Section 503.

602.1 General.

An *approved* automatic sprinkler system shall be installed in all occupancies in new buildings required to meet the requirements for ~~Class 1 ignition-resistant construction~~ Class 1 WUI construction in Chapter 5. The installation of the automatic sprinkler systems shall be in accordance with nationally recognized standards.

G101.3.5 Shelter in place.

Developments in the wildland-urban interface may be designed to allow occupants to "Shelter in place." Use of this design alternative should include ~~ignition-resistant construction~~ Class 1, Class 2 or Class 3 WUI construction class in accordance with Chapter 5, access, water supply, automatic sprinkler systems, provisions for and maintenance of *defensible space*, and a *Fire Protection Plan*. A *Fire Protection Plan* describes ways to minimize the fire problems created by a specific project or development. The purpose for the *Fire Protection Plan* is to reduce the burden and impact of the project or development on the community's fire protection delivery system. The plan may utilize components of land use, building construction, vegetation management and other design techniques and technologies. It should include specific mitigation measures consistent with the unique problems resulting from the location, topography, geology, flammable vegetation and climate of the proposed site. The plan shall be consistent with this code, and approved by the fire *code official*. The cost of preparation and review is to be borne by the project or development proponent.

Reason: This proposal cleans up terminology used in the IWUIC regarding materials and construction classes. Current language in the IWUIC does not use consistent terminology throughout and some of the terms currently used are not defined. The undefined term "ignition-resistant construction" implies that such construction must be composed of *ignition-resistant building materials*, which is not

necessarily the case. To address this, the undefined term "ignition-resistant construction" is replaced by the new term *WUI construction class*, for which a definition is proposed. Also, instances of the undefined term "ignition-resistant material" are consistently replaced with the defined term *ignition-resistant building material*. The intent of this proposal is to eliminate these specific instances of confusing language, improve consistency of terminology and ensure that terminology regarding materials and *WUI construction classes* is defined, where appropriate.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal replaces undefined terms with defined terms, to improve consistency and clarity without changing code requirements.

WUIC2-24

WUIC3-24

IWUIC: 403.4

Proponents: Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

2024 International Wildland Urban Interface Code

Revise as follows:

403.4 Marking of roads. *Approved signs or other approved notices shall be provided and maintained for access roads and driveways to identify such roads and prohibit the obstruction thereof to identify access roads. Approved signs shall be provided to prohibit the obstruction of access roads and driveways serving more than one building or structure. Required signs and notices shall be maintained and legible.*

Reason: This proposal is intended to clarify this section, and indicate that it is not required to provide signs at driveways.

This current section contains several requirements in one sentence:

1. Signs identifying access roads and driveways
2. Signs to prohibit obstruction of access roads and driveways
3. Maintenance of signs.

This proposal splits the components apart and modifies it so that:

1. Signs are required to identify access roads. Signs identifying driveways are not required.
2. Signs are required to prohibit obstruction of access roads. Such signs are not required for driveways unless they serve more than one building or structure.
3. The required signs and notices must be legible and maintained.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

This proposal will reduce the cost by eliminating the requirements for signs on driveways, and "NO OBSTRUCTION" signs on driveways serving individual structures. The cost per project is estimated to be \$100.

Estimated Immediate Cost Impact Justification (methodology and variables):

The cost is based on the purchase of an average of two 4 x 4 redwood posts, paint and labor.

WUIC3-24

WUIC4-24

IWUIC: 404.5

Proponents: Pierson Stoecklein, Frontline Wildfire Defense

2024 International Wildland Urban Interface Code

Revise as follows:

404.5 Adequate water supply.

Adequate water supply shall be determined for purposes of initial attack, ember control and flame front control as follows:

1. One- and two-family dwellings. The required water supply for one- and two-family dwellings having a *fire flow calculation area* that does not exceed 3,600 square feet (334 m²) shall be 1,000 gallons per minute (63.1 L/s) for a minimum duration of 30 minutes. The required water supply for one- and two-family dwellings having a *fire flow calculation area* in excess of 3,600 square feet (334 m²) shall be 1,500 gallons per minute (95 L/s) for a minimum duration of 30 minutes.

Exception: A reduction in required flow rate of 50 percent, as *approved* by the *code official*, is allowed where the building is provided with an *approved* automatic sprinkler system, or an approved exterior wildfire sprinkler system, or both.

2. Buildings other than one- and two-family dwellings. The water supply required for buildings other than one- and two-family dwellings shall be as *approved* by the *code official* but shall be not less than 1,500 gallons per minute (95 L/s) for a duration of 2 hours.

Exception: A reduction in required flow rate of up to 75 percent, as *approved* by the *code official*, is allowed where the building is provided with an *approved* automatic sprinkler system, or an approved exterior wildfire sprinkler system, or both. The resulting water supply shall not be less than 1,500 gallons per minute (94.6 L/s).

Reason: This modification facilitates (but does not require) the potential installation of a exterior wildfire sprinkler system while ensuring that water supply is addressed. It would subject each exterior system to the same water supply and flow rate requirements applicable to interior sprinkler systems without making any changes to existing precedent.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction requirements, the proposed modifications have no cost impact.

WUIC4-24

WUIC5-24

IWUIC: 502.2

Proponents: Pierson Stoecklein, Frontline Wildfire Defense

2024 International Wildland Urban Interface Code

Revise as follows:

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 Appendix B or by installing an approved exterior wildfire sprinkler system.

Reason: This proposal would allow (but not require) a code official to reduce the fire hazard severity where an approved exterior wildfire sprinkler system is installed. This simply means that, where an exterior sprinkler system is capable of providing the same or greater benefits relative to a vegetation management plan, the sprinkler system would warrant the same consideration with regard to reducing the fire hazard severity.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction requirements, the proposed modifications have no cost impact.

WUIC5-24

WUIC6-24

IWUIC: 503.1

Proponents: Pierson Stoecklein, Frontline Wildfire Defense

2024 International Wildland Urban Interface Code

Revise as follows:

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.

Exception:Where a building or structure constructed in the nonconforming defensible space category is provided with an approved exterior wildfire sprinkler system, the defensible space shall be deemed conforming and construction shall be in accordance with the requirements applicable to the conforming defensible space category.

Reason: An exterior wildfire sprinkler system significantly increases the effectiveness of the defensible space and warrants this modification.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction requirements, the proposed modifications have no cost impact.

WUIC6-24

WUIC7-24

IWUIC: SECTION 602, 602.1, 602.2 (New), 602.3 (New), 602.3.1 (New), 602.3.2 (New), 602.4 (New), 602.4.1 (New), 602.4.2 (New), 602.4.3 (New), 602.4.4 (New), 602.4.5 (New), 602.4.6 (New)

Proponents: Pierson Stoecklein, Frontline Wildfire Defense

2024 International Wildland Urban Interface Code

Revise as follows:

SECTION 602 ~~AUTOMATIC~~FIRE SPRINKLER SYSTEMS

602.1 General.

An *approved* automatic sprinkler system shall be installed in all occupancies in new buildings required to meet the requirements for Class 1 ignition-resistant construction in Chapter 5. The installation of the automatic sprinkler systems shall be in accordance with nationally recognized standards. Where permitted by the fire code official, an exterior wildfire sprinkler system shall be installed permanently in accordance with Sections 602.2 through 602.4.

Add new text as follows:

602.2 Exterior wildfire sprinkler system coverage. Where approved by the code official, an exterior wildfire sprinkler system shall provide coverage of the entire defensible space required per Table 603.2, as well as any exterior horizontal or vertical surface that is less than 67.5 degrees in angle and is within the perimeter of the defensible space.

602.3 Water supply. Where connected to a public water supply, an exterior wildfire sprinkler system shall include a mechanism, in a conspicuously marked location, accessible to the fire service, which allows immediate manual termination of system operation. Where approved by the code official, alternative sources of water supply, including fire department connections, shall be permitted to supply water to an exterior wildfire sprinkler system. The code official shall be authorized to require an exterior wildfire sprinkler system to utilize a specified percentage of biodegradable, Class A firefighting foam in order to reduce the amount of water consumed by the system.

602.3.1 Duration. An approved exterior wildfire sprinkler system shall be equipped with a resettable shutoff device that activates automatically after 90 minutes of continuous operation and can be reset without manual intervention to resume the flow of water through the system.

602.3.2 Freeze protection. Any exterior wildfire sprinkler system in an area subject to freezing shall be a dry pipe system or winterized by alternative means where approved by the code official.

602.4 Exterior wildfire sprinkler system components. An exterior wildfire sprinkler system shall consist of approved equipment and devices.

602.4.1 Sprinkler-type devices. An exterior wildfire sprinkler system shall be equipped with approved open sprinkler-type devices at approved locations

602.4.2 Control valves. An exterior wildfire sprinkler system shall have a control valve equipped with an automatic system shutoff mechanism that is capable of being controlled remotely to activate, pause, and deactivate the system. Where permitted, additional control valves shall be identified by signage at the main control valve.

Exception: The code official is authorized to permit a manually controlled exterior wildfire sprinkler system only where constant supervision will be present.

602.4.3 Drain valves. An exterior wildfire sprinkler system shall have a separate drain valve installed on the system-side of each control valve, except where an open sprinkler-type device, top-fed system is arranged to facilitate drainage.

602.4.4 Pressure gauges. Each exterior wildfire sprinkler system shall be equipped with one or more digital pressure gauges and at least one analog pressure gauge, each of which shall be capable of monitoring static and dynamic system and water supply pressures.

602.4.5 Pipes and fittings. All exterior wildfire sprinkler system pipes and fittings installed on the exterior of the building or structure shall be non-photodegradable, corrosion resistant, permanently connected to a water supply, and designed to drain upon deactivation of the system.

602.4.6 Backflow device. Where any potable water source is connected to or used to supply the exterior wildfire sprinkler system, an approved backflow preventer shall be installed in the riser or feed main.

Reason: 90% of structure ignitions during a wildfire are caused by embers ([Wildland Fire Embers and Flames: Home Mitigations That Matter](#), at p6, IBHS). Embers can travel in excess of 24 miles outside of a wildfire perimeter—the distance being subject to wind and convective heat—as well as ember parent material (IBHS, NIST). Given the distance of ember travel and the quantity of structures simultaneously exposed to embers, it is often impossible for firefighters to actively defend all structures, all at once.

Both regulated and non-regulated fuels are often present within the defensible space perimeter. Although regulated fuels, such as plant fuels and building materials, are subject to regulation under the IWUIC and IBC, non-regulated fuels, such as patio furniture, door mats, accumulated pine needles and leaves, firewood, toys, and other household items and natural materials are not. Regardless, when fuels of either type are subjected to ember cast and subsequently reach combustion, heat transfer from these fuels contributes to structure combustion.

Exterior wildfire sprinkler systems provide added protection for structures and are uniquely effective when used in conjunction with fire-resistant construction materials and defensible space (see [Fire Sprinklers Technical Fact Sheet #15](#), *Federal Emergency Management Agency*) ([Protect Your Property from Wildfire](#), California Edition, IBHS). Automatic interior fire sprinkler systems activate from contact with direct heat (i.e., after a fire has already begun and reached the immediate vicinity of the system) and are designed primarily to prevent flashover inside the home while allowing the occupants to escape and the fire department to arrive. In contrast, exterior wildfire sprinkler systems are deployed with a focus on mitigation/prevention, the primary objective being to hydrate combustible materials that comprise or are within a certain distance of a structure, well before the structure is exposed to ignition sources (e.g., air borne embers); exterior wildfire sprinkler systems do not activate from contact with direct heat contact.

Building and maintaining a saturation level of optimal hydration is vital to prevention of ember ignition and, by hydrating the exterior surfaces of a structure and increasing the moisture content of regulated and non-regulated fuels located within the relevant defensible space, exterior wildfire sprinkler systems can prevent or significantly reduce ignition risk (see [Factsheet: FireSmart Exterior Home Sprinklers and Structure Protection Units](#), British Columbia FireSmart). This reduces the fire hazard severity of building sites for buildings constructed, modified or relocated into wildland-urban interface areas and can substantially increase the effectiveness of defensible space (whether conforming or nonconforming).

The proposed modifications incorporate exterior wildfire sprinklers into the IWUIC and thereby offer a new self-defense mechanism independent of active firefighter defense. Reducing the number of active defense actions that must be taken by firefighters results in a safer firefighting environment and enables more focused and therefore effective use of limited firefighting resources.

The addition of this new section identifies critical features and functionality of an ideal exterior wildfire sprinkler system.

Bibliography:

1. [Wildland Fire Embers and Flames: Home Mitigations That Matter](#), IBHS (April 2023).
2. [Fire Sprinklers, Home Builder's Guide to Construction in Wildfire Zones, Technical Fact Sheet #15](#), *Federal Emergency Management Agency*.
3. [Protect Your Property from Wildfire](#), California Edition, IBHS.
4. [Factsheet: FireSmart Exterior Home Sprinklers and Structure Protection Units](#), British Columbia FireSmart.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction requirements, the proposed modifications have no cost impact.

WUIC7-24

WUIC8-24

IWUIC: 603.2

Proponents: Pierson Stoecklein, Frontline Wildfire Defense (pierson@pioneerpublicaffairs.com)

2024 International Wildland Urban Interface Code

Revise as follows:

603.2 Fuel modification.

Buildings or structures, constructed in compliance with the conforming *defensible space* category of Table 503.1, shall comply with the *fuel modification* distances contained in Table 603.2. For all other purposes the *fuel modification* distance shall be not less than 30 feet (9144 mm) or to the lot line, whichever is less. Distances specified in Table 603.2 shall be measured on a horizontal plane from the perimeter or projection of the building or structure as shown in Figure 603.2. Distances specified in Table 603.2 are allowed to be increased by the *code official* because of a site-specific analysis based on local conditions and the *fire protection plan*.

Exception: Where a building or structure is equipped with an approved exterior wildfire sprinkler system and constructed in compliance with the conforming defensible space category of Table 503.1, the code official is permitted to decrease the distances specified in Table 603.2 when utilizing a site-specific analysis accounting for local conditions and the fire protection plan.

Reason: An exterior wildfire sprinkler system substantially increases the effectiveness of defensible space and allows the code official (but does not require) to reduce the minimum area distance/required.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction requirements, the proposed modifications have no cost impact.

WUIC8-24

WUIC9-24

IWUIC: SECTION 202 (New)

Proponents: Pierson Stoecklein, Frontline Wildfire Defense

2024 International Wildland Urban Interface Code

Add new definition as follows:

EXTERIOR WILDFIRE SPRINKLER SYSTEM

An approved system of piping, devices, and equipment which is automatically or manually activated to discharge water or an approved fire-extinguishing agent onto the exterior surfaces of a structure and the adjacent grade to hydrate the defensible space area required by Section 603.2.

Reason: There is no existing definition in the IWUIC for "exterior wildfire sprinkler system" although there is reference to such a system in the appendices. Including a definition in the code merely establishes a foundation for all related modifications submitted by this proponent and/or any future proposals related to exterior wildfire sprinkler systems without imposing any requirements.

90% of structure ignitions during a wildfire are caused by embers ([Wildland Fire Embers and Flames: Home Mitigations That Matter](#), at p6, IBHS). Embers can travel in excess of 24 miles outside of a wildfire perimeter—the distance being subject to wind and convective heat—as well as ember parent material (IBHS, NIST). Given the distance of ember travel and the quantity of structures simultaneously exposed to embers, it is often impossible for firefighters to actively defend all structures, all at once.

Both regulated and non-regulated fuels are often present within the defensible space perimeter. Although regulated fuels, such as plant fuels and building materials, are subject to regulation under the IWUIC and IBC, non-regulated fuels, such as patio furniture, door mats, accumulated pine needles and leaves, firewood, toys, and other household items and natural materials are not. Regardless, when fuels of either type are subjected to ember cast and subsequently reach combustion, heat transfer from these fuels contributes to structure combustion.

Exterior wildfire sprinkler systems provide added protection for structures and are uniquely effective when used in conjunction with fire-resistant construction materials and defensible space (see [Fire Sprinklers Technical Fact Sheet #15](#), *Federal Emergency Management Agency*) ([Protect Your Property from Wildfire](#), California Edition, IBHS). Automatic interior fire sprinkler systems activate from contact with direct heat (i.e., after a fire has already begun and reached the immediate vicinity of the system) and are designed primarily to prevent flashover inside the home while allowing the occupants to escape and the fire department to arrive. In contrast, exterior wildfire sprinkler systems are deployed with a focus on mitigation/prevention, the primary objective being to hydrate combustible materials that comprise or are within a certain distance of a structure, well before the structure is exposed to ignition sources (e.g., air borne embers); exterior wildfire sprinkler systems do not activate from contact with direct heat contact.

Building and maintaining a saturation level of optimal hydration is vital to prevention of ember ignition and, by hydrating the exterior surfaces of a structure and increasing the moisture content of regulated and non-regulated fuels located within the relevant defensible space, exterior wildfire sprinkler systems can prevent or significantly reduce ignition risk (see [Factsheet: FireSmart Exterior Home Sprinklers and Structure Protection Units](#), British Columbia FireSmart). This reduces the fire hazard severity of building sites for buildings constructed, modified or relocated into wildland-urban interface areas and can substantially increase the effectiveness of defensible space (whether conforming or nonconforming).

The proposed modifications incorporate exterior wildfire sprinklers into the IWUIC and thereby offer a new self-defense mechanism independent of active firefighter defense. Reducing the number of active defense actions that must be taken by firefighters results in a safer firefighting environment and enables more focused and therefore effective use of limited firefighting resources.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction requirements, the proposed modifications have no cost impact.

WUIC9-24

WUIC10-24

IWUIC: TABLE C101.1

Proponents: Pierson Stoecklein, Frontline Wildfire Defense (pierson@pioneerpublicaffairs.com)

2024 International Wildland Urban Interface Code

Revise as follows:

TABLE C101.1 FIRE HAZARD SEVERITY FORM

A. Subdivision Design Points	
1. Ingress/Egress	
Two or more primary roads	1__
One road	3__
One-way road in, one-way road out	5__
2. Width of Primary Road	
20 feet (6096 mm) or more	1__
Less than 20 feet (6096 mm)	3__
3. Accessibility	
Road grade 5% or less	1__
Road grade more than 5%	3__
4. Secondary Road Terminus	
Loop roads, cul-de-sacs with an outside turning radius of 45 feet (13 716 mm) or greater	1__
Cul-de-sac turnaround	2__
Dead-end roads 200 feet (60 960 mm) or less in length	3__
Dead-end roads greater than 200 feet (60 960 mm) in length	5__
5. Street Signs	
Present	1__
Not present	3__
B. Vegetation (IWUIC Definitions)	
1. Fuel Types	
Light	1__
Medium	5__
Heavy	10__
2. Defensible Space	
70% or more of site	1__
30% or more, but less than 70% of site	10__

Less than 30% of site	20__
C. Topography	
8% or less	1__
More than 8%, but less than 20%	4__
20% or more, but less than 30%	7__
30% or more	10__
D. Roofing Material	
Class A Fire Rated	1__
Class B Fire Rated	5__
Class C Fire Rated	10__
Nonrated	20__
E. Fire Protection—Water Source	
500 GPM (1892.5 L/min) hydrant within 1,000 feet (304.8 m) <u>or an approved exterior wildfire sprinkler system</u>	1__
Hydrant farther than 1,000 feet (304.8 m) or draft site	2__
Water source 20 min. or less, round trip	5__
Water source farther than 20 min., and 45 min. or less, round trip	7__
Water source farther than 45 min., round trip	10__
F. Existing Building Construction Materials	
Noncombustible siding/deck	1__
Noncombustible siding/combustible deck	5__
Combustible siding and deck	10__
G. Utilities (gas and/or electric)	
All underground utilities	1__
One underground, one above ground	3__
All above ground	5__
Total for Subdivision	
Moderate Hazard	40–59
High Hazard	60–74
Extreme Hazard	75+

Reason: Installation of an exterior wildfire sprinkler system provides similar impact to hazard severity as proximity to a water source.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction

requirements, the proposed modifications have no cost impact.

WUIC10-24

WUIC11-24

IWUIC: G101.3.1

Proponents: Pierson Stoecklein, Frontline Wildfire Defense

2024 International Wildland Urban Interface Code

Delete without substitution:

G101.3.1 Exterior sprinkler systems.

~~Currently, there is no nationally accepted standard for the design and installation of exterior fire sprinkler systems. Interior sprinkler systems are regulated by nationally recognized standards that have specific requirements. However, exterior sprinkler systems lack such uniformity. What is generally proposed is a type of sprinkler system, placed on the roofs or eaves of a building, whose primary purpose is to wet down the roof. These types of systems can be activated either manually or automatically. However, the contemporary thought on exterior sprinkler systems is that if the roof classification is of sufficient fire resistance, exterior sprinklers are of little or no value. Another option and alternative with exterior sprinklers is to use them to improve the relative humidity and fuel moisture in the *defensible space*. In this case, the exterior sprinkler is not used to protect the structure as much as it attempts to alter the fuel situation. However, studies do not support the idea that merely spraying water into the air in the immediate vicinity of a rapidly advancing wildland urban fire does much good. Clearly, irrigation systems that keep plants healthy and fire resistive plants that resist convection and radiated heat can accomplish the same purpose.~~

Reason: Outdated and inaccurate.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed modifications incorporate an exterior wildfire sprinkler system into the code as optional equipment that can be installed on a structure at the discretion of the owner/s and the local code official. Because installation is not mandated, nor do the proposed modifications alter any construction requirements, the proposed modifications have no cost impact.

WUIC11-24

WUIC12-24

IWUIC: SECTION 405, 405.1, 405.2, 405.3, 405.4, 602.3 (New), 602.3.1 (New), 602.3.2 (New)

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov); Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

2024 International Wildland Urban Interface Code

Revise as follows:

SECTION 405 602 FIRE PROTECTION PLANS

~~405.1 602.1 General. Where required by the code official, a fire protection plan shall be prepared.~~

The code official is authorized to require the owner or owner's authorized agent to provide a fire protection plan. The fire protection plan shall be prepared to determine the acceptability of fire protection and life safety measures designed to mitigate wildfire hazards presented for the property under consideration.

The fire protection plan shall be prepared by a registered design professional, qualified landscape architect, qualified fire safety specialist or similar specialist acceptable to the code official and shall analyze the wildfire risk of the building, project, premises or region to recommend necessary changes.

The code official is authorized to require a preliminary fire protection plan prior to the submission of a final fire protection plan.

~~405.2 602.2 Contents. 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.~~

The fire protection plan shall be based on a project-specific wildfire hazard assessment that includes considerations of location, topography, aspect, climatic and fire history.

The plan shall identify conformance with all applicable wildfire protection regulations.

The plan shall address fire department access, egress, road and address signage, water supply, and the applicable building codes and standards for wildfire safety. The plan shall identify mitigation measures to address the project's specific wildfire risk and shall include the information required in Sections 602.3 through 602.3.2.

Delete without substitution:

~~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.~~

Add new text as follows:

602.3 Project information. The final fire protection plan shall be reviewed and approved prior to start of construction.

602.3.1 Preliminary fire protection plan. When a preliminary fire protection plan is submitted, it shall include, at a minimum, the following:

1. Total size of the project.
2. Information on the adjoining properties on all sides, including current land uses, and if known, existing structures and densities, planned construction, natural vegetation, environmental restoration plans, roads and parks.

3. A map with all project boundary lines, property lines, slope contour lines, proposed structure foundation footprints, and proposed roads and driveways. The map shall identify project fuel modification zones and method of identifying the fuel modification zone boundaries.

602.3.2 Final fire protection plan. Final fire protection plan shall include items listed in Section 602.3.1 and the following:

1. A map identifying all proposed plants in the fuel modification zones with a legend that includes a symbol for each proposed plant species. The plan shall include specific information on each species proposed, including but not limited to:
 - 1.1. The plant life-form
 - 1.2. The scientific and common name
 - 1.3. The expected height and width for mature growth
2. Identification of irrigated and non-irrigated zones.
3. Requirements for vegetation reduction around emergency access and evacuation routes.
4. Identification of points of access for equipment and personnel to maintain vegetation in common areas.
5. Legally binding statements regarding community responsibility for maintenance of fuel modification zones.
6. Legally binding statements to be included in covenants, conditions and restrictions regarding property owner responsibilities for vegetation maintenance.

Reason: This proposal accomplishes two goals: 1) to relocate the Fire Protection Plan requirements to an appropriate location, and 2) enhance the provisions for the fire protection plan to provide guidance to those developing the fire protection plan.

The scope for Chapter 4 states that the chapter contains regulations for water supply and access. The Fire Protection Plan, currently in Section 405, does not fit under either of the Chapter 4 categories. Chapter 6 contains general requirements for fire protection. The provisions for a Fire Protection Plan fit more appropriately in Chapter 6, so they are moved to Section 602.

The California State Fire Marshal's office (SFM) workgroup 2020 was assembled to take on the task of creating a statewide approach for requiring a fire protection plan for any property under consideration to mitigate the wildfire hazards that may exist. This proposal is being submitted to the IWUIC, because the overall response from the design community has been positive. Nationwide consistency leads to further success in application of the code.

The proposal sets a framework for the elements of a fire protection plan to include. This proposal is a baseline of what a general plan shall consist of for evaluating the associated risks with a property and its location within a wildland-urban interface area. A proposed fire protection plan shall be approved before the start of any construction. This will ensure compliance with the requirements in this code. The enforcement of the protection plan starts at the beginning. The Fire Protection Plan is a document that can be referred to at any stage of a project.

Often, a preliminary Fire Protection Plan is submitted to help move a project along and save money for the owner during the different phases of construction. The preliminary Fire Protection Plan sets the groundwork and foundation for the boundaries of the project. This information is vital for planning departments and for cost analysis to be considered early on.

A final Fire Protection Plan includes all the requirements of the preliminary plan with the added landscaping details that may not have been completed in the early phase of a project. The code official will now have a complete document of the project and the planned fire protection to ensure the safety of the community, neighbors, and first responders. These documents and information will help first responders pre-plan for an incident.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The choice to require a fire protection plan is at the discretion of the code official. The design professional will typically incorporate any design criteria in the project cost. This is already a typical practice.

WUIC13-24

IWUIC: 501.1

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

501.1 Scope.

Buildings and structures shall be constructed in accordance with the *International Building Code* and this code.

Exceptions:

1. Accessory structures ~~not exceeding 120 square feet (11 m²) in floor area and agricultural buildings where located not less than 50 feet (15 240 mm) or more from buildings containing habitable spaces~~ are not required to comply with this code.
2. ~~Agricultural buildings not less than 50 feet (15 240 mm) from buildings containing habitable spaces.~~

Reason: Based on the current language, detached accessory structures can essentially be categorized into four groups. These groups are illustrated in Figure 1:

- Group A: Detached accessory structures with a floor area of 120 sq ft and less, located less than 50 feet of the primary structure.
- Group B: Detached accessory structures with a floor area greater than 120 sq ft, located less than 50 feet of the primary structure.
- Group C: Detached accessory structures with a floor area of 120 sq ft and less, located 50 feet or more from the primary structure.
- Group D: Detached accessory structures with a floor area greater than 120 sq ft, located at 50 feet or more from the primary structure.

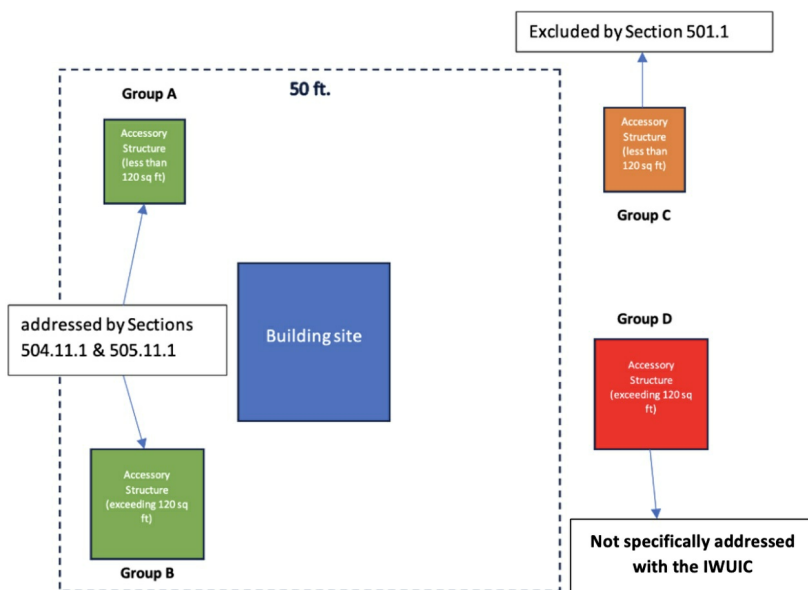


Figure 1. Detached accessory structures condition in 2024 IWUIC Scope.

Section 501.1 exempts Group C from the IWUIC, but all other structures must comply with the IBC and the IWUIC. Furthermore, Sections 504.11 and 505.11 of the IWUIC specifically address Group A and Group B detached accessory structures. Sections 504.11 and 505.11 require exterior walls of detached accessory structures located less than 50 feet from a building containing habitable space to be constructed consistent with the required construction of the exterior walls of primary structure. Group D (located 50 feet or more from the primary building and a floor area exceeding 120 square feet) is not specifically addressed by the IWUIC. The lack of specificity could lead to uncertainty regarding the construction of Group D detached accessory structures. A strict reading of the charging paragraph of Section

501.1, would necessitate compliance with all the requirements detailed in both the IBC and the IWUIC for Group D structures. This would mean that Group D structures would have to meet all the requirements related to ignition resistance class 1 or 2, resulting in construction that is more stringent than Group A and B structures even though Group D structures pose a much lower risk. This is counterintuitive.

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*.

Figure 2. Detached accessory structures requirements for IR Construction classes I.

To address this issue, the proposed language recommends exempting all detached accessory structures located more than 50 feet away from a habitable building from the scope of IWUIC. This suggestion is supported by the findings of structure separation experiments conducted by the IBHS and NIST. These experiments indicate that when the separation distance between structures exceeds 50 feet, the risk of conflagration and structure ignition is significantly lower [1-3]. Chapter 7A of the California Building Code also includes similar requirements in Section 710A.3 (Figure 3) and this change will align these two codes from this perspective [4].

710A.3 Where required. Miscellaneous structures that require a permit, and accessory buildings of any size, when separated from an applicable building on the same lot by a distance of less than 3 feet (914 mm), shall comply with Section 710A.3.1. Accessory buildings that are greater than 120 square feet (11.15 m²), when separated from an applicable building on the same lot by a distance of 3 feet (914 mm) or more but less than 50 feet (15 240 mm) shall comply with Section 710A.3.2.

When required by the enforcing agency, miscellaneous structures that require a permit, and accessory buildings that are 120 square feet (11.15 m²) or less, when separated from an applicable building on the same lot by a distance of 3 feet (914 mm) or more but less than 50 feet (15 240 mm), shall comply with either Section 710A.3.4 or Section 710A.3.3, respectively.

No requirements shall apply to accessory buildings or miscellaneous structures when located 50 feet (15 240 mm) or more from an applicable building on the same lot.

Figure 3. 2022 California Building Code, Chapter 7A, Section 710A, Accessory Buildings and Miscellaneous Structures [4].

Bibliography:

1. Maranghides, A., Link, E. D., Nazare, S., Hawks, S., McDougald, J., Quarles, S. L., & Gorham, D. J. (2022). *WUI Structure/Parcel/Community Fire Hazard Mitigation Methodology*. Department of Commerce. National Institute of Standards and Technology. <https://doi.org/10.6028/NIST.TN.2205>
2. Maranghides, A., Nazare, S., Hedayati, F., Gorham, D., Link, E., Hoehler, M., ... & Walton, W. (2022). *Structure Separation Experiments: Shed Burns without Wind*. National Institute of Standards and Technology, US Department of Commerce. <https://doi.org/10.6028/NIST.TN.2235>
3. Maranghides, A., Nazare, S., Butler, K. M., Johnsson, E. L., Link, E., Bundy, M., ... & Frievalt, F. (2023). *NIST Outdoor Structure*

4. 2022 California Building Code, California code of regulation, Title 24, Part 2 (Volumes 1 & 2) with Jan 2023 Errata, [Section 710A.3](#).

Cost Impact: Decrease

Estimated Immediate Cost Impact:

\$0 or less. This proposed code change provides clarity for detached accessory structures with floor areas exceeding 120 square feet and located 50 feet or more from the main building. Existing language currently requires these detached accessory structures to comply with the IWUIC. This proposed code change will exclude these structures from these requirements. Consequently, detached accessory structures exceeding 120 square feet in floor area and located more than 50 feet away from the main building will no longer need to comply with all the stipulated conditions of IR Class 1 or 2.

Estimated Immediate Cost Impact Justification (methodology and variables):

This will result in a decrease in the cost of construction for detached accessory structures that have a floor area exceeding 120 square feet and are located 50 feet or more from a building containing habitable space.

WUIC13-24

WUIC14-24

IWUIC: SECTION 202 (New), 501.1, 501.1.1 (New)

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Cary Yballa, Central County Fire Department, Cal FPO (cyballa@ccfd.org)

2024 International Wildland Urban Interface Code

Add new definition as follows:

APPLICABLE BUILDING. A building that has residential, commercial, educational, institutional, or similar occupancy type use.

Revise as follows:

501.1 Scope.

Buildings and structures in a wildland urban interface area shall be constructed in accordance with the *International Building Code* and this code.

Exceptions:

1. Group U ~~A~~ accessory structures not exceeding 120 square feet (11 m²) in floor area where located not less than 50 feet (15 240 mm) from applicable buildings ~~containing habitable spaces.~~
2. Group U ~~A~~ agricultural buildings not less than 50 feet (15 240 mm) from applicable buildings ~~containing habitable spaces.~~

Add new text as follows:

501.1.1 Other codes. The construction requirements in the *International Building Code* or in the *International Residential Code*, as applicable, shall be supplemented by the construction requirements in this chapter. Where there is a conflict between provisions of this code and those of the *International Building Code* or of the *International Residential Code*, the provisions of this code shall apply.

Reason: The definition was added for comprehensibility of what an applicable building is regarding the WUI regulations. Since “applicable building” is only used in the scope, adding a definition can confidently be done without interfering with the meaning of the rest of the publication.

Group U is the only accessory structured allowed exceptions.

Other codes, is a reminder that this code is an overlay to the building or residential code.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal is clean up for the intent of where the Wildland code is to be used and that it is an overlay to the building or residential code.

WUIC14-24

WUIC15-24

IWUIC: 501.3, ICC Chapter 07 (New)

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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.
3. The fire-resistance rating of log wall construction shall be calculated in accordance with the provisions of Section 303 of ICC 400.

Add new standard(s) as follows:

ICC

International Code Council, Inc.
200 Massachusetts Avenue, NW, Suite 250
Washington, DC 20001

400-2022

Standard on the Design and Construction of Log Structures

Staff Analysis: The proposed referenced standard, *Standard on the Design and Construction of Log Structures (ICC 400-2022)*, is currently referenced in the *IBC*.

Reason: This code change simply intends to provide more clarity on fire-performance of log wall construction by requiring the fire-resistance rating of log wall construction to be determined in accordance with ICC 400- Standard for the Design and Construction of Log Structures.

Fire-resistant rated construction is a concept by which to evaluate the fire performance of various assemblies that have been tested in accordance with ASTM E119 or UL263 fire tests [2, 3]. Notably, Section 501.3 includes two exceptions to testing in accordance with ASTM E119 or UL 263 by referring to sections 721 and 722 of the 2024 IBC [4]. These sections in the IBC provide prescriptive construction details and calculation methods to establish the fire resistance of a range of assemblies. However, log wall assemblies are not addressed in either of these sections of the IBC. Considering that the IWUIC references log wall construction in several locations, adding an exception referring to section 303 of ICC 400 will provide needed clarity for determining the fire-resistance rating of log wall construction.

In accordance with the definition provided in Chapter 2, "log wall construction" pertains to construction in which the exterior walls consist of solid wood members, and each of these members has a minimum horizontal dimension of at least 6 inches (152 mm). According to Section 303.2.1 of the ICC400, log wall construction with a minimum dimension of 6 inches can be equated to 1-hour fire-resistant rated construction. Referencing Section 303 of the ICC 400 is important as it validates that these assemblies can achieve a 1-hour fire-resistant rating. By referencing Section 303 of ICC 400, key information about the fire-resistant rating of columns and beams constructed with logs, a common practice in log wall construction, is also included.

Background:

Code change WUIC2-9/10, submitted by Marcelo M. Hirschler [5], added Section 501.3 Fire-resistance-rated construction to the 2012 IWUIC.

Code change WUIC1-13, submitted by Jason Thompson [6], added the Exceptions 1 and 2 to section 501.3 of 2015 IWUIC.

Bibliography:

1. International Code Council, 2022, ICC 400—2022 Standard on the Design and Construction of Log Structures, ISBN: 978-1-955636-38-4. <https://codes.iccsafe.org/content/ICC4002022P1>
2. ASTM E119-20, Standard test methods for fire tests of building construction and material.
3. ANSI/UL 263. (2011). Standard for Fire Tests of Building Construction and Materials.
4. International Code Council, 2024, International building code, ISBN: 978-1-955636-38-4. <https://codes.iccsafe.org/content/ICC4002022P1>
5. Marcelo M. Hirschler, GBH International, representing American Fire Safety Council, [WUIC2-09/10](#)
6. Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards, [WUIC1-13](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change proposal adds a reference to ICC 400 in Section 501.3 and provides to provide clarity to the code regarding log wall construction. ICC 400 is available to the public through the ICC website. This code change will not result any additional cost.

WUIC15-24

WUIC16-24

IWUIC: SECTION 202, 501.4 (New), 501.4.1 (New), 501.4.2 (New), 503.2.1, ASTM Chapter 07 (New)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Delete without substitution:

NONCOMBUSTIBLE. As applied to building construction material means a material that, in the form in which it is used, is either one of the following:

1. Material of which no part will ignite and burn when subjected to fire. Any material conforming to ASTM E136 shall be considered noncombustible within the meaning of this section.
2. Material having a structural base of noncombustible material as defined in Item 1 above, with a surfacing material not over $\frac{1}{8}$ inch (3.2 mm) thick, which has a flame spread index of 50 or less. Flame spread index as used herein refers to a flame spread index obtained according to tests conducted as specified in ASTM E84 or UL 723.

"Noncombustible" does not apply to surface finish materials. Material required to be noncombustible for reduced clearances to flues, heating appliances or other sources of high temperature shall refer to material conforming to Item 1. No material shall be classified as noncombustible that is subject to increase in combustibility or flame spread index, beyond the limits herein established, through the effects of age, moisture or other atmospheric condition.

Add new text as follows:

501.4 Noncombustibility tests. The tests indicated in Section 501.4.1 shall serve as criteria for acceptance of building materials. The term noncombustible does not apply to the flame spread characteristics of interior finish or trim materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

501.4.1 Testing. Materials required to be noncombustible shall be tested in accordance with ASTM E136 and pass the test. Alternately, materials required to be noncombustible shall be tested in accordance with ASTM E2652 using the acceptance criteria prescribed by ASTM E136.

Exception: Materials having a structural base of noncombustible material as determined in accordance with ASTM E136, or with ASTM E2652 using the acceptance criteria prescribed by ASTM E136, with a surfacing of not more than 0.125 inch (3.18 mm) in thickness having a flame spread index not greater than 50 when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible.

501.4.2 Additional requirements. The term noncombustible does not apply to surface finish materials. Material required to be noncombustible for reduced clearances to flues, heating appliances or other sources of high temperature shall refer to material conforming to the requirements of ASTM E136.

Revise as follows:

503.2.1 Noncombustible material.

Material shall comply with the requirements for noncombustible materials in Section 501.4 ~~definition of noncombustible materials in Section 202.~~

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

Staff Analysis: The proposed referenced standard, ***Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 °C, 2022 (ASTM E2652-18)***, is currently referenced in the IBC.

Reason: FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

It has been a recent practice in ICC codes that definitions should not contain requirements but just concepts. This proposal does exactly that.

This proposal deletes the definition of noncombustible from section 202 of the IWUIC and adds the exact requirements for noncombustibility from section 703 of the IBC into a new section. This makes the requirements for noncombustible materials consistent with those in the IBC (with the same language). Additionally, this proposal retains the added requirements from the IWUIC regarding surface finish materials and materials close to flues or heating appliances.

This proposal is also consistent with other ICC codes and with the requirements of ASTM E136. Note that materials can be noncombustible in accordance with ASTM E136 and yet exhibit some limited flaming.

This proposal also deletes a definition with requirements and incorporates the requirements into the section of the code that deals with Special Building Construction Regulations (Chapter 5) in the General section. This proposal also revises section 503.2.1 that sends the code user to section 202 for the “requirements” for noncombustible materials, now sending the user to the new section 501.4

Comment: Since neither “flues, heating appliances and sources of high temperature” nor “interior finish” are regulated by the IWUIC, a simpler solution would be not to add proposed new section 501.4.2.

See the following from other ICC codes.

1. The IBC does not have a definition for noncombustible material but section 703.3 states as shown below, which is exactly what this proposal does. It is based on
2. The IRC defines as follows: “NONCOMBUSTIBLE MATERIAL. A material that passes ASTM E136.”
3. The IFC does not have a definition.
4. The IMC defines as follows: “NONCOMBUSTIBLE MATERIAL. A material that passes ASTM E136.”

If a material is tested to ASTM E136 it will pass the test requirements even if it ignites (a bit) and has some burning and some mass loss (see the actual language below). Therefore, saying (as the IWUIC says now in item 1) that “no part will ignite or burn” is inconsistent with many materials that pass ASTM E136.

Two different pieces of equipment are used to pass ASTM E136. The first one (now called Option A) is the equipment that was always in ASTM E136. The second one, called Option B, uses the equipment in ASTM E2652 but the acceptance criteria are the same for both pieces of equipment and are in section 15 of ASTM E136. The language from the IBC and ASTM E136 is shown below.

IBC section 703 states as follows (and a change will be proposed to add the words “and pass the test”):

703.3 Noncombustibility tests. The tests indicated in Section 703.3.1 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Types I, II, III and IV construction. The term “noncombustible” does not apply to the *flame spread* characteristics of *interior finish* or *trim* materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or *flame spread* beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

703.3.1 Noncombustible materials. Materials required to be noncombustible shall be tested in accordance with ASTM E136. Alternately, materials required to be noncombustible shall be tested in accordance with ASTM E2652 using the acceptance criteria prescribed by ASTM E136.

Exception: Materials having a structural base of noncombustible material as determined in accordance with ASTM E136, or with ASTM E2652 using the acceptance criteria prescribed by ASTM E136, with a surfacing of not more than 0.125 inch (3.18 mm) in thickness

having a flame spread index not greater than 50 when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible.

ASTM E136 states as follows when it requires that a material pass the test:15. Report

15.1 Report the material as passing the test if at least three of the four test specimens tested meet the individual test specimen criteria detailed either in 15.2 or in 15.3. The three individual test specimens do not need to meet the same individual test specimen criteria.

15.2 If the weight loss of an individual test specimen is 50 % or less, that test specimen is considered as having met the individual test specimen criteria when all the criteria in 15.2.1 through 15.2.3 are met:

15.2.1 For the duration of the test, the recorded temperature of the surface thermocouple does not rise more than 30 °C (54 °F) above the stabilized furnace temperature established at T2 prior to the test.

15.2.2 For the duration of the test, the recorded temperature of the interior thermocouple does not rise more than 30 °C (54 °F) above the stabilized furnace temperature established at T2 prior to the test.

15.2.3 There is no flaming from the test specimen after the first 30 s.

15.3 If the weight loss of an individual test specimen exceeds 50 %, that test specimen is considered as having met the individual test specimen criteria when all the criteria in 15.3.1 through 15.3.3 are met:

15.3.1 For the duration of the test, the recorded temperature of the surface thermocouple does not rise above the stabilized furnace temperature established at T2 prior to the test.

15.3.2 For the duration of the test, the recorded temperature of the interior thermocouple does not rise above the stabilized furnace temperature established at T2 prior to the test.

15.3.3 There is no flaming from the test specimen at any time during the test.

15.4 Report whether the apparatus for Option A or the apparatus for Option B was used.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal will not have any cost impact. It simply moves a definition with requirements into an appropriate section in the chapter that deals with materials.

WUIC16-24

WUIC17-24

IWUIC: 503.1, 503.2, 503.2.3, 503.2.4, 503.2.4.1, 503.2.4.2, 503.2.4.3, 503.2.4.3.1, 503.2.4.3.2, 503.2.4.3.3, 503.3 (New)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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 building materials shall comply with the requirements of Section 503.2. Materials required to be fire-retardant-treated wood roof coverings shall comply with the requirements of Section 503.3.

503.2 Ignition-resistant building material.

Ignition-resistant building materials shall comply with any one of the requirements in Section 503.2.1 through 503.2.3 ~~503.2.4~~.

~~503.2.3~~ **Fire-retardant-treated wood roof coverings.**

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

~~503.2.4~~ **503.2.3 Ignition-resistant building material.**

Material shall be tested on the front and back faces in accordance with the extended ASTM E84 or UL 723 test, for a total test period of 30 minutes, or with the ASTM E2768 test. The materials shall bear identification showing the fire test results. Panel products shall be tested with a ripped or cut longitudinal gap of $\frac{1}{8}$ inch (3.2 mm). The materials, 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, shall comply with Sections 503.2.3.1 through 503.2.3.3 ~~503.2.4.1 through 503.2.4.3~~.

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.

~~503.2.4.1~~ **503.2.3.1 Flame spread.**

The material shall exhibit a flame spread index not exceeding 25.

~~503.2.4.2~~ **503.2.3.2 Flame front.**

The material shall exhibit a flame front that does not progress more than 10 feet 6 inches (3200 mm) beyond the centerline of the burner at any time during the test.

~~503.2.4.3~~ **503.2.3.3 Weathering.**

Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. The materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in Sections 503.2.3.3.1 through 503.2.3.3.3 ~~503.2.4.3.1 through 503.2.4.3.3~~, as applicable to the materials and conditions of use.

~~503.2.4.3.1~~ **503.2.3.3.1 Evaluation requirements for weathering.**

Fire-retardant-treated wood, wood-plastic composite materials and plastic lumber materials shall be evaluated after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898.

~~503.2.4.3.2~~ **503.2.3.3.2 Wood-plastic composite materials.**

Wood-plastic composite materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first

testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D7032 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

~~503.2.4.3.3~~ 503.2.3.3.3 Plastic lumber materials.

Plastic lumber materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D6662 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

Add new text as follows:

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

Reason: Fire-retardant-treated wood roof coverings are a different class of materials than the other ignition resistant building materials in section 503.2 since they cannot be used for exterior walls or exterior appendages and projections, but are intended explicitly for roofs. However, sections 504.5, 504.7, 505.5, and 505.7, all allow the use of "Ignition-resistant building materials in accordance with Section 503.2." for those applications. That is incorrect. This change would not affect any requirement for fire-retardant-treated wood roof coverings, since they are not explicitly called for anywhere in the IWUIC.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is simply clarification. See also the proponent's reason statement.

WUIC17-24

WUIC18-24

IWUIC: 501.3, SECTION 503, 503.1, 503.2, 503.2.1, 503.2.2, 503.2.3, 503.2.4, 503.2.4.1, 503.2.4.2, 503.2.4.3, 503.2.4.3.1, 503.2.4.3.2, 503.2.4.3.3, 503.3 (New)

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Delete without substitution:

~~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.~~

Revise as follows:

SECTION 503 ~~IGNITION-RESISTANT CONSTRUCTION AND MATERIAL MATERIALS~~

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 for the ignition-resistant construction classes to be ignition-resistant materials shall comply with the requirements of Section 503.2~~this section~~.

503.2 Ignition-resistant building material.

Ignition-resistant building materials shall comply with any one of the requirements in Section 503.2.1 through 503.2.4.

503.2.1 Noncombustible material.

Material shall comply with the definition of *noncombustible* materials in Section 202.

503.2.2 Fire-retardant-treated wood.

Fire-retardant-treated wood shall be identified for exterior use and shall meet the requirements of Section 2303.2 of the *International Building Code*.

503.2.3 Fire-retardant-treated wood roof coverings.

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

503.2.4 Ignition-resistant building material.

Material shall be tested on the front and back faces in accordance with the extended ASTM E84 or UL 723 test, for a total test period of 30 minutes, or with the ASTM E2768 test. The materials shall bear identification showing the fire test results. Panel products shall be tested

with a ripped or cut longitudinal gap of $\frac{1}{8}$ inch (3.2 mm). The materials, 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, shall comply with Sections 503.2.4.1 through 503.2.4.3.

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.

503.2.4.1 Flame spread.

The material shall exhibit a flame spread index not exceeding 25.

503.2.4.2 Flame front.

The material shall exhibit a flame front that does not progress more than 10 feet 6 inches (3200 mm) beyond the centerline of the burner at any time during the test.

503.2.4.3 Weathering.

Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. The materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in Sections 503.2.4.3.1 through 503.2.4.3.3, as applicable to the materials and conditions of use.

503.2.4.3.1 Evaluation requirements for weathering.

Fire-retardant-treated wood, wood-plastic composite materials and plastic lumber materials shall be evaluated after weathering in accordance with Method A “Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing” in ASTM D2898.

503.2.4.3.2 Wood-plastic composite materials.

Wood-plastic composite materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D7032 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

503.2.4.3.3 Plastic lumber materials.

Plastic lumber materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D6662 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

Add new text as follows:

503.3 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 for exposure from the exterior side of the assembly

Exceptions:

1.	<u>The fire-resistance rating of building elements, components or assemblies based on the prescriptive designs prescribed in Section 721 of the <i>International Building Code</i> for exposure from the exterior side of the assembly.</u>
2.	<u>The fire-resistance rating of building elements, components or assemblies based on the calculation procedures in accordance with Section 722 of the <i>International Building Code</i> for exposure from the exterior side of the assembly.</u>

Reason: This proposal relocates a construction method to a more appropriate section and refines the code language to ensure its seamless integration in the new location. In the 2024 IWUIC, Section 501.3, on which addresses the qualification of fire-resistance-rated construction, is located in Section 501, the general section of Chapter 5. Typically, these general sections focus primarily on the scope and purpose of each chapter. Listing construction methods within Section 501 is not consistent with the other general sections of the IWUIC. For clarification purposes, this proposal relocates Section 501.3 to new Section 503.3. Section 503 is specifically dedicated to

matters related to construction and materials. The title of section 503 is proposed to be changed from ignition-resistant construction and material to construction and material to construction and materials. The charging paragraph in Section 503.1 has been refined to ensure that the relocation of Section 501.3 to new Section 503.3 will be correlated with this relocation.

Background

In 2012, Section 501.3 was introduced to IWUIC as part of WUIC2-9/10 [1]. Then, in 2015, exceptions 1 and 2 were incorporated into this section via a proposal brought forth by WUIC1-13 [2].

Bibliography:

1. Marcelo M. Hirschler, GBH International, representing American Fire Safety Council, [WUIC2-09/10](https://www.iccsafe.org/wp-content/uploads/IWUIC1.pdf), <https://www.iccsafe.org/wp-content/uploads/IWUIC1.pdf>
2. Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards, [WUIC1-13](https://www.iccsafe.org/wp-content/uploads/11-IWUIC.pdf), <https://www.iccsafe.org/wp-content/uploads/11-IWUIC.pdf>

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change proposal is strictly a clarification. Relocating existing Section 501.3 to new Section 503.3 pertaining to construction and material will not result in a technical changes to the code. As a result, the proposal will not have an impact on construction costs, either positively or negatively.

WUIC18-24

WUIC19-24

IWUIC: SECTION 503, 503.1, 503.2, 503.2.1, 503.2.2, 503.2.3, 503.2.4, 503.2.4.1, 503.2.4.2, 503.2.4.3, 503.2.4.3.1, 503.2.4.3.2, 503.2.4.3.3

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

SECTION 503 ~~IGNITION-RESISTANT CONSTRUCTION AND MATERIAL~~ MATERIALS

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 for ignition-resistant construction classes to be ignition-resistant materials shall comply with the requirements of Section 503.2~~ this section.

Delete without substitution:

~~503.2 Ignition-resistant building material.~~

~~Ignition-resistant building materials shall comply with any one of the requirements in Section 503.2.1 through 503.2.4.~~

Revise as follows:

~~503.2.1~~ 503.2 Noncombustible material.

Material shall comply with the definition of *noncombustible* materials in Section 202.

~~503.2.2~~ 503.3 Fire-retardant-treated wood.

Fire-retardant-treated wood shall be identified for exterior use and shall meet the requirements of Section 2303.2 of the *International Building Code*.

~~503.2.3~~ 503.4 Fire-retardant-treated wood roof coverings.

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

~~503.2.4~~ 503.5 Ignition-resistant building material.

Material shall be tested on the front and back faces in accordance with the extended ASTM E84 or UL 723 test, for a total test period of 30 minutes, or with the ASTM E2768 test. The materials shall bear identification showing the fire test results. Panel products shall be tested with a ripped or cut longitudinal gap of $\frac{1}{8}$ inch (3.2 mm). The materials, 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, shall comply with Sections 503.2.4.1 through 503.2.4.3.

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.

~~503.2.4.1~~ 503.5.1 Flame spread.

The material shall exhibit a flame spread index not exceeding 25.

~~503.2.4.2~~ 503.5.2 Flame front.

The material shall exhibit a flame front that does not progress more than 10 feet 6 inches (3200 mm) beyond the centerline of the burner at any time during the test.

~~503.2.4.3~~ 503.5.3 Weathering.

Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. The materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in Sections 503.2.4.3.1 through 503.2.4.3.3, as applicable to the materials and conditions of use.

~~503.2.4.3.1~~ 503.5.3.1 Evaluation requirements for weathering.

Fire-retardant-treated wood, wood-plastic composite materials and plastic lumber materials shall be evaluated after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898.

~~503.2.4.3.2~~ 503.5.3.2 Wood-plastic composite materials.

Wood-plastic composite materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D7032 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

~~503.2.4.3.3~~ 503.5.3.3 Plastic lumber materials.

Plastic lumber materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D6662 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

Reason: This code change is intended to provide some clarification on the types of materials permitted for the various ignition resistant construction classes. The current language in Section 503.2 is problematic for the following reasons:

1. Inconsistent usage of the term "ignition-resistant building material":

The term "Ignition-resistant building material" is used both for section and subsection titles, causing confusion when the code refers to materials with ignition-resistant properties. For instance, "Ignition-resistant material" is mentioned twice in Section 504.3 and once in Section 505.5 without specific references to any section. Given the context and the extensive list of materials in each section, it is apparent that the code refers to Section 503.2.4. However, in all other instances with a similar situation, Section 503.2 is referenced for ignition-resistant materials, which leads to confusion.

2. Inclusion of Noncombustible Materials Under "Ignition-resistant building material":

From an ignition perspective, materials can be categorized into two distinct groups: combustible vs noncombustible materials. Combining these two groups under a single category and labeling them all as "Ignition-resistant building material" appears to compromise the classification of noncombustible building materials. According to definitions provided in Section 202 of 2024 IWUIC and Section X1.2 of ASTM E136 [1], noncombustible materials are material of which no part "will ignite" and burn when subjected to fire. Section 202 also defines Ignition-resistant building material. Although the definition doesn't explicitly say the material "can ignite" and burn, it is implied that these materials can ignite and burn.

3. Redundancy in Reference to Fire-retardant-treated Wood Material:

Fire-retardant-treated wood material has a well-established definition provided in Section 2303.2 of the IBC which is also referenced in Section 503.2.2 for Fire-retardant-treated wood. Additionally, the IWUIC code references Section 2303.2 of the IBC 18 times. In many of these cases, ignition-resistant building material is presented as an alternative according to the code. Merging these two types of materials and referencing Section 503.2 for ignition-resistant building material would introduce redundancy in the code. Fire-retardant-treated wood has had a defined status in the IBC since 2003, primarily related to wood products impregnated with chemicals, whereas the definition of ignition-resistant building materials was introduced only in IWUIC since 2009 and pertains to composite materials. They

should be maintained as separate categories.

4. Discrepancy Between Section 503.2.3 and definition of building materials:

Section 503.2.3 references "fire-retardant-treated wood roof covering" as a roof "assembly" comprising fire-retardant-treated wood shingles and shakes. It also requires compliance with the International Building Code Section 1505.6 and classification as Class A roof assemblies, as mandated in Section 1505.2. This assembly concept conflicts with the definition of building materials.

The proposed language changes do not introduce any technical alterations but rather tackle the listed concerns by recommending individual sections for each one of these materials and refining the code language to ensure its smooth incorporation into the new format.

Bibliography:

1. ASTM Standard E136, 2022, " Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C," ASTM International, DOI: 10.1520/E0136-22, www.astm.org.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is administrative cleanup language and does not propose technical alterations to the code provisions. As a result, the proposal will not have an impact on construction costs, either positively or negatively.

WUIC19-24

WUIC20-24

IWUIC: TABLE 503.1

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

TABLE 503.1 IGNITION-RESISTANT CONSTRUCTION CLASSIFICATION^a

DEFENSIBLE SPACE ^{ea}	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply ^b		Water Supply ^b		Water Supply ^b	
	Conforming ^{ab}	Nonconforming ^{ac}	Conforming ^{ab}	Nonconforming ^{ac}	Conforming ^{ab}	Nonconforming ^{ac}
Less than required by Table 603.2	IR Class 2	IR Class 1	IR Class 1	IR 1 N.C.-Rated ^d	IR 1 N.C.-Class 1 ^d	Not Permitted ^{NP}
Conforming/Complies with Table 603.2	IR Class 3	IR Class 2	IR Class 2	IR Class 1	IR Class 1	IR 1 N.C.-Class 1 ^d
1.5x Conforming/150% or more of distance required in Table 603.2	Not Required ^{NR}	IR Class 3	IR Class 3	IR Class 2	IR Class 2	IR Class 1

NP = Not Permitted; NR = Not Required; Class 1 = Ignition-resistant construction in accordance with Section 504; Class 2 = Ignition-resistant construction in accordance with Section 505; Class 3 = Ignition-resistant construction in accordance with Section 506.

- a. ~~Access shall be in accordance with Section 403. Distance of defensible space provided on all sides of structure as required in Table 603.2.~~
- b. ~~Subdivisions shall have a conforming water supply in accordance with Section 402.1. A conforming water supply complying with Section 404.~~
 - 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. 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.~~
- d. ~~Conformance based on Section 404. In addition to Class 1 construction, the exterior walls shall comply with any of the following:~~
 - 1. ~~Exterior walls having a fire-resistance rating of 1 hour or more with a noncombustible exterior wall covering.~~
 - 2. ~~Exterior walls constructed of heavy timber members.~~
 - 3. ~~Exterior walls of log wall construction.~~
- 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.~~

Reason: FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC](#)

Website

This proposal intends to clarify the application of Table 503.1.

IR 1 through IR 3 are replaced with Class 1 through Class 3. This is consistent with the terminology in the charging section, Section 503.1, and Sections 504, 505 and 506.

Nonconforming and conforming under defensible space is clarified as to what the conformance is referencing—the width of defensible space, or the distance from the structure.

The “IR 1 N.C.” term is replaced with “rated”. Footnote d specifies that rated construction consists of Class 1 ignition-resistant construction and the protection of the exterior walls is increased to one of the 3 options in Footnote d.

For additional clarification, the designation “NP” is intended to mean that any construction in areas with these risk factors is not permitted.

The designation “NR” is intended to mean that ignition resistant construction is not required for exterior walls. All other applicable requirements still apply.

There are three separate code changes dealing with IWUIC Table 503.1. Attached PDF shows the end goal for Table 503.1.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is an editorial clarification that does not impact cost. See also the proponent’s reason statement.

WUIC20-24

WUIC21-24

IWUIC: TABLE 503.1

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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 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.
- f. In accordance with an approved Vegetation Management Plan in accordance with Section 502.2

Reason: FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

This proposal changes the requirement for ignition-resistant construction where the site has 1.5x required defensible space, a conforming water supply in a Moderate Hazard zone from “not required” to a requirement for IR3 construction. The IWUIC has been updated over the past several cycles to enhance the requirements for ignition-resistant construction to achieve a minimum level of building fire resistance/endurance from WUI fires. The Table needs to be updated to require a minimum level of ignition-resistance construction for all conditions and not simply exempt such minimum requirements based on a conforming water supply, as is currently the IWUIC allowance.

Where a dwelling is located in the Moderate Hazard area, the “not required” currently means it has no ignition-resistant construction. There are three separate code changes dealing with IWUIC Table 503.1. The PDF attached shows the end goal for Table 503.1.

Cost Impact: Increase

Estimated Immediate Cost Impact:

The cost for construction in a Moderate Hazard Fire Severity zone with a conforming water supply provided with the 1.5x required defensible space is estimated to add approximately 1% to the total cost of construction materials for the building.

Estimated Immediate Cost Impact Justification (methodology and variables):

This proposal will increase the cost of construction by the cost of providing IR 3 construction in a moderate hazard zone, but only for structures which would have benefited from providing the 150% distance.

WUIC21-24

WUIC22-24

IWUIC: 402.2.2, 404.1, 503.1, TABLE 503.1

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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 Section 404.

~~Exception~~ Exceptions:

- ~~1. Structures constructed to meet the requirements for the class of ignition-resistant construction specified in Table 503.1 for a nonconforming water supply.~~
- ~~2. Buildings containing only private garages, carports, sheds and agricultural buildings with a floor area of not more than 600 square feet (56 m²).~~

404.1 General.

~~Where provided in order to qualify as a conforming water supply for the purpose of Table 503.1 or as required for new subdivisions in accordance with Section 402.1.2, an An approved water source shall have an adequate water supply for the use of the fire protection service to protect buildings and structures from exterior fire sources or to suppress structure fires within the *wildland-urban interface area* of the jurisdiction in accordance with this section.~~

Exception: Buildings containing only private garages, carports, sheds and agricultural buildings with a floor area of not more than 600 square feet (56 m²).

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 building materials shall comply with the requirements of Section 503.2.

TABLE 503.1 IGNITION-RESISTANT CONSTRUCTION^a

Portions of table not shown remain unchanged.

DEFENSIBLE SPACE ^{ea}	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply ^b		Water Supply ^b		Water Supply ^b	
	Conforming ^c	Nonconforming ^c	Conforming ^c	Nonconforming ^c	Conforming ^c	Nonconforming ^c
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.~~

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.

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.

ea. 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.~~

Reason: FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

The footnote reference to Section 403 (Access) is removed as not necessary. Compliance with Section 403 is required and a footnote "pointer" is redundant.

The footnote reference to Section 404 (Water Supply) is deleted in accordance with deletion of the Water Supply references in the Table Water supply in accordance with Section 404 should be provided for all new construction. As a tool for fire suppression and structure hazard mitigation during a WUI fire, firefighters may not be available to protect structures, so in that instance water supply would not reduce the fire risks or be an effective mitigation. Removing water supply puts the emphasis for protection of structures from wildland fire onto the construction of the building to be ignition resistant and the defensible space.

There are three separate code changes dealing with IWUIC Table 503.1. The PDF attached shows the end goal for Table 503.1.

Cost Impact: Increase

Estimated Immediate Cost Impact:

Chapter 5 and Table 503.1 are the requirements for newly built structures and subdivisions in areas regulated by the IWUIC. Accordingly, a compliant water supply should always be provided or addressed through approved alternative methods or materials as allowed by the code. The application of this Table as currently written allows for a reduction in required IR Construction materials when the water supply complies with what is already required by this code,

The cost of construction will be increased based on this proposal as compared to the cost reduction (allowance) that is currently provided. That cost will be based on the difference of IR 3 construction vs. IR 2 or IR 2 vs IR1.

Estimated Immediate Cost Impact Justification (methodology and variables):

The cost of construction will be increased based on this proposal as compared to the cost reduction (allowance) that is currently provided. That cost will be based on the difference of IR 3 construction vs. IR 2 or IR 2 vs IR1. That cost would typically not exceed 1-2% of overall construction cost, but is variable based on the size of the building and the choice of building materials chosen to comply.

WUIC22-24

WUIC23-24

IWUIC: TABLE 503.1

Proponents: Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

2024 International Wildland Urban Interface Code

Revise as follows:

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.
1.5x 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.

Reason: This proposal eliminates the last row in Table 503.1. The deleted row only applies where a structure provides a defensible space distance that is 150% or more of a conforming defensible space. Section 503.1 states that the requirements in Table 503.1 only apply to new construction or new structures. Therefore, existing structures which may not have any ignition-resistant construction are not affected by this table.

But for new construction, this provision is at minimum vague and confusing; and then it creates a situation which is nearly impossible to properly enforce for the life of the structure. The provision in the table is based on 150% times a conforming defensible space, and Footnote c directs the user to Section 603. However, this is not clear whether the provision applies to defensible space being 150% of the width required in Table 603.2; or if it means the trees within the defensible space are separated 150% of the distance required in Section 603.2.2; or both.

As far as enforcing this provision for the life of the structure, consider Structure X in the WUI. Structure X is located in the Moderate Hazard area with a conforming water supply. Structure X provides a 150% increase in the distances required in both Table 603.2 and Section 603.2.2, so at the time of construction ignition-resistant building materials are not required. This design complies with Table 503.1 at the time of construction. Three years later, the code official is conducting an inspection of the area for maintenance of the defensible space. The code official will not be aware of the fact that the structure was required to maintain a 45' defensible space, so the code official will require the 30' defensible space requirement similar to all other structures in the Moderate Hazard area.

The only way to determine whether an owner must provide 150% of defensible space is to go back to the original plans and research the applicable code at the time of construction, then determine if the construction of the structure complies or not. While this is a valid avenue for enforcement, we all know that this amount of effort will not be put into every inspection. In fact, I would not be surprised if it is not put into **any** inspection. Most likely, the inspector will simply require the conforming distance as he/she did on every adjacent neighbor. In this fashion, it is an easier inspection; it looks acceptable; and the inspector moves on to next property.

Each year during the spring and early summer, a single WUI inspector can perform hundreds of inspections daily. If the information for a specific lot is not readily available, the provision will be lost. In doing so, the structure now should have been constructed of Class 3 ignition-resistant construction.

Additionally, Structure A is located in the Moderate Hazard area, but was allowed to be constructed with no ignition-resistant construction, not even a fire-resistance-rated roof. The rating of the roof covering is required for Classes 1, 2 and 3 ignition-resistant construction, but Dwelling A did not have to comply since 150% of the defensible space was provided. It is a frequent occurrence that structures are ignited ahead of the fire front by burning embers pushed ahead of the fire and landing on the rooftop. But Dwelling A does not have a rated roof. The 45' defensible space protects from radiant heat and direct flame impingement. The roof is not protected, and Dwelling A is lost when the roof ignites from burning embers.

Some may argue that Dwelling A will be saved because there is a conforming water supply. However, even the best water supply is of no benefit when there are no firefighters available to utilize it. When there are multiple structures needing protection, the Incident Commander will decide where to deploy the firefighters because there are more structures than firefighters and fire engines. Structure A has a 45' defensible space, while others only have the required 30' distance. It is likely that it will be decided that Structure A is less vulnerable because of the increased defensible space and firefighters will be sent to other structures. The water supply does not improve the survivability of Structure A at all in this case.

The concept to allow credit for 150% of the defensible space is flawed and difficult to maintain throughout the life of the structure. The entire row and this allowance should be removed from the code.

Cost Impact: Increase

Estimated Immediate Cost Impact:

This proposal will increase the cost of construction, but only for structures which would have benefited from providing the 150% increase in the defensible space requirements. However, the construction increase will be offset by the one-third reduction in labor for annual pruning and trimming of the vegetation within the defensible space.

Estimated Immediate Cost Impact Justification (methodology and variables):

Utilizing ignition-resistant construction materials will increase the construction cost for the exterior walls, deck and roof by 15%.

WUIC23-24

WUIC24-24

IWUIC: TABLE 503.1

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

TABLE 503.1 IGNITION-RESISTANT CONSTRUCTION^a

DEFENSIBLE SPACE ^c	FIRE HAZARD SEVERITY					
	Moderate Hazard		High Hazard		Extreme Hazard	
	Water Supply ^d		Water Supply ^d		Water Supply ^d	
	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 on the exterior 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.

Reason: The intent of this proposal is to provide clarity regarding Note b of Table 503.1 to prevent potential misinterpretation.

New text is proposed to be added to clarify that the required 1-hour fire-resistance rating (FRR) specified in Note b must be applied on the exterior side of the wall assembly. This is consistent with the language in Section 504.5 (IR1) and Section 505.5 (IR2) and will provide consistency across instances where a 1-hour FRR is used to protect exterior walls.

The second proposed change intends to clarify the use of log wall construction in Note b. In extreme wildfire hazard condition, where defensible space is nonconforming, Table 503.1 necessitates both a 1-hour FRR "and" a noncombustible exterior surface for exterior walls. Nonconforming defensible space denotes a situation where, in addition to exposure to embers and radiant heat, the structure faces a direct flame exposure risk from adjacent fuel loads during a wildfire. In such instances, the code mandates that wall assemblies fulfill two sets of criteria:

1. A 1-hour fire-resistant rating to shield exterior walls against fire impingement.
2. A noncombustible exterior surface to impede the spread of fire on the external wall surfaces.

Acknowledging that log wall construction, as defined, can attain a 1-hour fire resistance rating, this proposal seeks to make clear that "all" wall assemblies meeting the 1-hour fire-resistant rating, including those employing log wall construction, are acceptable, if they are protected by noncombustible exterior siding.

Construction incorporating heavy timber elements boasts a rich global history.

Figure 1 illustrates five types of construction typical of such elements [1]:

1. Log wall construction,
2. Heavy timber construction,
3. Post and beam construction,
4. Panelized construction, and,
5. Hybrid construction.

Log wall construction historically originated in the northern European region where a Nordic climate, characterized by cold, humid winters and mild, humid summers, made log wall construction desirable. Over time, advancements in the wood industry and environmental considerations led to the introduction of engineered wood products like glue laminated timber (Glulam), laminated veneer lumber (LVL), and cross laminated timber (CLT). This marked a shift from traditional heavy timber and log wall construction to contemporary post and beam, panelized construction, and hybrid construction. Consequently, log wall construction is now primarily practiced in wildland areas of United States facing varying degrees of wildfire hazard. Numerous studies conclude that heavy timber members, including logs thicker than 6 inches, are inherently fire-resistant and can withstand fires by charring [1]. However, concerns exist about the safety of these combustible materials regarding flame spread on their exterior surfaces. Flame spread on the exterior surfaces of combustible materials, including different wood species, poses a risk of fire spreading to other parts of buildings at varying rates. The requirement for a noncombustible exterior surface in Table 503.1 for IR1 N.C. eliminates the possibility of flame spread on exterior walls. The International Building Code (IBC) also addresses this concern and mandates noncombustible exterior protection in sections 602.4.1 through 602.4.4 for all Type IV buildings (A, B, C, and HT) constructed with heavy timber members, as shown in Figure 2.



Log wall construction



Heavy timber construction



Post and Beam construction



Panelized construction



Hybrid construction

Figure 1. Different types of construction with heavy timber members [1].

Numerous reports of fire incidents around the country confirm the flame spread risk on the exterior surface of log wall construction. The 2013 IBHS post-fire investigation on a fire that occurred in Sevier County, Tennessee with moderate fire hazard severity revealed valuable information on fire characteristics of log wall construction [2]. In this fire incident, the average side-to-side cabin spacing (of those measured on-site and exposed to fire conditions) was 32 feet. While the report states that the buildings observed were not constructed in accordance with WUI requirements, Figure 3 clearly shows how fire can spread quickly on the exterior of log wall construction.

602.4.1 Type IV-A. Building elements in Type IV-A construction shall be protected in accordance with Sections 602.4.1.1 through 602.4.1.6. The required fire resistance rating of noncombustible elements and protected mass timber elements shall be determined in accordance with Section 703.2.

602.4.1.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes, as specified in Table 722.7.1(1). Components of the exterior wall covering shall be of noncombustible material except water-resistive barriers having a peak heat release rate of less than 150kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.2 Type IV-B. Building elements in Type IV-B construction shall be protected in accordance with Sections 602.4.2.1 through 602.4.2.6. The required fire resistance rating of noncombustible elements or mass timber elements shall be determined in accordance with Section 703.2.

602.4.2.1 Exterior protection. The outside face of exterior walls of mass timber construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes, as specified in Table 722.7.1(1). Components of the exterior wall covering shall be of noncombustible material except water-resistive barriers having a peak heat release rate of less than 150kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18MJ/kg as determined in accordance with ASTM E1354, and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.3 Type IV-C. Building elements in Type IV-C construction shall be protected in accordance with Sections 602.4.3.1 through 602.4.3.6. The required fire resistance rating of building elements shall be determined in accordance with Section 703.2.

602.4.3.1 Exterior protection. The exterior side of walls of combustible construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes, as determined in Table 722.7.1(1). Components of the exterior wall covering shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150 kW/m², a total heat release of less than 20 MJ/m² and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m².

602.4.4 Type IV-HT. Type IV-HT (Heavy Timber) construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated heavy timber or structural composite lumber (SCL), without concealed spaces or with concealed spaces complying with Section 602.4.4.3. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, SCL and cross-laminated timber (CLT) and the details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.4.1 or 602.4.4.2 shall be permitted. Interior walls and partitions not less than 1-hour fire-resistance rated or heavy timber conforming with Section 2304.11.2.2 shall be permitted.

Figure 2. IBC requirements for noncombustible protection of Type IV constructions.

According to the IBHS report, “combination of road and fire behavior characteristics created hazardous working conditions for firefighters due to the absence of escape routes, safety zones, and defensible space around buildings. At times, firefighters found themselves in situations where buildings were simply too hazardous to protect and had to be abandoned for their own personal safety.”



Figure 3. Two sequence photos taken by firefighters showing the growth of the fire at a cabin. Photo d has been taken 6 minutes after photo a. Photo credit: Chris Knutsen, Training Captain, Pigeon Forge Fire Department.

Failure to specify that the exterior surface of log wall construction must be noncombustible introduces an inconsistency with heavy timber construction. As currently written it is clear that the code requires heavy timber construction to have a 1-hour fire resistance rating and a noncombustible exterior surface. An incorrect interpretation of Note b in Table 503.1 could imply that log wall construction doesn't require

a noncombustible exterior surface. This would be in conflict with how heavy timber (HT) construction is treated.

Fire incident reports indicate that log wall construction does not provide more resistance against fire spread and flame propagation than other heavy timber members such as Glulam beams and CLT panels. It is also clear that log wall construction does not perform better during a wildfire than other exterior wall assemblies that include noncombustible walls.

Based on current requirements in the IBC and by considering available reports on fire performance of heavy timber, mass timber and log wall construction, the proposed changes to Note b in Table 503.1 clarifies that all different construction methods including log wall construction are permitted if they are protected on the exterior side with a noncombustible surface.

Bibliography:

1. Milad Shabaniyan, 2020, *thermos-mechanical performance of dowelled connections in tall timber structures*. PhD thesis, University of North Carolina at Charlotte.
2. Stephen Quarles, Leon Konz (2016), *Black bear cub fire: March 17, 2013*, Insurance Institute for Business & Home Safety, https://ibhs.org/wp-content/uploads/member_docs/Black-Bear-Cub-Fire-Report_IBHS.pdf

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change proposal is administrative cleanup language, with the sole purpose of enhancing code clarity. As a result, the proposal will not have an impact on construction costs, either positively or negatively.

WUIC24-24

WUIC25-24

IWUIC: 503.2.2

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

503.2.2 Fire-retardant-treated wood.

Fire-retardant-treated wood shall be labeled ~~identified~~ for exterior use and shall meet the requirements of Section 2303.2 of the *International Building Code*.

Reason: This proposal makes a simple change. Chapter 5 refers in some instances to fire-retardant-treated wood as having to be labeled (sections 504.5 and 505.5) and in some instances as having to be identified (sections 503.2.2, 504.7 and 505.7). This proposal simply provides consistency and changes so that all sections state "labeled". Other proposals deal with sections 504.7 and 505.7.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Provides consistency and does not effect cost in any way.

WUIC25-24

WUIC26-24

IWUIC: 503.2.4

Proponents: David Bueche, Hoover Treated Wood Products (dbueche@frtw.com)

2024 International Wildland Urban Interface Code

Revise as follows:

503.2.4 Ignition-resistant building material.

Material shall be tested on the front and back faces in accordance with the extended ASTM E84 or UL 723 test, for a total test period of 30 minutes, or with the ASTM E2768 test. The materials shall bear identification showing the fire test results. Panel products shall be tested with a ripped or cut longitudinal gap of $\frac{1}{8}$ inch (3.2 mm). The materials, 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, shall comply with Sections 503.2.4.1 through 503.2.4.3. The use of paints, coating, stains, or other surface treatments is not an approved method of protection as required in this section.

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.

Reason: Efforts are being made by manufacturers seeking approval for painted, coated, stains, or other surface-treated wood that require continuous maintenance in lieu of ignition-resistant building materials. This proposed addition will clarify that paints, coating, stains, and other types of products with vulnerable surface coatings are not approved for use as ignition-resistant building materials in the wildland-urban interface (WUI).

This language already exists in the International Building Code in Section 2303.2.2 for fire-retardant-treated wood (FRTW), which is one of the categories of ignition-resistant building materials in IWUIC (503.2.2). It is also in the 2021 IRC, Section R802.1.5.2. This language is in NFPA 1140 Standard for Wildland Fire Protection for FRTW and is also in Chapters 7A and 23 of the California Building Code.

Finally, note that the required testing referenced in 503.2#1 would require ignition-resistant building materials to undergo the same testing as FRTW.

Adding this proposed language to 503.2 adds clarity and conformity to codes affecting WUI communities and ensures that any ignition-resistant material will perform as well as FRTW.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The code is silent on use of coatings and clarification is important.

WUIC26-24

WUIC27-24

IWUIC: SECTION 202 (New), 504.2, 504.2.1 (New), 504.8, 505.2, 505.2.1 (New), 505.8, 506.2, 506.2.1 (New), 506.5 (New), NFPA (New), UL Chapter 07 (New)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Add new definition as follows:

EXTERIOR GLAZED DOOR. An operable opening in the building envelope that contains fixed glazing.

Revise as follows:

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 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* 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*.

Add new text as follows:

504.2.1 Skylights. Skylights, including tubular daylighting devices and sloped glazing shall comply with Section 504.8.

Revise as follows:

504.8 Exterior glazing.

Exterior windows, window walls and ~~*exterior glazed doors*~~ glazed door having a glazed area of 25 percent or greater of the door area, windows within exterior doors, and skylights shall be ~~tempered glass,~~ one of the following:

1. Multilayered ~~multilayered~~ glazed panels containing at least one tempered pane or dome; or
2. Glass ~~glass~~-block units; or
3. Have ~~have~~ a minimum fire protection rating of ~~not less than~~ 20 minutes when tested in accordance with NFPA 257 or UL 9, and shall be exempt from the hose stream test.

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 fire-stopped to preclude entry of flames or embers, or have one layer of cap sheet complying with ASTM D3909 installed over the combustible *roof deck*.

Add new text as follows:

505.2.1 Skylights. Skylights, including tubular daylighting devices and sloped glazing shall comply with section 505.8.

Revise as follows:

505.8 Exterior glazing.

Exterior windows, window walls and ~~glazed doors~~ exterior glazed doors having 25 percent or greater of the door area, windows within exterior doors, and skylights shall be ~~tempered glass~~, one of the following:

1. Multilayered ~~multilayered~~ glazed panels containing at least one tempered panel or dome; ; or
2. Glass ~~glass~~ block units; or
3. Have ~~have~~ a fire protection rating of ~~not less than~~ 20 minutes when tested in accordance with NFPA 257 or UL 9, and shall be exempt from the hose stream test.

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 fire-stopped to preclude entry of flames or embers, or have one layer of cap sheet complying with ASTM D3909 installed over the combustible *roof deck*.

Add new text as follows:

506.2.1 Skylights. Skylights, including tubular daylighting devices and sloped glazing shall comply with section 506.5.

506.5 Exterior Glazing. Exterior windows, window walls and exterior glazed doors having a glazed area of 25 percent or greater of the door area, windows within exterior doors, and skylights shall be one of the following:

1. Multilayered glazed panels contain at least one tempered pane; or
2. Glass block units; or
3. Have a minimum fire protection rating of 20 minutes when tested in accordance with NFPA 257 or UL 9, and shall be exempt from the hose stream test.

Add new standard(s) as follows:

NFPA

257-2022

Standard on Fire Test for Window and Glass Block Assemblies

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

UL

9-2009

Fire Tests of Window Assemblies, with Revisions through March 2020

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

Staff Analysis: The proposed referenced standards, are currently referenced in the **IBC**:

- **Standard on Fire Test for Window and Glass Block Assemblies (NFPA 257-22)**
- **Fire Tests of Window Assemblies--with Revisions through March 2020 (UL 9--2009)**

Reason: This proposal provides a definition for “exterior glazed door” to clearly explain this is an exterior door with fixed glazing, commonly referred to as a door lite. Within the Class fire-ignition requirements, the minimum percentage of glazing that would trigger certain requirements is then provided in the sections 504.8, 505.8 and 506.8. Fixed glazing relates to the glazing itself and does not imply that the door is not operable. Further, a glazed door includes various types of doors, including sliding glass doors, side hinged doors, or folding door systems.

In all WUI classes of construction, this proposed requires a least one pane of tempered glass, which has been shown to be effective in the performance to resist fire intrusion. It also adds the NFPA 257 and UL 9 when testing to the fire protection rating but for exempting the hose stream test, which is also exempted in the IBC. The markings to determine NFPA or UL compliance are found within the IBC. The proposal then adds the same exterior glazing requirements Class 3 WUI construction, which currently has no exterior glazing

requirements.

The remaining editorial changes are intended to provide needed clarity to prevent misinterpretations of what is required. Those changes are as follows:

1. Adds a pointer under roof assembly for skylights, tubular daylighting devices and sloped glazing, in order to prevent any confusion that these products fall under roof assembly compliance.
2. Makes formatting edits to the exterior glazing sections so it is clear that one of the three options must be chosen.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: Increase

Estimated Immediate Cost Impact:

Eliminating the option of allowing single-pane tempered that has been in the IWUIC since 2003, will increase costs for manufacturers shifting to provide multilayered glazed panels with at least one tempered pane. Multilayered glazed panels are readily available in the industry and being installed to meet other code requirements. However, this proposal will increase the cost per lite of glass (minimum of one tempered pane); and, when that cost is aggregated to the overall cost of the window, it is estimated to be at least 20% more than annealed glass and the actual cost depends on the size and complexity of the fenestration project.

Further, multilayered glazed panels (i.e. insulating glazing), with at least one tempered pane is a makeup that is not designed for meeting full safety glazing requirements in hazardous locations. This new makeup for the IWUIC is available from only some manufacturers that have been meeting California Code requirements for the last five California code cycles.

The proposal provides for options to meet the exterior glazing requirements laid out. If the NFPA or UL testing option is chosen, there will be an increase in cost associated with this testing because it is not currently a common approach that manufacturers utilize.

Estimated Immediate Cost Impact Justification (methodology and variables):

For manufacturers who have not been manufacturing product for California requirements, the cost will be higher to comply with multilayered glazed panels with at least one tempered pane than for those manufacturers who have been producing this product at a greater rate for California compliance.

One of the options to meet the exterior glazing requirements will be an increase in cost for manufacturers to proceed with the testing to either the UL or NFPA standard; however, many may choose to utilize the other options that are currently in the IWUIC, eliminating that cost increase.

WUIC27-24

WUIC28-24

IWUIC: SECTION 202 (New), 504.2.1 (New), 504.8, 505.2.1 (New), 505.8, 506.2.1 (New), 506.5 (New), NFPA (New), UL Chapter 07 (New)

Proponents: Jennifer Hatfield, J. Hatfield & Associates, Fenestration & Glazing Industry Alliance (formerly AAMA) (jen@jhatfieldandassociates.com); Cesar Lujan, Window & Door Manufacturers Association (clujan@wdma.com)

2024 International Wildland Urban Interface Code

Add new definition as follows:

GLAZED DOOR. Exterior door having a glazed area of 25 percent or greater of the area of the door.

Add new text as follows:

504.2.1 Skylights. Skylights, including tubular daylighting devices and sloped glazing shall comply with Section 504.8

Revise as follows:

504.8 Exterior glazing.

Exterior windows, window walls and glazed doors, windows within exterior doors, and skylights shall be one of the following: ~~tempered glass, multilayered glazed panels, glass block or have a fire protection rating of not less than 20 minutes.~~

1. Multilayered glazed panels containing at least one tempered pane.
2. Glass block units.
3. Have a fire protection rating of not less than 20 minutes when tested in accordance with NFPA 257 or UL 9, and shall be exempt from the hose stream test.

Add new text as follows:

505.2.1 Skylights. Skylights, including tubular daylighting devices and sloped glazing shall comply with Section 505.8

Revise as follows:

505.8 Exterior glazing.

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

1. Multilayered glazed panels containing at least one tempered pane.
2. Glass block units.
3. Have a fire protection rating of not less than 20 minutes when tested in accordance with NFPA 257 or UL 9, and shall be exempt from the hose stream test.

Add new text as follows:

506.2.1 Skylights. Skylights, including tubular daylighting devices and sloped glazing shall comply with Section 506.5.

506.5 Exterior glazing. Exterior windows, window walls and *glazed doors*, windows within exterior doors, and skylights shall be one of the following:

1. Multilayered glazed panels containing at least one tempered pane.

2. Glass block units.

3. Have a fire protection rating of not less than 20 minutes when tested in accordance with NFPA 257 or UL 9, and shall be exempt from the hose stream test.

Add new standard(s) as follows:

NFPA

257--22

Standard on Fire Test for Window and Glass Block Assemblies

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02169-7471

UL

9--2009

Fire Tests of Window Assemblies--with Revisions through March 2020

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

Staff Analysis: The proposed referenced standards, are currently referenced in the IBC:

- ***Standard on Fire Test for Window and Glass Block Assemblies (NFPA 257-22)***
- ***Fire Tests of Window Assemblies--with Revisions through March 2020 (UL 9--2009)***

Reason: This proposal adds a definition for a glazed door in order to provide needed clarity and consistency in what is considered a glazed door, for the purposes of the exterior glazing requirements found in Class 1 and 2, as well as the new Class 3 requirements being proposed. This definition stems from the California Code.

In Class 1 and 2 ignition-resistant construction, this proposed change eliminates a single pane tempered glass, which has been shown to not be as effective in fire barrier performance. It also adds the NFPA 257 Standard on Fire Test for Window and Glass Block Assemblies and UL 9 Fire Tests of Window Assemblies Standard when testing to the fire protection rating, but for exempting the hose stream test that is included in both standards. The hose stream test is also exempted in section 716.2.5.3 of the IBC. The markings to determine NFPA or UL compliance are found within the IBC, as both of these standards are already referenced and utilized in the IBC.

The proposal then adds the same revised exterior glazing requirements for Class 1 and 2 to Class 3 ignition-resistant construction, which currently has no exterior glazing requirements. These Class revisions stem from the California Building and Residential Code and requirements in their Wildland Urban Interface Chapter.

The remaining changes are intended to provide needed clarity to prevent misinterpretations of what is required. Those changes are as follows:

- Adds a new subsection under Class 1, 2 and 3 roof assembly sections for skylights, tubular daylighting devices and sloped glazing. This pointer is to prevent any confusion that these products fall under roof assembly compliance.
- Makes formatting edits to the exterior glazing sections so it is clear that ONE of the now three options must be chosen.

Cost Impact: Increase

Estimated Immediate Cost Impact:

Eliminating the option of allowing single-pane tempered that has been in the IWUIC since 2003, will increase the costs for manufacturers shifting to provide multilayered glazed panels with at least one tempered pane. However, multilayered glazed panels are readily available in the industry and being installed to meet other code requirements. This proposal will increase the cost per lite of glass (minimum of one tempered pane); and, when that cost is aggregated to the overall cost of the window, it is estimated to be at least 20% more than annealed glass and the actual cost depends on the size and complexity of the fenestration project.

Further, multilayered glazed panels (i.e. insulating glazing), with at least one tempered pane is a makeup that is not designed for meeting full safety glazing requirements in hazardous locations. This new makeup for the IWUIC is available from only some manufacturers that have been meeting California Code requirements for the last five California code cycles.

The proposal provides for options to meet the exterior glazing requirements laid out. If the NFPA standard or UL standard testing option is chosen, there will be an increase in cost associated with this testing because it is not currently a common approach that manufacturers utilize.

Estimated Immediate Cost Impact Justification (methodology and variables):

For manufacturers who have not been manufacturing product for California requirements, the cost will be higher to comply with multilayered glazed panels with at least one tempered pane than for those manufacturers who have been producing this product at a greater rate for California compliance.

One of the options to meet the exterior glazing requirements will be an increase in cost for manufacturers to proceed with the testing to either the UL 9 or NGPA 257 standard; however, many may choose to utilize the other options that are currently in the IWUIC, eliminating that cost increase.

WUIC28-24

WUIC29-24

IWUIC: 504.2.1, 505.2.1, 506.2.1

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Wildland Urban Interface Code

Revise as follows:

504.2.1 Roof valleys.

Where provided, valley flashings shall run the full length of the valley and 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 or a roof assembly classified as Class A when tested in accordance with ASTM E108 or UL 790~~running the full length of the valley.~~

505.2.1 Roof valleys.

Where provided, valley flashings shall run the full length of the valley and 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 or a roof assembly classified as Class A when tested in accordance with ASTM E108 or UL 790~~running the full length of the valley.~~

506.2.1 Roof valleys.

Where provided, valley flashings shall run the full length of the valley and 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 or a roof assembly classified as not less than Class B when tested in accordance with ASTM E108 or UL 790~~running the full length of the valley.~~

Reason: Currently, the IWUIC provides only one prescriptive option for constructing roof valleys. The existing prescriptive valley flashing requirement is restrictive and may present long-term issues with function of the installed valley due to abrasion of the corrosion resistant valley metal by granules on the underlying D3909 sheet. The proposal retains the existing option and introduces a performance option which permits a valley to be constructed with an ASTM E108 or UL 790 classified roof assembly equivalent to that required for the roof assembly used in the field of the roof, based on the ignition resistant construction class.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

\$0 or less. The proposal may reduce initial cost of construction in some cases by providing additional options for valley construction.

Estimated Immediate Cost Impact Justification (methodology and variables):

Analogy method. Availability of additional options supports choice.

Estimated Life Cycle Cost Impact:

No change in life cycle cost is anticipated.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

Analogy method. Service life of the alternative valley is expected to equal or exceed that of the existing prescriptive option.

WUIC29-24

WUIC30-24

IWUIC: 504.2, 504.2.2 (New), 505.2, 505.2.2 (New), 506.2, 506.2.2 (New)

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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*.

Add new text as follows:

504.2.2 Flame and ember protection at eaves. For *roof assemblies* where the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall resist flames and embers by one or more of the following methods:

1. Firestopping of the space between the *roof covering* and the *roof deck*.
2. Installation of one layer of 72 pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 over the combustible *roof deck*.

Revise as follows:

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.~~

Add new text as follows:

505.2.2 Flame and ember protection at eaves. For *roof assemblies* where the profile allows a space between the *roof covering* and *roof deck*, the space at the eave ends shall resist flames and embers by one or more of the following methods:

1. Firestopping of the space between the *roof covering* and the *roof deck*.
2. Installation of one layer of cap sheet complying with ASTM D3909 over the combustible *roof deck*.

Revise as follows:

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*.~~

Add new text as follows:

506.2.2 Flame and ember protection at eaves. For *roof assemblies* where the profile allows a space between the *roof covering* and the *roof deck*, the space at the eave ends shall resist flames and embers by one or more of the following methods:

1. Firestopping of the space between the *roof covering* and the *roof deck*.
2. Installation of one layer of cap sheet complying with ASTM D3909 over the combustible *roof deck*.

Reason: As currently configured, roof assembly sections 504.2, 505.2, and 506.2 include two distinct provisions. The first is a requirement for a roof assembly classified as Class A. The second offers two options for addressing flame and ember entry at eaves when the roof covering profile has a space between the roof covering and the roof deck. Including both these requirements in the same section is potentially confusing. In the case of 504.2, these two distinct provisions are followed by a list of exceptions. The exceptions are intended to apply solely to the first provision, i.e., a Class A roof assembly classification. However, based on the current construction of Section 504.2, the exceptions could be interpreted as applying to the second provision as well, which is not the intent.

This proposal places the second provision from 504.2, 505.2, and 506.2 into new subsections for flame and ember protection at eaves. The new subsections incorporate a numbered list of options which can be expanded if other approaches for eave protection are developed. As a final, minor cleanup, an unnecessary "also" is removed from the list of exceptions in section 504.2.

Please note that the discrepancy in the description of D3909 product between existing sections 505.2/506.2 and 504.2 is addressed in a separate proposal. If that separate proposal is successful, the desire is for ICC staff to carry the change to 504.2 offered in that proposal forward into new section 504.2.2 of this proposal.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal rearranges and clarifies existing provisions without an intent to make technical changes. Therefore, no change in construction cost is anticipated if this proposal is approved.

WUIC30-24

WUIC31-24

IWUIC: 504.2

Proponents: Mark S. Graham, National Roofing Contractors Association (NRCA) (mgraham@nrca.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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*.

Reason: This code change proposal is intended to clarify the existing code and facilitate compliance and enforcement.

The designation "72-pound (32.4 kg)..." is proposed to be struck here as it is an outdated nominal designator for the product already designated product standard, ASTM D3909. ASTM D3909's Table 1-Dimensions and Masses of Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules," provides minimum average mass per roll and minimum mass per unit area of mineral granule-surfaced cap sheet. Products complying with ASTM D3909 are required to be labeled with the ASTM D3909 designation to assist in identifying the product and enforcement.

Identifying this product by its ASTM designation and not its outdated nominal designation has already been incorporated into Section 504.2.1-Roof Valleys, Section 505.2-Roof Assembly, Section 505.2.1-Roof Valleys, Section 506.2-Roof Assembly and Section 506.2.1-Roof Valleys.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal removes an outdated nominal product designator and does not increase or decrease the stringency of the code.

WUIC31-24

WUIC32-24

IWUIC: 504.2, 504.2.1, 505.2.1, 506.2.1

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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.

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.

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.

Reason: The provisions for roof valleys in sections 504.2.1, 505.2.1, and 506.2.1 were added into the 2009 IWUIC through action by the California Office of the State Fire Marshal (WUIC22-06/07, WUIC32-06/07, and WUIC45-06/07). The sections 504.2, 505.2, and 506.2 provisions for use of a D3909 product as an eave protection for roof coverings with a space between the roof covering and the roof deck were added into the 2009 IWUIC by the same proponent (WUIC21-06/07, WUIC31-06/07, and WUIC44-06/07). In all cases, the original proposals were modified by the Committee to change the description from "No. 72 ASTM cap sheet" to "72 pound (32.4 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909." It appears the intent of the Committee was to replace a generic description of an acceptable material with a reference to an ASTM standard specification. Unfortunately, the generic "No. 72" reference of the original proposal was transformed into a requirement for a "72-pound" product, which may conflict with the weight limits contained in ASTM D3909.

ASTM D3909 sets a minimum mass per unit area of the granule-surfaced product at 63.2 lbs/100 square feet. It further requires an average mass per roll of 68 lbs/108 square feet for products with a 2-inch selvage width, 69 lbs/108 square feet for products with no selvage, and 70 lbs/114 square feet for products with a 4-inch selvage. These requirements were in place when the standard was added in these sections of the 2009 IWUIC and remains the same in the current edition of D3909.

The IWUIC requirement that D3909 products used for either valley lining or eave protection be exactly 72 pounds resulted from the transformation of the original proponent's "No. 72" to "72-pound." The code development record provides no technical substantiation for the weight requirement in addition to D3909 compliance to function effectively as either a valley lining or an eave protection material. In fact, presence of the "72 pound" requirement makes compliance with these provisions unlikely if interpreted literally, since 72 pounds is established as an absolute value instead of a minimum or maximum.

During the cycle which generated the 2021 IWUIC, the Committee modified proposals WUIC11-18 and WUIC16-18 to strike the phrase "72 pound (32.4 kg) mineral-surfaced, nonperforated" from sections 505.2 and 506.2, respectively. During that cycle, there were no proposals which included sections 504.2, 504.2.1, 505.2.1, or 506.2.1, so the Committee had no opportunity to make the same change in those sections for D3909. This proposal provides an opportunity to remove the weight limit associated with use of D3909 product.

In addition to removing the prescription that acceptable D3909 products be exactly 72 pounds, this proposal removes the unnecessary descriptive language "mineral-surfaced, nonperforated" to align with the changes to 505.2 and 506.2 which were made in the prior cycle. Products which comply with D3909 are mineral-surfaced and are nonperforated.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal may be seen as not strictly editorial, since it removes an existing weight requirement that is in addition to compliance with ASTM D3909. The absence of an area associated with the current weight requirement makes a comparison of the effect of its removal on construction cost challenging. The expectation, based on review of several products present in the market, is that removal of the current weight provision will not cause significant changes in available products. No change in installation costs should occur.

WUIC32-24

WUIC33-24

IWUIC: 504.2, 505.2, 506.2, TABLE C101.1; IFC: 1207.9.5

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Wildland Urban Interface Code

Revise as follows:

504.2 Roof assembly.

Roofs shall have a *roof assembly* ~~that complies with a~~ classified as 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*.

505.2 Roof assembly.

Roofs shall have a *roof assembly* ~~that complies with not less than a~~ classified as 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*.

506.2 Roof assembly.

Roofs shall have a *roof assembly* ~~that complies with~~ classified as 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*.

TABLE C101.1 FIRE HAZARD SEVERITY FORM

A. Subdivision Design Points	
1. Ingress/Egress	
Two or more primary roads	1__
One road	3__
One-way road in, one-way road out	5__
2. Width of Primary Road	
20 feet (6096 mm) or more	1__
Less than 20 feet (6096 mm)	3__
3. Accessibility	
Road grade 5% or less	1__
Road grade more than 5%	3__

4. Secondary Road Terminus	
Loop roads, cul-de-sacs with an outside turning radius of 45 feet (13 716 mm) or greater	1__
Cul-de-sac turnaround	2__
Dead-end roads 200 feet (60 960 mm) or less in length	3__
Dead-end roads greater than 200 feet (60 960 mm) in length	5__
5. Street Signs	
Present	1__
Not present	3__
B. Vegetation (IWUIC Definitions)	
1. Fuel Types	
Light	1__
Medium	5__
Heavy	10__
2. Defensible Space	
70% or more of site	1__
30% or more, but less than 70% of site	10__
Less than 30% of site	20__
C. Topography	
8% or less	1__
More than 8%, but less than 20%	4__
20% or more, but less than 30%	7__
30% or more	10__
D. Roofing Material	
Class A Fire Classification <u>Rated</u>	1__
Class B Fire Classification <u>Rated</u>	5__
Class C Fire Classification <u>Rated</u>	10__
Nonrated	20__
E. Fire Protection—Water Source	
500 GPM (1892.5 L/min) hydrant within 1,000 feet (304.8 m)	1__
Hydrant farther than 1,000 feet (304.8 m) or draft site	2__
Water source 20 min. or less, round trip	5__
Water source farther than 20 min., and 45 min. or less, round trip	7__
Water source farther than 45 min., round trip	10__
F. Existing Building Construction Materials	
Noncombustible siding/deck	1__
Noncombustible siding/combustible deck	5__
Combustible siding and deck	10__

G. Utilities (gas and/or electric)	
All underground utilities	1__
One underground, one above ground	3__
All above ground	5__
Total for Subdivision	
Moderate Hazard	40-59
High Hazard	60-74
Extreme Hazard	75+

2024 International Fire Code

Revise as follows:

1207.9.5 Rooftop installations.

ESS and associated equipment that are located on rooftops and not enclosed by building construction shall comply with the following:

1. Stairway access to the roof for emergency response and fire department personnel shall be provided either through a bulkhead from the interior of the building or a stairway on the exterior of the building.
2. Service walkways at least 5 feet (1524 mm) in width shall be provided for service and emergency personnel from the point of access to the roof to the system.
3. ESS and associated equipment shall be located from the edge of the roof a distance equal to at least the height of the system, equipment or component but not less than 5 feet (1524 mm).
4. The roofing materials under and within 5 feet (1524 mm) horizontally from an ESS or associated equipment shall be noncombustible or shall ~~be have~~ a Class A roof assembly rating when tested in accordance with ASTM E108 or UL 790.
5. A Class I standpipe outlet shall be installed at an *approved* location on the roof level of the building or in the stairway bulkhead at the top level.
6. The ESS shall be the minimum of 10 feet (3048 mm) from the fire service access point on the rooftop. [material based on NFPA 855 (2023)]

Reason: ASTM E108 or UL 790 tests are performed on *roof assemblies* to establish a classification (Class A, B, or C) based on exposure to simulated fire sources originating outside the building. The outcome of the test is a classification of the roof assembly. In contrast, ASTM E119 or UL 263 tests evaluate the duration for which building elements contain a fire, retain their structural integrity, or exhibit both properties during a predetermined test exposure. The result of these tests is expressed as a *fire resistance rating*.

This proposal adjusts language in several sections to clarify the distinction between these important fire tests. Specifically, it corrects cases where E108 or UL 790 tests results are characterized as a "rating" by changing those instances to "classified" or "classification." In IFC Section 1207.9.5, proposed changes remove the description of E108/UL 790 test results as a rating and recognize that an E108/UL 790 fire classification is applicable to the *roof assembly* instead of the roof materials.

As a minor cleanup, the phrase "not less than" is removed from 505.2, because there are no E108/UL790 classifications greater than Class A.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This change corrects language used to describe ASTM E108 or UL 790 test results without making any technical change to existing language. No impact on cost of construction should occur.

WUIC34-24

IWUIC: 504.5, 505.5

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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.~~
- 5.4. Ignition-resistant building 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.

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.~~
- 5.4. Ignition-resistant building 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.

Reason: This proposal addresses the fact that Section 503.2 describes the requirements for “ignition resistant building materials”. Therefore, the important distinction for the requirements on exterior walls is whether the entire assembly (the exterior wall assembly) is addressed or just the exterior side (the exterior wall covering). Therefore, there are four categories of materials to be addressed, namely exterior wall assemblies (materials providing 1 hour fire resistance rating, approved noncombustible materials making up the entire exterior wall assembly, or heavy timber or log wall construction) and exterior wall coverings, as represented by ignition-resistant building materials on the exterior side. Note that the word “building” between “ignition-resistant” and “materials” is missing in comparison with the defined term (also used in Section 503.2).

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is an editorial cleanup. There are no changes in technical requirements.

WUIC35-24

IWUIC: 504.5, 504.5.1 (New), 504.5.1, ASTM Chapter 07 (New)

Proponents: William Koffel, Koffel Associates, Inc., Fire Safe North America (wkoffel@koffel.com)

2024 International Wildland Urban Interface Code

Revise as follows:

504.5 Exterior walls.

Exterior walls of buildings or structures shall be constructed of materials that comply with one or more 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.
6. Exterior wall coverings or exterior wall assemblies complying with Section 504.5.1

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

Add new text as follows:

504.5.1 Flame Propagation and Flame Impingement. Approved wall coverings or exterior wall assemblies that have been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 meeting the following conditions of acceptance:

1. No flame propagation to the top of the test specimen during the full duration of the test when tested with a modified flame exposure of 75 kW.
2. For exterior wall assemblies, no evidence of glowing combustion on the interior surface of the assembly during the full duration of the test.
3. For exterior wall assemblies, no evidence of flame penetration through the wall assembly during the full duration of the test.

Revise as follows:

504.5.12 Flashing.

A minimum of 6 inches (152 mm) of metal flashing or noncombustible material applied vertically on the exterior of the wall shall be installed at the ground, decking and roof intersections.

Add new standard(s) as follows:

ASTM

E2707-22

Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

Staff Analysis: A review of the standard proposed for inclusion in the code, ***Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure (ASTM E2707-22)***, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: During the last revision cycle, the additional option included in this proposal was proposed to be the mandatory requirement, with some exceptions that recognized the existing five methods. The Committee was not convinced that the existing five methods needed to be changed. Therefore, the flame propagation and flame impingement test approach is being proposed as an additional compliance approach.

The new performance option addresses the potential for flame propagation on an exterior wall. It recognizes the need to evaluate two separate and distinct aspects of fire safety pertaining to exterior walls. The proposed language maintains the provisions that address fire mitigating to the interior of an exterior wall, while adding language that addresses the tendency for flames to spread across the exterior of an exterior wall. The proposed test standard, ASTM E2707, was adopted by the California State Fire Marshal Standard 7A, Materials and Construction Methods for Exterior Wildfire Exposure, that is referenced in the California Building Code. A modified ASTM E2707 test is used to address flame propagation. Testing was conducted both in a 2011 research project conducted at UL, as well as in 2019 and 2020 as part of work being done through the ASTM Committee E05 on Fire Standards. Multiple assemblies have been successfully tested to date, including some with wood and vinyl siding. The UL research report is available at <https://fsri.org/research-update/wall-fire-experiments-examine-exterior-fire-spread-changes>

It should be noted that Subcommittee ASTM E05.14, External Fire Exposures, is working on a new standard test method to determine fire propagation of exterior wall assemblies using a direct flame. The proposal is consistent with the current draft of the new standard, including reducing the fire exposure from the 100 kW that was proposed last cycle to 75kW. If the new standard is completed in time, it is our intent to revise the proposed language to reference the new ASTM standard.

Bibliography: <https://fsri.org/research-update/wall-fire-experiments-examine-exterior-fire-spread-changes>

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal provides an additional compliance option without changing or deleting the existing compliance option.

WUIC35-24

WUIC36-24

IWUIC: SECTION 202 (New), 504.5, 504.5.1 (New), 504.5.2 (New), 504.5.1

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Add new definition as follows:

EXTERIOR SURFACES. Weather-exposed surfaces.

EXTERIOR WALL. A wall, bearing or nonbearing, that is used as an enclosing wall for a building, other than a fire wall, and that has a slope of 60 degrees (1.05 rad) or greater with the horizontal plane.

Revise as follows:

504.5 Exterior walls.

Where defensible space conforms to the provisions of Section 603, exterior walls of buildings or structures shall be constructed in accordance with Section 504.5.1 or Section 504.5.2.

Where defensible space does not conform to the provisions of Section 603, exterior walls of buildings or structures shall be constructed in accordance with Section 504.5.1 and Section 504.5.2.

Flashing shall be applied in accordance with Section 504.5.3, 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.

Add new text as follows:

504.5.1 Exterior wall assemblies. Exterior wall assemblies of buildings or structures shall have a minimum of 1-hour fire-resistance-rating, rated for exposure on the exterior side in accordance with Section 501.3.

The exposed bottom edge of combustible sheathing shall be protected with noncombustible building material with a minimum assigned protection time of 40 minutes, or the sheathing shall be inset to rest directly on the foundation.

Exception: The bottom edge of exposed combustible sheathing is permitted to be covered with corrosion-resistant metal flashing provided there is an air gap of at least 1 inch between the metal flashing and the bottom edge of the combustible sheathing. Both legs of the flashing shall be attached a maximum of 6 inches (152.4 mm) on center.

504.5.2 Exterior surfaces. The exterior surfaces shall be constructed in accordance with one or more of the followings:

1. Approved noncombustible materials complying with Section 503.2.1.
2. Fire-retardant-treated wood complying with Section 503.2.2.

3. Ignition-resistant building materials complying with Section 503.2.4.

Revise as follows:

~~504.5.1~~ 504.5.3 Flashing.

A minimum of 6 inches (152 mm) of metal flashing or noncombustible material applied vertically on the exterior of the wall shall be installed at the ground, decking and roof intersections.

Reason: Table 503.1 requires the use of Ignition Resistant Construction Class 1 (IR1) in situations where defensible space is nonconforming. In such scenarios during a wildfire, the exterior walls of the structure may be exposed to embers, radiation heat, and direct flame exposures. Accordingly, the exterior wall assembly needs to provide a minimum resistance against these exposures. Intermediate-scale, and full-scale experiments performed at the IBHS Research Center illustrate that the current requirements do not provide the needed resistance against wildfire exposures. Section 504.5 provides 5 alternatives for construction of exterior walls:

1. Materials approved for not less than 1-hour fire-resistance-rated (FRR) 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. According to section 503.2 ignition-resistant materials include the followings: noncombustible, FRTW and IR building materials.

There is a notable inconsistency in the current alternatives for exterior walls of this class of construction, particularly in terms of resistance against fire impingement and flame spread. The first method permits 1-hour FRR construction when tested in accordance with ASTM E119 or UL 263. In this test the wall assembly is tested without a siding material, and it is possible to have 1-hour FRR wall assembly with different combustible siding materials and different rates of flame spread on the exterior surface. Therefore, there is significant risk of fire spreading to other sections of the building, including eaves, roofs, and openings (vents, windows, doors), with less restrictive fire resistance requirements. Figure 1 displays a moment captured during the wind-driven fire spread tests conducted at the IBHS research center at the separation distance of 20 ft. The "source structure" comprises metal and wooden sheds containing 15, 6-A wood cribs (UL 711 standard cribs). The "target structure" is a one-and-a-half-story residential structure featuring an open eave, double-pane tempered windows, and a one-hour-rated exterior wall. The cladding consists of a combination of combustible engineered wood siding material on left side and fiber cement panels on the right. Both structures face a nominal wind speed of 35 mph, and the thermal impact on the target building is observed using heat flux gauges, thermocouples, and cameras. As can be seen in Figure 1, about 10 minutes after a point ignition inside the shed, the target building ignited and within the next few seconds, the fire could spread on the surface causing severing damage to the eaves, vents, and windows. The test was terminated after a minute due to safety reasons. In this test the target structure had 1-hr FRR from exterior. The dark gray siding was fiber cement board (noncombustible siding) while the light gray siding was engineered wood (combustible) siding material.



Figure 1. a. The test setup for wind driven building to building fire spread tests. The target building has an hour fire resistant rated wall assembly.



Figure 1. b. ignition of the combustible siding.



Figure 1. c. fire spread on the surface and flames touching all components in about 10 seconds on left side.



Figure 1. d. after suppression; severe damage can be seen on all components on the left-side.

Another concern with 1-hour FRR alone is the wide range of wall assemblies that can meet the performance requirements of ASTM E119. Figure 2 shows two different wall assemblies that achieve 1-hr FRR from either side.

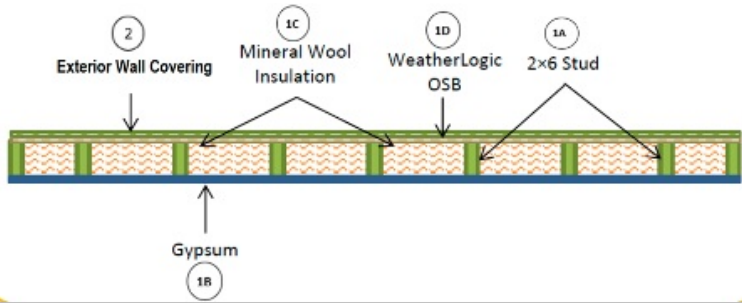


Figure 2. a. 1-hour fire resistance rated exterior wall with OSB sheathing panel on the exterior side [1].

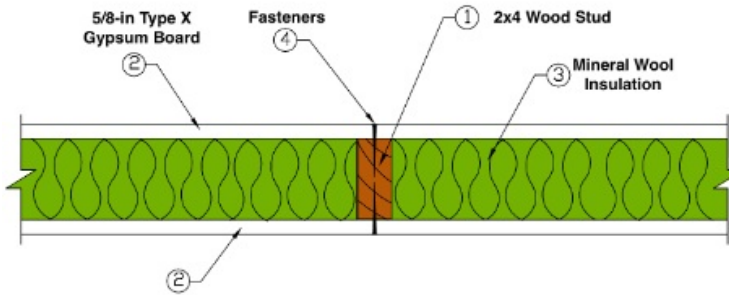


Figure 2. b. 1-hour fire resistance rated exterior wall with Type X gypsum board on the exterior side [2].

While Figure 2a and 2b both qualify as 1-hr FRR construction, the assembly in Figure 2a is particularly vulnerable to wildfire exposure at the base because combustible sheathing material is used in the assembly. Figure 3 shows a series of fire tests conducted at the IBHS Research Center where different configurations of 1-hour fire-resistant rated assembly with combustible engineered wood siding material were exposed to a small fire at the base. Figure 3a is about a typical 1-hour fire-resistant rated assembly constructed with OSB sheathing material. In this test the OSB sheathing material is exposed from bottom. During this experiment, the fire spread across the surface of the combustible exterior siding and impinged inside the wall cavity because of the exposed bottom surface of OSB sheathing material. Figure 3b shows a 1-hour fire-resistant rated assembly constructed with noncombustible sheathing material in accordance with Figure 2b. In this experiment the fire only ignited the combustible engineered wood siding material and did not impinge inside the wall assembly.





Figure 3. a. 1-hr FRR assembly with unprotected OSB Sheathing material at the bas3. Photo curtesy by Milad Shabani, IBHS.



Figure 3. b. 1-hr FRR assembly with noncombustible sheathing material. Photo courtesy by Milad Shabanian, IBHS.

Item 2 of Section 504.5 permits the use of noncombustible materials. While this construction method provides comprehensive protection against fire spread, it does not specifically address the fire resistance rating and protection against fire impingement. Item 3 permits the use of heavy timber or log wall construction suggesting they offer similar protection. However, Section 602.4.4 in the IBC requires exterior walls of heavy timber construction to be noncombustible, which arguably aligns more appropriately with Item 2 or constructed

with FRTW or cross-laminated timber. In case that the exterior walls constructed with cross-laminated timber and heavy timber elements the exterior surface of such element shall be protected with: FRTW, Gypsum board or noncombustible materials.

In contrast, log wall construction technically aligns more with Item 1. According to Section 303 of ICC 400, 6-inch-thick logs can provide a 1-hour fire resistance against fire impingement. However, given their combustible nature, log wall constructions may exhibit varying fire spread rates, influenced by the different flame spread indices associated with various wood species.

Items 4 and 5 do not explicitly address fire impingement. These methods are only intended to limit the flame spread index of exterior surfaces. Figure 4 illustrates two typical exterior wall assembly constructed with ignition-resistant building material. Figure 4a is a typical exterior wall assembly protected on the exterior with noncombustible metal siding and Figure 4b is a wall protected with noncombustible fiber cement lap siding material.



Figure 4. a. Typical exterior wall assemblies constructed on the exterior with noncombustible metal siding. Photo courtesy by Milad

Shabanian, IBHS.



Figure 4. b. Typical exterior wall assemblies constructed on the exterior with noncombustible fiber cement siding material. Photo courtesy by Milad Shabanian, IBHS.

An additional inconsistency in the IWUIC is that requirements for exterior wall construction are the same for IR1 and IR2. This is clearly a discrepancy as IR1 construction is required in conditions more severe than those requiring IR2 construction in Table 503.1.

This proposed code change will increase the level of fire protection and provide a more logical and consistent level of performance for exterior wall assemblies against fire impingement and flame spread for IR1 where defensible space is nonconforming by:

- Requiring a minimum of 1 hr. fire resistance rating for all exterior wall assemblies to address fire impingement, and,
- Limiting the flame spread index of exterior siding materials to address flame spread to other areas of the building.

Note: IBC is the source of all suggested definitions.

Bibliography:

1. INTERTEK DIRECTORY OF BUILDING PRODUCTS, Louisiana-Pacific - LP WeatherLogic® Air & Water Barrier Fire Performance, https://bpdirectory.intertek.com/pages/DLP_SearchDetail.aspx?SpecID=67818
2. Design for code acceptance 3, American Wood Council, Fire-resistance-rated wood-frame wall and floor/ceiling assemblies. https://awc.org/wp-content/uploads/2021/12/awc-dca3_20210209_awcwebsite.pdf

Cost Impact: Increase

Estimated Immediate Cost Impact:

This modification to the code will raise construction costs by introducing two stipulations for exterior walls.

Estimated Immediate Cost Impact Justification (methodology and variables):

The existing code mandates that exterior walls should be built with either a one-hour fire-resistant rated assembly or an ignition-resistant exterior surface. In contrast, the proposed amendment will necessitate exterior walls to be constructed with both a one-hour fire-resistant rated assembly and an ignition-resistant exterior surface where provisions of Section 603 (defensible space requirement) are not met.

WUIC37-24

IWUIC: 504.6

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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:

1. Where defensible space conforms to the provisions of Section 603, complete enclosure shall not be required where the underside of exposed floors and exposed structural columns, beams and supporting walls are constructed with one of the following: 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.
 - 1.1. Exterior 1-hour fire-resistance-rated construction.
 - 1.2. Noncombustible material.
 - 1.3. Heavy timber or log wall construction.
 - 1.4. Fire-retardant treated wood labeled for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
 - 1.5. Ignition-resistant building material on the exterior surface.
2. Where defensible space does not conform to the provisions of Section 603, 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 in accordance with Section 501.3 and the exterior surfaces of these assemblies are constructed with one of the following materials:
 - 2.1. Noncombustible material complying with Section 503.2.1
 - 2.2. Fire-retardant-treated wood complying with Section 503.2.2
 - 2.3. Ignition-resistant building materials complying with Section 503.2.4.

Reason: Table 503.1 requires the use of Ignition Resistant Construction Class 1 (IR1) in situations where defensible space is nonconforming. In such conditions, the structure may be exposed to embers, radiation heat, and direct flame contact during a wildfire. Accordingly, the underfloor area of the building needs to provide a minimum resistance against these exposures.

Currently, the exception in section 504.6 provides 3 alternatives for constructing the unenclosed underfloor areas of buildings:

1. Materials approved for not less than 1-hour fire-resistance-rated (FRR) construction on the exterior side.
2. Heavy timber construction
3. Fire-retardant treated wood.

These methods do not provide protection from flame spread during a wildfire. This proposal addresses this issue by creating two exceptions addressing conditions with nonconforming defensible space and conditions with conforming defensible space.

For the nonconforming defensible space condition, this proposal requires the underside of exposed floors and exposed structural columns, beams and supporting walls to be protected with 1-hour fire-resistant-rated construction and also protected on the exterior

surfaces by ignition-resistant building materials complying with Section 503.2. This would provide protection from flame impingement and reduce rate of flame spread in areas where defensible space is nonconforming.

For the confirming defensible space condition, this proposal permits the use of the currently specified materials but expands the options to include noncombustible construction, log wall construction, and ignition resistant building materials on the exterior surface consistent with construction methods permitted by other areas in Section 504.

An additional inconsistency is that requirements for underfloor areas in the IWUIC are the same for IR1 and IR2. This is clearly a discrepancy as IR1 construction is required in conditions more severe than those requiring IR2 construction in Table 503.1. This proposed code change will increase the level of fire protection and provide a more logical and consistent level of performance for underfloor areas against fire impingement and flame spread for IR1 where defensible space is nonconforming by:

- Requiring a minimum of 1 hr. fire resistance rating to address fire impingement, and,
- Limiting the flame spread index of exterior surfaces to address flame spread to other areas of the building.

Cost Impact: Increase

Estimated Immediate Cost Impact:

\$0 or more. This code change proposal may increase the construction cost only where the underfloor area height is enough to be usable and 1-hour rated columns or walls covered on the exterior with combustible materials having a flame spread index more than 25 when tested in accordance with ASTM E84 (Figure 1). In such a case, the siding material will need to be removed or replaced with an ignition-resistant building material (noncombustible, FRTW, IR material) having a flame spread index less than 25.

Estimated Immediate Cost Impact Justification (methodology and variables):



Figure 1. Usable unenclosed underfloor areas.

WUIC38-24

IWUIC: 504.6, 505.6, 506.3

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org); Jason Smart, American Wood Council (jsmart@awc.org)

2024 International Wildland Urban Interface Code

Revise as follows:

504.6 Underfloor enclosure.

~~Buildings or structures shall have underfloor~~ Underfloor areas of buildings and structures shall be 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.

505.6 Underfloor enclosure.

~~Buildings or structures shall have underfloor~~ Underfloor areas of buildings and structures shall be 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.

506.3 Underfloor enclosure.

~~Buildings or structures shall have underfloor~~ Underfloor areas of buildings and structures shall be 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.

Reason: Current provisions in Sections 504.6, 505.6 and 506.3 could be interpreted as requiring all buildings or structures to have underfloor areas. Many buildings and structures, such as those with slab-on-grade foundations or basements, do not have underfloor areas, nor should they be required to. This proposal clarifies that the provisions of Sections 504.6, 505.6 and 506.3 only apply where underfloor areas exist.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is a simple clarification of existing provisions. See also the proponent's reason statement.

WUIC38-24

WUIC39-24

IWUIC: 504.6, 505.5.1 (New), 505.6, 506.3 (New), 506.3, 504.5.1

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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. A minimum of 6 inches of noncombustible material or metal flashing extending vertically from grade is required on the exterior of columns and walls.

Add new text as follows:

505.5.1 Flashing. A minimum of 6 inches of noncombustible material or metal flashing extending vertically is required on the exterior of the wall at the ground, decking and roof intersections.

Revise as follows:

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. A minimum of 6 inches of noncombustible material or metal flashing extending vertically from grade is required on the exterior of columns and walls.

Add new text as follows:

506.3 Exterior walls. A minimum of 6 inches of noncombustible material or metal flashing extending vertically is required on the exterior of the wall at the ground, decking and roof intersections.

Revise as follows:

~~506.3~~ **506.4 Underfloor enclosure.**

Buildings or structures shall have underfloor areas enclosed to the ground with exterior walls in accordance with Section 506.3.

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. A minimum of 6 inches of noncombustible material or metal flashing extending vertically from grade is required on the exterior of columns and walls.

504.5.1 Flashing.

A minimum of 6 inches (152 mm) of ~~metal flashing or noncombustible material or metal flashing extending applied~~ metal flashing or noncombustible material or metal flashing extending applied vertically is required on the exterior of the wall ~~shall be installed~~ at the ground, decking and roof intersections.

Reason: In the 2024 IWUIC, a new section was added to Class 1 ignition resistant construction (IR1) that requires a minimum of 6 inches of metal flashing or noncombustible material applied vertically on the exterior of the wall at the ground, decking and roof intersections. In a wildfire event, buildings are threatened by at least one of the three fundamental wildfire exposures: embers, radiant heat, or direct flame contact. Of these exposures, ember exposure stands out as a prevalent cause of building ignition. Embers, propelled for miles by the wind, can penetrate small openings and accumulate around buildings, particularly where combustible debris is also

present (Figure1).



Figure 1. 6-in noncombustible vertical clearance worked as fuel break at the base of exterior walls in Lahaina wildfire. Photo credit: Steve Hawks, IBHS.

Therefore, this proposal will add protection against embers for all structures in wildfire-prone areas by expanding ember protection requirements in IR1 and adding ember protection for IR2 and IR3. Figure 2 shows a 6-in noncombustible vertical clearance at the base of exterior walls and underfloor columns.



Figure 2. 6-in Noncombustible vertical clearance at the base of exterior walls and underfloor area columns: a. Lahaina Fire 2023 (Photo curtesy Milad Shabanian, IBHS), b. Glass Fire 2020 (Photo curtesy Steve Hawks, IBHS).

The objective of this proposal is to enhance the resilience of buildings in wildfire-prone regions against embers by requiring a 6-inch noncombustible vertical clearance on exterior walls for all ignition resistant construction classes where they intersect with horizontal surfaces such as the ground, decks, and roof assemblies.

This code change intends to improve the protection of a vertical surface where the vertical surface intersects with a horizontal surface. The intersection of a vertical and horizontal surface is a known area where debris tends to accumulate and where embers tend to accumulate during a wildfire. The combination of accumulated debris and embers can ignite the debris, enabling the fire to spread to the vertical surface. The first part of this proposal adds a minimum 6 inches of noncombustible flashing on the exterior walls of Ignition-Resistant Class 2 and 3 constructions at points where exterior walls intersect with horizontal surfaces. The remainder of this proposal extends an equivalent level of ember-resistance to exposed columns and vertical members within unenclosed underfloor areas across all three classes of ignition-resistant construction.

Section 504.5.1 is proposed to be revised to match the language proposed for Sections 504.6, 505.5.1, 505.6, 506.3 and 506.4 and to

provide some clarity. As currently written, Section 504.5.1 could be interpreted to require metal flashing or noncombustible materials on a noncombustible wall such as a concrete or masonry wall. This clearly was not the intent of the original language. The revised language is intended to clarify this.

Cost Impact: Increase

Estimated Immediate Cost Impact:

This code change may increase the construction cost only where the exterior walls intersect with unenclosed projections such as attached decks, balconies, and roofs such as dormers.

Estimated Immediate Cost Impact Justification (methodology and variables):

The noncombustible flashing that needs to be installed instead of exterior siding material in these cases may be cheaper or more expensive than the siding material considering the range of flashing products available in the market. But in general the cost increase will not be significant. A review of common retailers websites indicates that the cost of 6 inch wide metal flashing varies according to the quantity purchased. Galvanized steel metal flashing that is 6 inches wide costs approximately \$24.24 for a 50 foot length. This is approximately \$0.48 per foot of material. Labor and fastener costs are estimated to be minimal.

WUIC39-24

WUIC40-24

IWUIC: 504.6, 505.6, 506.3

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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, constructed with one of the following:

1. Exterior 1-hour fire-resistance-rated construction.
2. Noncombustible material.
3. Heavy timber or log wall construction.
4. Fire-retardant treated wood labeled for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.
5. Ignition-resistant building material on the exterior surface.

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, constructed with one of the following:

1. Exterior 1-hour fire-resistance-rated construction.
2. Noncombustible material.
3. Heavy timber or log wall construction.
4. Fire-retardant treated wood labeled for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.
5. Ignition-resistant building material on the exterior surface.

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, constructed with one of the following:

1. Exterior 1-hour fire-resistance-rated construction.
2. Noncombustible material.
3. Heavy timber or log wall construction.

4. Fire-retardant treated wood labeled for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.
5. Ignition-resistant building material on the exterior surface.

Reason: This code change proposal intends to address the gaps in the exception for open underfloor areas for all three ignition-resistant construction classes. Currently, the exception to complete enclosure only permits the use of a 1-hour fire-resistance-rated construction, heavy timber construction, and fire-retardant-treated wood. However, it is very common to use noncombustible columns and beams for underfloor areas. Considering the fire performance of noncombustible materials in comparison to the other permitted types of construction, noncombustible materials should be added to the exception. Figure 1 shows two examples of an unenclosed underfloor area constructed with noncombustible materials. Ignition-resistant building materials are also proposed to be added as an option consistent with fire-retardant-treated wood which is currently permitted.



Figure 1. Noncombustible unenclosed underfloor areas.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change intends to address the alternatives missed in current code language for underfloor areas. This code change provides more alternatives for unenclosed underfloor areas and therefore will not increase the construction cost.

WUIC41-24

IWUIC: 504.7, 505.7

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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

1. Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side.
2. Approved noncombustible materials.
- 2.3. ~~Fire-retardant treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.~~ Heavy timber or log wall construction.
- 3.4. ~~Ignition-resistant building materials complying in accordance with Section 503.2 on the exterior side.~~

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

505.7 ~~Appendages and projections~~ Attachments.

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 with ~~of~~ one of the following methods, ~~except that coated materials shall not be used as the walking surface of decks::~~

1. Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side.
2. Approved noncombustible materials.
- 2.3. ~~Fire-retardant treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.~~ Heavy timber or log wall construction.
- 3.4. ~~Ignition-resistant building materials complying in accordance with Section 503.2 on the exterior side.~~

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

Reason: This proposal is an editorial cleanup. There are no technical change in requirements.

This proposal addresses the fact that section 503.2 describes the requirements for “ignition resistant building materials”. Therefore, the important distinction for the requirements on attachments (including appendages, projections, and decks) is whether the entire assembly (the exterior assembly) is addressed or just the exterior side (the exterior covering). Therefore, there are four categories of materials to be addressed, namely exterior assemblies for the attachments (materials providing 1 hour fire resistance rating, approved noncombustible materials making up the entire exterior assembly, or heavy timber or log wall construction) and exterior coverings, as represented by ignition-resistant building materials, complying with Section 503.2, on the exterior side.

The title is being changed from “Appendages and projections” to “Attachments”. Also, the prohibition for using coated materials on the walking surface of decks is being moved from an exception into the charging paragraph.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is a simple clarification of existing requirements and has no effect on cost.

WUIC41-24

WUIC42-24

IWUIC: 504.7, 505.7

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org); Jason Smart, American Wood Council (jsmart@awc.org)

2024 International Wildland Urban Interface Code

Revise as follows:

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. 1-hour fire-resistance-rated construction.
2. Heavy timber construction.
- ~~3.~~ Approved noncombustible materials.
- ~~4.~~ Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
- ~~5.~~ Ignition-resistant building materials in accordance with Section 503.2.

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

6. Any materials permitted by code where all exterior walls to which the *unenclosed accessory structure* is attached have a 1-hour fire-resistance rating, rated for exposure to fire from the exterior side, and have ignition-resistant materials complying with Section 503.2 on the exterior side.

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. 1-hour fire-resistance-rated construction.
2. Heavy timber construction.
- ~~3.~~ Approved noncombustible materials.
- ~~4.~~ Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
- ~~5.~~ Ignition-resistant building materials in accordance with Section 503.2.

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

6. Any materials permitted by code where all exterior walls to which the *unenclosed accessory structure* is attached have a 1-hour fire-resistance rating, rated for exposure to fire from the exterior side, and have ignition-resistant materials complying with Section 503.2 on the exterior side.

Reason: The two options currently listed in the charging language of Sections 504.7 and 505.7 for appendages and projections are moved down into the existing list of other options. An additional option is added to the requirements for unenclosed accessory structures, such as decks, in Class 1 and Class 2 ignition-resistant construction. This additional option allows for unenclosed accessory structures to be constructed of any materials permitted by code where the exterior walls, to which the unenclosed accessory structures are attached, comply with enhanced fire protection requirements. These enhanced fire protection requirements for exterior walls require both a 1-hour fire-resistance rating and use of ignition-resistant materials on the exterior side. These requirements are more stringent than current exterior wall requirements in Class 1 ignition-resistant construction, which is permitted to be used where defensible space provisions of Section 603 are not met. This option for enhanced protection of the adjacent exterior walls will help prevent entry of fire into the building in the event of ignition of the unenclosed accessory structure, such as decks.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

\$0 or less. There could be a cost decrease for some buildings.

Estimated Immediate Cost Impact Justification (methodology and variables):

The proposal provides one additional option for compliance (Item 6). This new option allows for more cost-effective deck construction in cases where exterior walls meet enhanced fire protection requirements. The other existing provisions and options currently allowed in 504.7 and 505.7 remain functionally unchanged.

WUIC42-24

WUIC43-24

IWUIC: 504.7, 505.7

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

504.7 Appendages and projections.

~~Unenclosed accessory structures and projections, such as decks, balconies, porches, and stairs~~ 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~~with one of the following:

1. Not less than 1-hour fire-resistance-rated construction on the exterior side.
- ~~2.~~ *Approved noncombustible materials.*
3. Heavy timber construction.
- ~~4.~~ Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
- ~~5.~~ 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 Appendages and projections.

~~Unenclosed accessory structures and projections, such as decks, balconies, porches, and stairs~~ 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~~with one of the following:

1. Not less than 1-hour fire-resistance-rated construction on the exterior side.
- ~~2.~~ *Approved noncombustible materials.*
3. Heavy timber construction.
- ~~4.~~ Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the International Building Code.
- ~~5.~~ Ignition-resistant building materials in accordance with Section 503.2.

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

Reason: This primary intent of this proposal is to provide clarity to the criteria for appendages and projections. Sections 504.7 and 505.7 are proposed to be reorganized by relocating the allowable construction methods to a numbered list which is a similar format to other sections in the IWUIC. Additionally, Chapter 2 defines unenclosed accessory structures as "an accessory structure without a complete exterior wall system enclosing the area under roof or floor above. The IWUIC commentary also states that "this definition refers to structures without walls, or without walls on all sides. Most commonly, this would include a deck or platform." Balconies, porches and stairs are also other platforms that should be listed to provide clarity around construction of these attached structures. For example, in post-event investigations performed by IBHS, it is clear that stairs constructed of inappropriate materials that are attached to a building are at risk of ignition and need to be included in the list of examples in Sections 504.7 and 505.7. Figure 1 provides an example of a nonconforming attached stair ignited by surrounding fuel sources. The intent of this proposal is to make clear that all attached accessory structures, including stairs, proches and balconies, are required to be constructed in accordance with the requirements of IWUIC.



Figure 1. Nonconforming attached accessory structure (stair). Photo by Milad Shabaniyan, IBHS.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change proposal does not result in technical changes to the code and will not impact construction costs.

WUIC44-24

IWUIC: 504.7.1, 505.7.1, 506.6 (New), 506.6.1 (New)

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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.~~

Unenclosed accessory structures and projections attached to buildings with habitable spaces shall have underfloor areas enclosed to the ground with exterior wall construction 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 constructed in accordance with Section 504.7 and a minimum of 6 inches of metal flashing or noncombustible material applied vertically on the exterior of the vertically aligned structural elements such as columns and supporting walls at the ground.

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.~~

Unenclosed accessory structures and projections attached to buildings with habitable spaces shall have underfloor areas enclosed to the ground with one of the following methods:

1. Exterior wall construction in accordance with Section 505.5.
2. Noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm).

Exception: Complete enclosure shall not be required where the underside of exposed floors and exposed structural columns, beams and supporting walls are constructed in accordance with Section 505.7 and a minimum of 6 inches of metal flashing or noncombustible material applied vertically on the exterior of the vertically aligned structural elements such as columns and supporting walls at the ground.

Add new text as follows:

506.6 Appendages and projections. The underfloor areas of unenclosed accessory structures and projections, such as decks, balconies, porches, and stairs attached to buildings with habitable spaces shall be constructed in accordance with Section 506.6.1

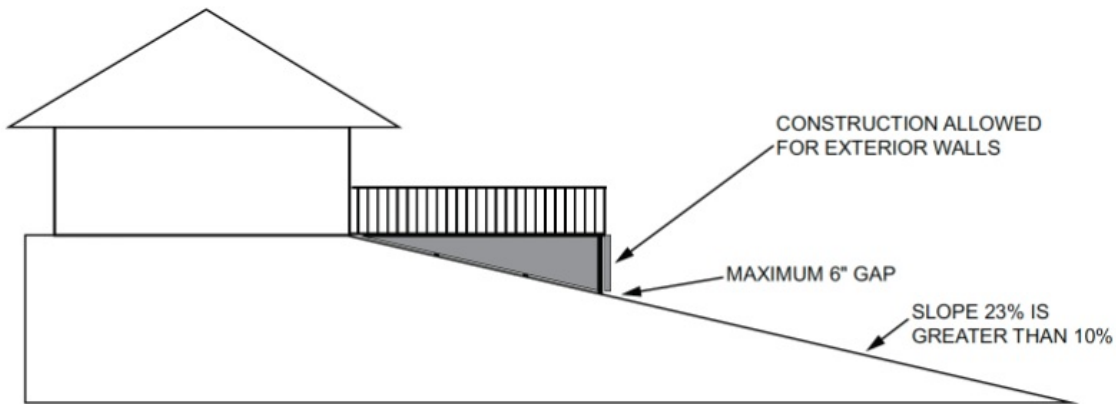
506.6.1 Underfloor areas. Unenclosed accessory structures and projections attached to buildings with habitable spaces shall have underfloor areas enclosed to the ground with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm).

Exception: Complete enclosure shall not be required where a minimum of 6 inches of metal flashing or noncombustible material applied vertically on the exterior of columns and supporting walls at the ground.

Reason: Figure 1 clarifies the intention of sections 504.7.1 and 505.7.1. There are 4 concerns surrounding the current requirements of the IWUIC regarding the construction of an underfloor area of attached accessory structures.

First, there is no scientific reason to support the slope limitations provided in these sections. All structures, their attached accessory structures, detached accessory structures and their underfloor areas are exposed to at least one of the wildfire exposures. As it is well studied, wildfires can threaten buildings through three different exposures: embers, radiation heat, and direct flame contact. Excluding

the underfloor area of attached accessory structures located on a surface with a slope less than 10 percent will result in excluding many balconies, decks, stairs, and other attached accessory structures constructed on flat surfaces. The code requirements should not differentiate between underfloor areas of building and attached structures. This is also against the requirements provided in the California Building Code (Chapter 7A, Section 707.9A).



**Commentary Figure 504.7.1
PROTECTION UNDER DECK ON A SLOPE**

Figure 1. 6-in gap at the ground level (IWUIC Commentary).

Second, technical concerns around having a 6-in opening at the base of walls. Currently, the code requires the underfloor areas of attached accessory structures to be fully enclosed to within 6 inches (152 mm) of the ground (Figure 1). The 6-in opening seems to be required for water irrigation purposes. However, this requirement does not align well with provided construction methods for attached accessory structures.

According to sections 504.7 and 505.7, appendages and projections shall be constructed with one of the following alternatives:

1. 1-hour fire-resistant construction.
2. Heavy timber construction.
3. Approved noncombustible materials.
4. Fire-retardant-treated wood.
5. Ignition-resistant building materials in accordance with section 503.2.

In a 1-hour fire-resistant floor assembly, the fire shall not pass the floor assembly for at least 1 hour during ASTM E119 or UL 263 fire test. Consequently, water intrusion through the floor system is not possible.

In heavy timber construction, based on the definition (Figure 2) from IBC, “the exterior walls are of noncombustible materials” with some exceptions.

602.4.4 Type IV-HT. Type IV-HT (Heavy Timber) construction is that type of construction in which **the exterior walls are of noncombustible materials** and the interior building elements are of solid wood, laminated heavy timber or structural composite lumber (SCL), without concealed spaces or with concealed spaces complying with Section 602.4.4.3. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, SCL and cross-laminated timber (CLT) and the details of Type IV construction shall comply with the provisions of this section and Section 2304.11. **Exterior walls complying with Section 602.4.4.1 or 602.4.4.2 shall be permitted.** Interior walls and partitions not less than 1- hour fire-resistance rated or heavy timber conforming with Section 2304.11.2.2 shall be permitted.

Figure 2. IBC requirements for Heavy Timber (HT) construction.

Figure 3 provides examples of attached accessory structure constructed with noncombustible materials. It is evident that building a noncombustible attached accessory structure with maximum 6-in gap at the base is unnecessary and impractical in many cases. IWUIC provides an exception for underfloor areas of buildings and detached accessory structures while missing a similar requirement for attached accessory structures. In many instances such as examples provided in Figure 3, attached accessory structures are required to have unenclosed underfloor areas and having an exception is unavoidable.



Figure 3. Unenclosed and enclosed attached accessory structure nonconforming with current requirements.

In addition, there is a safety concern about having a 6-in gap at the base during a wildfire. Combustible debris and embers can both collect in corners and around the building where exterior walls intersect with horizontal surfaces (Figure 4). IBHS research shows that protecting these areas with noncombustible materials can protect the building from ignitions caused by embers. Leaving a gap at the base of exterior walls of attached accessory structures will increase the chance of combustible debris and ember accumulation under the deck area.



Figure 4. Ember accumulation around a building, IBHS Research Center.

Finally, the IWUC provides identical requirements for construction of underfloor areas of attached accessory structures in IR1 and IR2. On the other hand, the IWUC does not address this known vulnerability in IR3. All buildings located in wildfire prone areas need to be always protected against ember exposure.

This code change proposal intends to address these concerns by revising the requirements in sections 504.7.1 and 505.7.1 and adding a new section for IR3.

Section 504.7.1 revised to:

- Eliminate the slope limitation.
- Eliminate the 6-in opening at the base.
- Add exception for unenclosed underfloor areas.
- Add a 6-in noncombustible flashing requirement to columns and walls of unenclosed underfloor areas.

Section 505.7.1 revised to:

- Eliminate the slope limitation.
- Eliminate the 6-in gap at the base.
- Provide additional alternative (1/8-in noncombustible mesh) for protection of underfloor areas to make it less restrictive than IR Class 1.
- Add exception for unenclosed underfloor areas.
- Add a 6-in noncombustible flashing requirement to columns and walls of unenclosed underfloor areas.

New section added to IR Class 3 to:

- Add a 1/8-in noncombustible screen mesh protection for underfloor areas to make it ember-resistant with less restrictive requirements than IR Class 1 and 2.
- Add exception for unenclosed underfloor areas.
- Add a 6-in noncombustible flashing requirement to columns and walls of unenclosed underfloor areas to make unenclosed underfloor areas ember-resistant.

Cost Impact: Increase

Estimated Immediate Cost Impact:

This code change proposal will increase the construction cost where it expands the scope of these sections through eliminating the limitation of the ground slope. However, the code change will reduce construction costs by proposing exceptions for unenclosed underfloor areas. It will also increase the construction cost in IR Class 3 construction where the code change will mandate additional requirements for protecting underfloor areas with 1/8-in noncombustible mesh screen or 6-in metal flashing.

Estimated Immediate Cost Impact Justification (methodology and variables):

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WUIC44-24

WUIC45-24

IWUIC: 504.9, 504.9.1 (New), 505.9, 505.9.1 (New), 506.9 (New), 506.9.1 (New)

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

504.9 Exterior doors.

Exterior doors shall be *approved noncombustible* construction, solid-core wood not less than 1³/₄ inches thick (44 mm) and protected with a minimum 6-inch noncombustible material, such as a kick plate, applied at the base on the exterior of the door, 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~~ **Exceptions:** ~~Vehicle access doors.~~

1. Vehicle access doors.
2. The 6 inches of noncombustible material at the base is not required for solid-core wood doors not less than 1³/₄ inches thick (44 mm) protected by an approved noncombustible door such as a storm door.

Add new text as follows:

504.9.1 Exterior underfloor access doors. Exterior underfloor access doors shall be constructed with noncombustible material or a minimum of 6-in noncombustible material that extends vertically from the base.

Revise as follows:

505.9 Exterior doors.

Exterior doors shall be *approved noncombustible* construction, solid core wood not less than 1³/₄ inches thick (45 mm) and protected with a minimum 6-inch noncombustible material such as a kick plate at the base on the exterior of door, 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~~ **Exceptions:** ~~Vehicle access doors.~~

1. Vehicle access doors.
2. The 6 inches of noncombustible material at the base is not required for solid-core wood door not less than 1³/₄ inches thick (44 mm) protected by an approved noncombustible door such as a storm door.

Add new text as follows:

505.9.1 Exterior underfloor access doors. Exterior underfloor access doors shall be constructed with noncombustible material or a minimum 6-in noncombustible material that extends vertically at the base.

506.9 Exterior doors. Exterior doors shall be protected with a minimum 6-inch noncombustible material at the base on the exterior of the door.

Exceptions:

1. Vehicle access doors.
2. Exterior doors protected by an approved noncombustible door such as a storm door.

506.9.1 Exterior underfloor access doors. Exterior underfloor access doors shall be constructed with noncombustible material or a minimum 6-in noncombustible material that extends vertically at the base.

Reason: Like other parts of the building envelope, exterior doors can be exposed to flames, radiant heat, and embers. NIST's Waldo Canyon Fire (2012) post-investigation in El Paso County, Colorado, reports doors as a frequent damaged component of the building [1]. Maintaining a proper defensible space around the building reduces the potential thermal insults from flames. However, embers can still accumulate at the base of a door and potentially penetrate through the door jamb. IBHS's post-Marshall Fire (2021) investigation in Boulder County, Colorado, showed damage to exterior doors due to ember accumulation at the base, as can be seen in Figure 1a. Figure 1b demonstrates ignition of the door jamb due to ember penetration during the Victorian Bushfire (2009) in Australia [2].



Figure 1. ignition from accumulation of embers and debris at the base of the door.

This code change proposal intends to address this vulnerability by providing requirements for all buildings located in wildfire prone areas (IR1,2 and 3) to protect the exterior doors against embers.

Requiring a 6-in noncombustible vertical protection by a kickplate at the base of exterior doors or a storm door will reduce this vulnerability (Figure 2).



Figure 2. Protection for exterior doors (a) storm door, (b) kickplate.

The 6-in noncombustible vertical clearance at the base of the door can protect the exterior door assembly against embers. As a part of this effort, a new section was added to the IR1, 2, and 3 exterior doors to protect exterior underfloor access doors (Figure 3) against embers.



(a)



(b)

Figure 3. Exterior underfloor access doors (a) unprotected vs. (b) protected against embers.

Bibliography: [1] Maranghides, A., McNamara, D., Vihnanek, R., Restaino, J., & Leland, C. (2015). A Case Study of a Community Affected by the Waldo Fire Event Timeline and Defensive Actions (NIST Technical Note 1910). National Institute of Standards and Technology. <https://doi.org/10.6028/NIST.TN.1910>
[2] Leonard, J. (2009). Report to the 2009 Victorian bushfires Royal Commission. Building performance in bushfires (CSIRO Sustainable Ecosystems, Issue. CSIRO Sustainable Ecosystems.

Cost Impact: Increase

Estimated Immediate Cost Impact:

This code change will slightly increase the construction cost by requiring a 6-in noncombustible protection at the base for exterior doors and exterior underfloor access doors.

Estimated Immediate Cost Impact Justification (methodology and variables):

A web search of several retailers carrying kickplate, storm doors and a metal underfloor access door revealed that a kickplate costs approximately \$33, a storm door costs approximately \$400 and 12-in by 12-in metal underfloor access door costs around \$40. Additional labor costs are estimated to be negligible.

WUIC46-24

IWUIC: 504.9.1 (New), ASTM Chapter 07, UL Chapter 07

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Add new text as follows:

504.9.1 Garage door perimeter gap. Exterior garage doors for vehicles shall resist the intrusion of embers by protecting the gaps between each door and the opening at the bottom, sides and top by all of the following:

1. Bottom opening shall provide a maximum gap of 1/8 inch (3.2 mm) between the surface and the door opening seal.

2. Sides and top by one or more of the following:

2.1 Provide a maximum gap of 1/8 inch (3.2 mm) between the door and the door opening.

2.2 Cover or block the gap with weather-stripping products constructed of materials which comply with both of the following:

2.2.1 The tensile strength of the material shall be tested in accordance with ASTM D638 before and after light exposure in accordance with ASTM G155 for a period of 2000 hours, and the maximum allowable difference in tensile strength values between exposed and non-exposed samples shall not exceed 10 percent.

2.2.2 The material shall be tested in accordance with UL 94 and have a flammability rating of V-2 or better.

2.3 Cover or block the gap with metal flashing.

Revise as follows:

ASTM

D638-22

Standard Test Method for Tensile Properties of Plastics.

G155—21

Practice for Operating Xenon Arc Light Apparatus For Exposure of Nonmetallic Materials

UL

94-2023

Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, 7th edition

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

Staff Analysis: A review of the following standards proposed for inclusion in the code regarding some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024:

- ***Standard Test Method for Tensile Properties of Plastics (ASTM D638-22)***
- ***Practice for Operating Xenon Arc Light Apparatus For Exposure of Nonmetallic Materials (ASTM G155-21)***
- ***Safety of Flammability of Plastic Materials for Parts in Devices and Appliances, 7th edition (UL 94-2023)***

Reason: One of the issues with wildland fires is the spread of flaming or hot embers into structures. This proposal is intended to address protection of vehicle door of a garage to reduce this exposure and eliminate a route of ember entry by addressing the gap created between the garage door and the garage door opening.

Section 504.9.1 requires a battery backup for motorized garage door openers. Often in a wildland fire, utility power is shut down, or damaged, to an area or region. When the utility power is no longer available, and the residents need to evacuate, the garage door can still be opened to allow vehicles to exit and then closed to protect the opening into the garage.

Section 504.9.2 addresses the gap, or clearance, provided around the garage door allowing for door movement and operation. This gap needs to be evaluated to inhibit the passage of flaming embers. There are four methods of protection offered in this section: 1) design the door so there is a maximum 1/8" gap on all four sides of the door; 2) provide weatherstripping to cover or fill the gap—weatherstripping must be designed to stay in place during the impact of the fire so criteria is provided (Items 2.1 and 2.2) to address the strength and

flammability of the material; and 3) install metal flashing to cover the gap. Any one of the methods can be utilized, or a combination of these methods will suffice. For example, the door may have less than a 1/8" gap along the header (Item 3) and be provided with weatherstripping on the bottom and sides (Item 2).

As part of the requirements for protecting the gap, new test standards are included to ensure that where weather-stripping is chosen as the solution, the weather-stripping material is reliable and dependable for the purpose.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: Increase

Estimated Immediate Cost Impact:

The approximate cost of compliance to add an approved protection material around the edges of a vehicle garage door is \$50. As this is only one of the compliance options, the added cost will be applicable in an estimated 1/3 to 1/2 of the cases.

Estimated Immediate Cost Impact Justification (methodology and variables):

The materials needed for compliance with this proposal are readily available in the retail and wholesale building supply chain. Installation labor is minimal or can be DIY.

WUIC46-24

WUIC47-24

IWUIC: 504.9.1 (New), UL Chapter 07

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Add new text as follows:

504.9.1 Garage doors.. Automatic garage door openers for vehicle use in a residential building, where provided, shall be *listed and labeled* in accordance with UL 325 and shall be installed in accordance with the manufacturer's instructions. The opener shall be equipped with battery backup or a secondary power supply shall be provided.

Revise as follows:

UL

325—2017

Door, Drapery, Gate, Louver, and Window Operators and Systems

UL LLC
333 Pfingsten Road
Northbrook, IL 60062-2096

Staff Analysis: The standard proposed for inclusion in the code, Door, *Drapery, Gate, Louver, and Window Operators and Systems (UL 325-2017)*, is currently referenced in the IRC.

Reason: One of the tragic situations that has occurred in wildland fires is the inability to open the electrically operated garage door vehicle doors so the occupants can utilize their vehicle to evacuate as a fire approaches. This proposal adds Section 504.9.1 which will require garage doors in the interface area to be provided with backup power for operation when utility power is unavailable.

Section 504.9.1 requires a battery backup for motorized garage door openers. Often in a wildland fire, utility power is shut down or power lines are damaged—both possibly affecting an entire area or region. Regardless of the cause, when utility power is no longer available and residents need to evacuate, the backup power supply will allow the garage door to be opened allowing occupants and vehicles to exit. After the occupants have driven out of the garage, the garage door can then be closed to protect the opening into the garage from the approaching fire.

It is true that motorized garage door opening devices have a release to allow for manual operation; however, manual operation is difficult, if not impossible, for elderly residents. Even if they are able to open the door, they most likely will not stop the vehicle to return and manually close the garage door as they evacuate. The battery backup allows for the normal opening and closing that they are accustomed to and increases the likelihood that the garage door will be closed when they depart.

In October 2017 Northern California wildfires were the most deadly in California's history, killing 43 people and forcing thousands to evacuate from their homes. News media told the story of one Santa Rosa resident who was obstructed from evacuating her home when her garage door would not open as a result of an associated power outage. With the help of neighbors, she was able to manually open the door and escape. Not everyone was so fortunate. It has been reported that at least five of people lost their lives during the evacuation because they could not get out of their garages because of the power outages. Several people were found in their cars inside their garage. As strong winds accelerate the spread of wildfires, utilities often shut off the power to prevent a falling line from igniting new fires. Several utilities routinely shut down power during specific weather conditions as part of a pre-emptive plan to eliminate a potential fire start should an active power line be damaged and fall as a result of the weather. Cutting power increases the risk of residents being blocked by their garage doors, which do not operate during an outage. Requiring that automatic garage door openers include a backup battery will assist residents in safely evacuating their residence during an evacuation.

Providing a battery backup for garage door openers is not a new concept. The technology and equipment for battery backup is currently available. Manufacturers offer a battery backup as an option for new devices, and even offer a battery backup kit that can be added to existing garage door openers. Garage door opener manufacturers have been providing a backup battery for all garage door openers sold in California since January 1, 2019.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle,

which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: Increase

Estimated Immediate Cost Impact:

This proposal does not mandate the installation or use of an automatic garage door opener. For owners that choose to purchase one, a new garage door opener with an integral backup battery costs approximately \$30-\$40 more than an opener with no battery backup.

Estimated Immediate Cost Impact Justification (methodology and variables):

Average retail price for automatic door openers with and without battery backup.

WUIC47-24

WUIC48-24

IWUIC: 504.10, 505.10

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Wildland Urban Interface Code

Revise as follows:

504.10 Vents.

Where provided, ~~ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening~~ intended to permit ventilation, either in a horizontal or vertical surface, shall be in accordance with Section 504.10.1 or Section 504.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

505.10 Vents.

Where provided, ~~ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening~~ intended to permit ventilation, either in a horizontal or vertical surface, shall be in accordance with Section 505.10.1 or Section 505.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

Reason: The existing charging language of sections 504.10 and 505.10 contains a lengthy and potentially incomplete list which includes a mixture of constructions (e.g., enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces) and ventilation opening locations (e.g., gable ends, ridge ends, under eaves and cornices, foundations). However, a careful review of the current language reveals the intent is for the provisions to apply to any "opening intended to permit ventilation." This proposal simplifies the charging language by removing the list and relying on the heart of the provision, i.e., all ventilation openings are to be protected.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal makes no technical change to existing provisions. Therefore, there should be no impact on construction cost. See also the proponent's reason statement.

WUIC48-24

WUIC49-24

IWUIC: 504.10, 504.10.1, 504.10.2, 505.10, 505.10.1, 505.10.2, ASTM Chapter 07 (New)

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

504.10 Vents.

Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical surface, shall be in accordance with Section 504.10.1 or Section 504.10.2 ~~to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.~~

504.10.1 Performance requirements.

Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

Joists around such vents shall be sealed with sealants complying with ASTM E814 or ASTM E1966 and in accordance with vent manufacturer installation instructions to avoid flame intrusion through the joints.

504.10.2 Prescriptive requirements.

Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces 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 1/8 inch (3.2 mm) or shall be designed and approved to prevent flame or ember penetration into the structure.

Revise as follows:

505.10 Vents.

Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical surface, shall be in accordance with Section 505.10.1 or Section 505.10.2 ~~to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.~~

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Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces 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 1/8 inch (3.2 mm) or shall be designed and approved to prevent flame or ember penetration into the structure.

Add new standard(s) as follows:

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken, PA 19428-2959

ASTM E814-2013A(2017) Standard Test Method for Fire Tests of Penetration Firestop Systems

ASTM E1966-15 (Reapproved 2019) Standard Test Method for Fire-Resistive Joint Systems

Staff Analysis: The following standards proposed for inclusion in the code are currently referenced by the IBC:

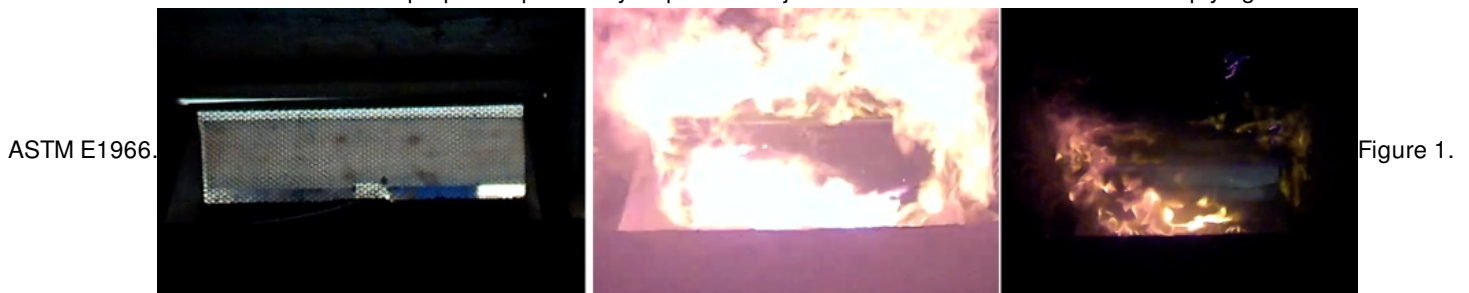
- **Standard Test Method for Fire Tests of Penetration Firestop Systems (ASTM E814-2013A(2017))**
- **Standard Test Method for Fire-Resistive Joint Systems (ASTM E1966-15 (Reapproved 2019))**

Reason: This code modification is intended to improve the fire performance of and enhance the clarity of the existing IWUI code requirements related to vents.

The last sentence in the charging paragraph is deemed unnecessary and potentially misleading. This sentence stipulates that vents must be constructed according to either the performance or prescriptive requirements to resist ember and "flame" intrusion. While performance-based requirements can achieve ember and flame resistance, prescriptive requirements only protect against ember intrusion, not flame intrusion. Deleting this unnecessary portion of the charging paragraph will eliminate confusion around flame intrusion and accurately acknowledge that mesh screens can only resist ember intrusion.

The second concern pertains to flame intrusion through joints around approved vents tested in accordance with ASTM E2886.

Experiments at the IBHS research center revealed that, in the absence of appropriate sealant, flames can pass through unsealed joints around these vents (see Figure 1). A review of approved vent manufacturers' installation instructions regarding sealants for vent joints revealed some inconsistencies. This proposal specifically requires vent joints to be sealed with a sealant complying with ASTM E814 or



Fire intrusion through the joints around an ASTM E2886 approved eave vent.

Cost Impact: Increase

Estimated Immediate Cost Impact:

The primary purpose of this modification is to enhance the clarity of IWUIC provisions regarding the fire performance of vents. Most manufacturers of these vents already require a specific fire resistant sealant as part of their installation instructions. For these manufacturers, this proposal will not have any impact on the cost of construction. However, for manufacturers that do not specify a sealant, it is anticipated that this proposal will have a cost impact of \$15-\$30 depending on the number of ventilation openings and the size of the building. For typical single family dwellings, it is estimated that one tube of sealant (approximately \$15) will be sufficient to seal all ventilation openings.

Estimated Immediate Cost Impact Justification (methodology and variables):

A web search of several retailers carrying sealants complying with ASTM E814 or ASTM E1966 revealed that one tube of sealant costs approximately \$15. Additional labor costs are estimated to be negligible.

WUIC50-24

IWUIC: 504.10.3, 505.10.3

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Wildland Urban Interface Code

Revise as follows:

504.10.3 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.

505.10.3 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.

Reason: Sections 504.10 and 505.10 permit ventilation openings "for enclosed attics, ... under eaves and cornices, enclosed eave soffit spaces, [and] enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters" Sections 504.10.3 and 505.10.3 expressly exclude attic ventilation openings "located in soffits, in eave overhangs, between rafters at eaves or in other overhang areas." This proposal corrects this logical inconsistency by removing the restriction on vents located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas from Sections 504.10.3 and 505.10.3. Vents must comply with the performance or prescriptive requirements within Sections 504.10 or 505.10, and those that do so should be permitted for any ventilation opening regardless of location.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal corrects a logical inconsistency between code sections for IR 1 and IR 2 construction. As such, the changes proposed are not expected to change the cost of construction.

WUIC50-24

WUIC51-24

IWUIC: 504.10, 504.10.2, 505.10, 505.10.2, 506.5

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Wildland Urban Interface Code

Revise as follows:

504.10 Vents.

Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, ~~either in a horizontal or vertical surface~~, shall be in accordance with Section 504.10.1 or Section 504.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

504.10.2 Prescriptive requirements.

~~Where provided, attic ventilation~~ Ventilation openings, ~~foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces and vents through roofs shall not exceed 144 square inches (0.0929 m²) each. Such vents shall be fully covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm) or~~ with vents shall be designed and approved ~~approved~~ to prevent flame or ember penetration into the structure.

505.10 Vents.

Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, ~~either in a horizontal or vertical surface~~, shall be in accordance with Section 505.10.1 or Section 505.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

505.10.2 Prescriptive requirements.

~~Where provided, attic ventilation~~ Ventilation openings, ~~foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces and vents through roofs shall not exceed 144 square inches (0.0929 m²) each. Such vents shall be fully covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm) or~~ with vents shall be designed and approved ~~approved~~ to prevent flame or ember penetration into the structure.

506.5 Vents.

~~Where provided, attic ventilation~~ 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 m²) each. Such vents shall be fully covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm) or~~ with vents shall be designed and approved ~~approved~~ to prevent flame or ember penetration into the structure.

Reason: This proposal makes changes to the IWUIC vent provisions (1) to clarify that ventilation openings are permitted on sloped surfaces, (2) to remove the ventilation opening size limitation from the prescriptive compliance option, and (3) to require full coverage of ventilation openings regardless of the compliance path. Also, the proposal cleans up the prescriptive options (sections 504.10.2 and 505.10.2) and section 506.5 by removing the unnecessary and potentially confusing list of ventilation opening locations.

Ventilation Openings on Sloped Surfaces. The ventilation sections in the 2024 IWUIC restrict ventilation openings to horizontal or vertical surfaces. This could imply that ventilation openings on sloped surfaces (e.g., rooftops) are not subject to these requirements, which is not understood to be the intention or a desirable interpretation. Ventilation openings on all surfaces of the building should provide protection, and removal of the restriction to horizontal and vertical surfaces from sections 504.10 and 505.10 clarifies that all ventilation openings must be addressed.

Prescriptive Option Size Limitation. The size of ventilation openings is limited to 144 square inches when complying via the prescriptive option. This restriction has been in the IWUIC since the first edition, but no technical justification was discovered during an examination of the available code development records or through discussions with several parties involved in creation of the original IWUIC and California Building Code Chapter 7A provisions. It is worth noting that California provisions have not included such a size limitation.

Full Coverage of Ventilation Openings. The performance compliance option in sections 504.10.1 and 505.10.1 includes the important provision that ventilation openings be fully covered. This proposal adds this practical requirement to the prescriptive path and to section 506.5.

Cleanup. Sections 504.10.2, 505.10.2 and 506.5 include an unnecessary list of ventilation opening locations. In their simplest form, these sections state, "Where provided, ventilation openings ... in vertical or horizontal surfaces and vents through roofs" The intention is clearly to require these provisions to apply to any ventilation opening. The cleanup simplifies the language and eliminates potential misinterpretation of the requirements.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The changes offered in this proposal primarily improve clarity of existing provisions. Removal of the ventilation opening size restriction which is present in the prescriptive requirements should not affect construction cost because the existing performance path already provides a means to demonstrate compliance for vents installed over ventilation openings which are larger than 144 square inches.

WUIC51-24

WUIC52-24

IWUIC: 504.11, 504.11.1, 505.11, 505.11.1

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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 in accordance with Section 504.5, underfloor areas constructed in accordance with Section 504.6, roof assemblies constructed in accordance with Section 504.2, gutters and downspouts constructed in accordance with Section 504.4 and vents constructed in accordance with Section 504.10.

Where detached accessory structures are located less than 20 feet (6096 mm) from a building containing habitable space, exterior glazing and exterior doors in the detached accessory structure shall not be located in walls that face the building containing habitable space.

Exception: Exterior glazing complying Section 504.8 and exterior doors complying Section 504.9.

~~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.~~

Delete without substitution:

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.~~

Revise as follows:

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 in accordance with Section 505.5, underfloor areas constructed in accordance with Section 505.6, roof assemblies constructed in accordance with Section 505.2, gutters and downspouts constructed in accordance with Section 505.4 and vents constructed in accordance with Section 505.10.

Where detached accessory structures are located less than 20 feet (6096 mm) from a building containing habitable space, exterior glazing and exterior doors in the detached accessory structure shall not be located in walls that face the building containing habitable space.

Exception: Exterior glazing complying Section 505.8 and exterior doors complying Section 505.9.

~~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.~~

Delete without substitution:

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.~~

Reason: This proposal is intended to improve and enhance the construction of detached accessory structures in Class 1 and Class 2 ignition-resistant construction. The current language in sections 504.11 and 505.11 contains three primary flaws:

1. The requirements fail to completely safeguard detached accessory structures from ember exposure, which is the most likely scenario in a wildfire event. Consequently, this lack of protection against embers may jeopardize the primary structure, making it vulnerable to direct flame contact and radiant heat exposure emanating from the detached accessory structure.
2. The requirements for exterior walls of detached accessory structures do not align completely with the requirements for the exterior walls of the main structure. Specifically, these sections do not refer to ignition-resistant materials.
3. The requirements for the underfloor area of detached accessory structures in Sections 504.11.1 and 505.11.1 are essentially the same as the requirements in Sections 504.7.1 and 505.7.1 pertaining to appendages and projections. However, they should conform to the requirements for the underfloor areas of structures outlined in sections 504.6 and 505.6.

The proposed language addresses these issues through three key revisions:

1. New language incorporates specific references to requirements for roof assemblies, gutters and downspouts, vents, and windows and doors for detached accessory structures to enhance their resistance to embers.
2. Referring to sections 504.5 and 505.5 for exterior walls to ensure comprehensive coverage and prevent future misalignment.
3. Referring to sections 504.6 and 505.6 for underfloor areas to ensure all possible options are available, reducing the likelihood of confusion and misalignment.

While the second and third items above are primarily intended to correlate the technical requirements with the current language, the first item is intended to enhance the ember resistance of detached accessory structures. It does this by mandating a Class A roof assembly, noncombustible gutters and downspouts, gutter protection, and vent protection. Additionally, it restricts the proximity of exterior openings facing the main structure to a minimum of 20 feet. This restriction is designed to shield the main structure from potential direct flame contact and radiant heat exposure caused by fire jetting out of window and door openings in detached accessory structures.

Based on structural separation experiments conducted by IBHS and NIST [1-3] and observations during these experiments, (see Figure 1) it is evident that the orientation of openings plays a significant role in the fire exposure for the target structure, particularly when the detached accessory structure is located less than 20 feet from the building. Therefore, it is recommended that openings in detached accessory structures located within this range not be located in walls that face the primary structure.



Figure 1. Possible fire exposure to target structure caused by noncombustible detached accessory structures 20 ft away from target structure.

Bibliography:

1. Maranghides, A., Link, E. D., Nazare, S., Hawks, S., McDougald, J., Quarles, S. L., & Gorham, D. J. (2022). *WUI Structure/Parcel/Community Fire Hazard Mitigation Methodology*. Department of Commerce. National Institute of Standards and Technology. <https://doi.org/10.6028/NIST.TN.2205>
2. Maranghides, A., Nazare, S., Hedayati, F., Gorham, D., Link, E., Hoehler, M., ... & Walton, W. (2022). *Structure Separation Experiments: Shed Burns without Wind*. National Institute of Standards and Technology, US Department of Commerce. <https://doi.org/10.6028/NIST.TN.2235>
3. Maranghides, A., Nazare, S., Butler, K. M., Johnsson, E. L., Link, E., Bundy, M., ... & Frievalt, F. (2023). *NIST Outdoor Structure Separation Experiments (NOSSE) with Wind*. <https://doi.org/10.6028/NIST.TN.2253>
4. Barrett, K., Quarles, S., Gorham, D. (2022). *Construction costs for a wildfire-resistant home, California edition*. Headwaters Economics and Institute for business & home safety (IBHS).

Cost Impact: Increase

Estimated Immediate Cost Impact:

The proposed alteration will result in increased construction costs as it necessitates compliance with specific sections concerning the roof assembly, gutters, vents, and openings within a 20-foot proximity to the main structure.

Estimated Immediate Cost Impact Justification (methodology and variables):

In 2022, a study conducted by IBHS and Headwaters Economics assessed the expenses associated with constructing more wildfire-resistant homes in California. According to the findings, addressing the vulnerability of various elements, including those mentioned above, can be achieved for a cost of less than \$3,000 during new construction [4].

Estimated Life Cycle Cost Impact:

The proposed change also has cost advantages, both in the short and long term, of implementing new requirements that will enhance the safety of first responders during a wildfire incident, as well as improve fire and life safety measures.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

This proposal will enhance the resilience of detached accessory structures to ember exposure, consequently improving the fire safety of buildings with living spaces next to these detached structures. This increased resilience at the property level will yield lasting economic advantages for the community and the businesses within it.

WUIC53-24

IWUIC: SECTION 503, 503.1, TABLE 503.1, 503.2, 503.2.1, 503.2.2, 503.2.3, 503.2.4, 503.2.4.1, 503.2.4.2, 503.2.4.3, 503.2.4.3.1, 503.2.4.3.2, 503.2.4.3.3

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Cary Yballa, Central County Fire Department, Cal FPO (cyballa@ccfd.org); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov)

2024 International Wildland Urban Interface Code

Revise as follows:

SECTION 503 IGNITION-RESISTANT WILDLAND CONSTRUCTION AND MATERIAL

503.1 General.

Buildings and structures hereafter constructed, modified or relocated into or within *wildland-urban interface areas* shall ~~meet~~comply with 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 Section 504.~~ Materials required to be ignition-resistant materials shall comply with the requirements of Section 503.2.

Delete without substitution:

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.~~
- e. ~~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.~~

Revise as follows:

503.2 Ignition-resistant building material.

Ignition-resistant building materials shall be designed for exterior use and comply with any one of the requirements in Section 503.2.1 through ~~503.2.4~~ 503.2.4.3.3.

503.2.1 Noncombustible material.

Material shall comply with the definition of *noncombustible* materials in Section 202.

503.2.2 Fire-retardant-treated wood.

Fire-retardant-treated wood shall be identified for exterior use and shall meet the requirements of Section 2303.2 of the *International Building Code*.

503.2.3 Fire-retardant-treated wood roof coverings.

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

503.2.4 Ignition-resistant building material.

Material shall be tested on the front and back faces in accordance with the extended ASTM E84 or UL 723 test, for a total test period of 30 minutes, or with the ASTM E2768 test. The materials shall bear identification showing the fire test results. Panel products shall be tested with a ripped or cut longitudinal gap of $\frac{1}{8}$ inch (3.2 mm). The materials, 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, shall comply with Sections 503.2.4.1 through 503.2.4.3.

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.

503.2.4.1 Flame spread.

The material shall exhibit a flame spread index not exceeding 25.

503.2.4.2 Flame front.

The material shall exhibit a flame front that does not progress more than 10 feet 6 inches (3200 mm) beyond the centerline of the burner at any time during the test.

503.2.4.3 Weathering.

Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. The materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in Sections 503.2.4.3.1 through 503.2.4.3.3, as applicable to the materials and conditions of use.

503.2.4.3.1 Evaluation requirements for weathering.

Fire-retardant-treated wood, wood-plastic composite materials and plastic lumber materials shall be evaluated after weathering in accordance with Method A "Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D2898.

503.2.4.3.2 Wood-plastic composite materials.

Wood-plastic composite materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D7032 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

503.2.4.3.3 Plastic lumber materials.

Plastic lumber materials shall also demonstrate acceptable fire performance after weathering by the following procedure: first testing in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation, then weathering in accordance with ASTM D6662 and then retesting in accordance with ASTM E1354 and exhibiting an increase of no more than 10 percent in peak rate of heat release when compared to the peak heat release rate of the nonweathered material.

Reason: This code change proposes one construction method for buildings and structures in the wildland-urban interface area. This is a companion proposal to another proposal which deletes Sections 505 and 506. In other words, the other proposal removes Ignition Resistant Construction Classes 2 and 3. Replacing these multiple classifications with a single defined Ignition Resistant Construction as provided by Section 504 of this code. As the IWUIC is intended to provide a minimum standard of protection for the Wildland-Urban Interface areas, a single classification of Ignition Resistant Construction should be provided to accomplish the following goals:

1. Protect lives and property within the Wildland-Urban Interface areas
2. Provide clear and consistent standards, simplifying the construction process
3. Providing a minimum standard of protection, with appendices providing potential pathways for increased protection beyond the minimum

Defensible space is a component of home hardening and the benefits go hand in hand with the construction materials. Embers will find the path of least resistance.

Defensible space is the buffer between your structure and the surrounding area.

Adequate defensible space acts as a barrier to slow or halt the progress of fire that would otherwise engulf your property. It also helps ensure the safety of firefighters defending your home. Defensible space is the first line of defense for your home against wildfire.

The intensity of wildfire fuel management varies within the 100-foot perimeter of the home, with more intense fuels' reduction occurring closer to your home. Start at the home and work your way out to 100 feet or to your property line, whichever is closer. Learn more about the Defensible Space Zones below.

It takes the combination of both Defensible Space and Home Hardening to give your home and property the best chance of surviving a wildfire.

Bibliography: [Construction costs for a wildfire-resistant home: California edition - Headwaters Economics](#)

[Fire Research Division | NIST](#)

<https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2205.pdf>

Cost Impact: Increase

Estimated Immediate Cost Impact:

Construction costs for a typical single-family (1,750 square-foot) home would increase approximately \$2,000 including developer overhead costs

Estimated Immediate Cost Impact Justification (methodology and variables):

In 2004, and as a precursor to California adopting Building Code Chapter 7A, the Office of the State Fire Marshal requested an analysis identifying the costs and benefits associated with proposed regulations in the state's wildfire-prone areas. The study was conducted by Fire Cause Analysis and evaluated economic and construction data within various business sectors to analyze construction costs if proposed regulations were implemented.³³ The study found construction costs for a typical single-family (1,750 square-foot) home would increase approximately \$2,000 including developer overhead costs. As an aggregated total at the state level, construction costs would increase approximately \$30 million per year for the estimated 14,000 new homes built in areas where regulations would apply. The authors concluded the costs of not implementing regulations, in the form of property losses and suppression costs, exceeded the projected costs for regulations and therefore recommended adopting mitigation standards in wildfire-prone areas.

In 2019, the National Institute of Building Sciences (NIBS) released a report identifying the benefit-cost ratio (BCR) of investing in hazard mitigation, including wildfires.³⁵ The authors found that for every \$1 spent on up-front costs for wildfire mitigation, a benefit of \$4 was received.

In 2021, the National Research Council of Canada released a study analyzing the benefit-cost ratio for building new construction to comply with the country's wildland urban interface (WUI) Guide.³⁸ In its examination, approximately \$12,000 CAD (~\$9,500 USD) was added to the overall costs for a new, 2,000-square-foot home to meet the provision of Canada's National WUI Guide. The comprehensive report also examined costs for retrofitting existing structures, as well as transferred costs at the community and national scale. Similar to the NIBS study in 2019, the NRC report found an up-front investment in wildfire-resistant construction and vegetation management yielded benefits that exceeded long-term costs and losses.

WUIC53-24

WUIC54-24

IWUIC: SECTION 504, 504.1, 504.2, 504.2.1 (New), 504.2.1, 504.2.3 (New), 504.3, 504.3.1 (New), 504.4, 504.5, 504.5.1 (New), 504.5.1, 504.6, 504.7, 504.7.1, 504.7.2 (New), 504.7.3 (New), 504.7.3.1 (New), 504.7.3.2 (New), 504.7.3.3 (New), 504.7.3.3.1 (New), 504.7.3.3.2 (New), 504.7.3.4 (New), 504.8, 504.8.1 (New), 504.8.2 (New), 504.9, 504.9.1 (New), 504.9.2 (New), 504.9.3 (New), 504.10, 504.10.1, 504.10.2, 504.10.3, 504.11, 504.11.1, 504.11.2 (New), 504.11.3 (New), 504.11.4 (New), 504.11.5 (New), 504.11.6 (New)

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com); Cary Yballa, Central County Fire Department, Cal FPO (cyballa@ccfd.org); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov)

2024 International Wildland Urban Interface Code

Revise as follows:

SECTION 504 ~~CLASS 1 IGNITION-RESISTANT CONSTRUCTION CONSTRUCTION~~ METHODS FOR EXTERIOR WILDFIRE EXPOSURE

504.1 General.

~~Class 1 ignition-~~Ignition-resistant construction shall be in accordance with Sections 504.2 through ~~504.11~~ 504.11.6.

504.2 Roof assembly.

Roofs shall have a *roof assembly* that complies with a Class A ~~rating~~ fire classification 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*.

Add new text as follows:

504.2.1 Roof covering gaps. Roof covering gaps and voids shall be protected as follows:

1. Where the roofing covering profile has an airspace under the roof covering and is installed over a combustible deck, the combustible deck shall be protected by any of the following:
 - 1.1 Install a 72-pound (32.7 kg) cap sheet, complying with ASTM D3909, over the roof deck.
 - 1.2 Install mineral wool board or other noncombustible material with a minimum thickness of 1 inch (25.4 mm) between the roofing material and the wood framing or deck.
 - 1.3 Install a Class A fire classification roof underlayment, tested in accordance with ASTM E108 or UL 790. If the sheathing consists of exterior fire-retardant treated wood, the underlayment shall not be required to comply with a Class A classification.
2. Bird stops shall be used at the eaves, when the profile fits, to prevent debris from entering at the eave. Hip and ridge caps shall be mudded to prevent intrusion of fire or embers.

Revise as follows:

504.2.1-504.2.2 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 (32.47 kg) mineral-surfaced, nonperforated cap sheet complying with ASTM D3909 running the full length of the valley.

Add new text as follows:

504.2.3 Skylights. Skylights, including tubular daylighting devices and sloped glazing shall comply with section 504.8

Revise as follows:

504.3 Protection of enclosed eaves.

The exposed underside of enclosed roof eaves and soffits shall be protected on the exposed underside by any of the following:

1. Noncombustible materials.
2. Ignition-resistant materials, or by
3. Fire-retardant-treated wood labeled for exterior use.
4. Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side.
5. 2-inch (51 mm) nominal dimension lumber, or
6. 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.
7. Boxed-in roof eave soffit assemblies with an underside that meets the performance criteria in Section 504.7.2 when tested in accordance with the test procedures set forth in ASTM E2957.

Fascias are required and shall be protected on the backside by ignition-resistant materials, fire retardant-treated wood labeled for exterior use or by materials approved for not less than 1-hour fire-resistance-rated construction or 2-inch (51 mm) nominal dimension lumber.

Add new text as follows:

504.3.1 Protection of open eaves. The exposed roof deck on the underside of unenclosed roof eaves shall consist of one or more of the following:

1. Noncombustible material.
2. Ignition-resistant material.
3. Fire-retardant-treated wood labeled for exterior use.
4. Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side.
5. 2-inch (51 mm) nominal dimension lumber.
6. One layer of 5/8-inch (16 mm) Type X gypsum sheathing applied behind an exterior covering on the underside of the roof deck.
7. The exterior portion of a 1-hour fire-resistance-rated exterior assembly applied to the underside of the roof deck designed for exterior fire exposure, including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.

Fascias, if provided, shall be of fire-retardant-treated wood, ignition-resistant materials, 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.

Revise as follows:

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. Assembly of sawn lumber or glue-laminated wood with the smallest minimum nominal dimension of 4 inches (102 mm). Sawn or glue-laminated planks splined, tongue-and-groove or set close together and well spiked.
4. Log wall construction. Assembly that has been tested in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in ASTM E2707 with the conditions of acceptance shown in Section 504.9.3.
5. Wall assemblies suitable for exterior fire exposure containing one layer of 5/8-inch (15.9 mm) Type X gypsum sheathing applied behind the exterior wall covering or cladding on the exterior side of the framing.
4. 6. ~~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. 7. ~~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.

Add new text as follows:

504.5.1 Exterior wall coverings. The exterior wall covering shall comply with one or more of the following requirements, except as permitted for exterior walls complying with Section 504.5:

1. Noncombustible material.
2. Ignition-resistant material labeled for exterior use.
3. Fire-retardant-treated wood. The fire-retardant-treated wood shall be labeled for exterior use and shall meet the requirements of Section 2303.2 of the International Building Code.

Revise as follows:

504.5.1.2 Flashing.

A minimum of 6 inches (152 mm) of metal flashing or noncombustible material applied vertically on the exterior of the wall shall be installed at the ground, decking and roof intersections.

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.

Revise as follows:

504.7 Appendages and projections Projections.

~~Unenclosed accessory structures~~ attached to buildings with habitable spaces and projections, ~~such as other than~~ 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~~ 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.~~

4. Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side, as tested in accordance with ASTM E119 or UL 263.
5. One layer of 5/8-inch (15.9 mm) Type X gypsum sheathing applied behind the exterior covering on the underside of the ceiling.
6. The exterior portion of a 1-hour fire-resistance-rated exterior assembly, as tested in accordance with ASTM E119, applied to the underside of the ceiling assembly, including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.
7. The underside of a floor projection assembly that meets the performance criteria in Section 504.7.2 when tested in accordance with the test procedures set forth in ASTM E2957.

504.7.1 Underfloor areas Underside of projections.

~~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.~~

~~The underside of projections shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall be protected by one or more of the following:~~

Exception: Structural columns and beams are not required to be protected in accordance with Section 504.7.1 when constructed with sawn lumber or glue-laminated wood with the smallest minimum nominal dimension of 4 inches (102 mm). Sawn or glue-laminated planks shall be splined, tongue-and-groove, or set close together and well spiked.

1. Noncombustible material.
2. The ignition-resistant material shall be labeled for exterior use and shall meet the requirements of Section 503.2.
3. The fire-retardant-treated wood shall be labeled for exterior use and shall meet the requirements of Section 2303.2 of the International Building Code.
4. Materials approved for not less than 1-hour fire-resistance-rated construction on the exterior side, as tested in accordance with ASTM E119 or UL 263.
5. One layer of 5/8-inch (15.9 mm) Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection.
6. The exterior portion of a 1-hour fire-resistance-rated exterior assembly, as tested in accordance with ASTM E119 or UL 263, applied to the underside of the floor, including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual.
7. The underside of a floor assembly that meets the performance criteria in Section 504.7.2 when tested in accordance with the test procedures set forth in ASTM E2957.

Add new text as follows:

504.7.2 Conditions of acceptance for ASTM E2957. The ASTM E2957 test shall be conducted on a minimum of three test specimens and meet the conditions of acceptance in Items 1 through 3 below. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be performed. All three additional tests must meet the conditions of acceptance.

1. Absence of flame penetration of the eaves or horizontal projection assembly at any time.
2. Absence of structural failure of the eaves or horizontal projection subassembly at any time.
3. Absence of sustained combustion of any kind at the conclusion of the 40-minute test.

504.7.3 Decks. The walking surface material of decks, porches, balconies and stairs shall comply with the requirements of Sections 504.7.3.1 through 504.7.3.4.

504.7.3.1 Flashing. A minimum of a 6-inch (150 mm) metal flashing, applied vertically on the exterior of the wall, shall be installed at all deck-to-wall intersections.

504.7.3.2 Decking surfaces. The walking surface material of decks, porches, balconies and stairs shall be constructed with any of the following materials:

1. Material that complies with the performance requirements of Section 504.7.3.3.
2. Ignition-resistant material that complies with the performance requirements of Section 504.7.2.
3. Fire-retardant-treated wood labeled for exterior use and shall meet the requirements of section 2302 of the International Building Code.
4. Noncombustible material.
5. Any material that complies with the performance requirements of Section 504.7.3.4 when tested in accordance with ASTM E2632 provided that any attached exterior wall covering is noncombustible or ignition-resistant materials.

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

504.7.3.3 Performance requirements for Section 504.7.3.2, Item 1. Materials shall be tested in accordance with both ASTM E2632 and ASTM E2726 and comply with the conditions of acceptance in Sections 504.7.3.3.1 and 504.7.3.3.2. The material shall also be tested in accordance with ASTM E84 or UL 723 and comply with the performance requirements of Section 503.2.4.

504.7.3.3.1 Conditions of acceptance for ASTM E2632. The ASTM E2632 test shall be conducted on a minimum of three test specimens and meet the conditions of acceptance in Items 1 through 3 below. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be performed. All three additional tests must meet the conditions of acceptance.

1. Peak heat release rate of less than or equal to 25 kW/ft² (269 kW/m²).
2. Absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40-min observation period.
3. Absence of falling particles that are still burning when reaching the burner or floor.

504.7.3.3.2 Conditions of acceptance for ASTM E2726. The ASTM E2726 test shall be conducted, using a "Class A" size roof test brand, on a minimum of three test specimens and meet the conditions of acceptance in Items 1 and 2 below. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be performed. All three additional tests must meet the conditions of acceptance.

1. Absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40-minute observation period.
2. Absence of falling particles that are still burning when reaching the burner or floor.

504.7.3.4 Performance requirements for Section 504.7.3.2, Item 5. The ASTM E2632 test shall be conducted on a minimum of three test specimens and meet the condition of acceptance in Item 1 below. If any one of the three tests does not meet the condition of acceptance, three additional tests shall be performed. All three additional tests must show a peak heat release rate shall be 25 kW/ft² (269 kW/ m²) or less.

Revise as follows:

504.8 Exterior glazing.

Exterior windows, window walls and exterior glazed doors having a glazed area of 25 percent or more of the door area, windows within exterior doors, and skylights shall be constructed of any of the following:

1. ~~tempered glass, multilayered glazed panels;~~ Multilayered glazed panels with at least one tempered panel or dome complying with Section 2406 of the International Building Code. ;
2. ~~glass~~ Glass block units. ; ~~or have a~~
3. A minimum fire-protection rating of not less than 20 minutes when tested in accordance with NFPA 257 or UL 9, and shall be exempt from the hose stream test.

Add new text as follows:

504.8.1 Structural glass veneer. The wall assembly behind structural glass veneer shall comply with Section 504.5.

504.8.2 Operable skylights. Operable skylights shall be protected by a non-combustible mesh screen and the dimensions of the openings in the screen shall not exceed 1/8 inch (3.2 mm).

Revise as follows:

504.9 Exterior doors.

Exterior doors shall be constructed in accordance with any of the following:

1. ~~approved noncombustible~~ Noncombustible construction.;
2. ~~solid-core~~ Solid-core wood not less than 1³/₄ inches thick (44 mm). ~~or~~
3. ~~have~~ Have a fire protection rating of not less than 20 minutes when tested according to NFPA 252.
4. The exterior door shall be constructed of solid core wood that complies with the following requirements:
 - 4.1. Stiles and rails shall not be less than 1 3/8 inches (35 mm) thick.
 - 4.2. Panels shall not be less than 1 1/4 inches thick, except for the exterior perimeter of the panel that shall be permitted to taper to a tongue not less than 3/8 inch (35 mm) thick.
5. The exterior surface or cladding shall be tested to meet the performance requirements of Section 504.9.3 when tested in accordance with ASTM E2707 with the conditions of acceptance shown in Section 504.9.3.

Windows within doors and exterior glazed doors shall be in accordance with Section 504.8.

Exception: ~~Vehicle access doors.~~

Add new text as follows:

504.9.1 Garage doors. Automatic garage door openers for vehicle doors serving a residential building shall be equipped with a battery backup function.

504.9.2 Garage door perimeter gap. Exterior garage doors shall resist the intrusion of embers from entering by preventing gaps between doors and door openings, at the bottom, sides and tops of doors, from exceeding 1/8 inch (3.2 mm). Gaps between doors and door openings shall be controlled by one of the following methods:

1. Weather-stripping products shall be constructed of materials which comply with both of the following:
 - 1.1. The tensile strength of the material shall be tested in accordance with ASTM D638 before and after exposure to ASTM G155 for a period of 2,000 hours, and the maximum allowable difference in tensile strength values between exposed and non-exposed samples shall not exceed 10 percent.
 - 1.2. When tested to UL 94, the materials shall have a flammability rating of V-2 or better.
2. Door overlaps onto jambs and headers.

3. Garage door jambs and headers covered.

504.9.3 Conditions of acceptance for ASTM E2707. The ASTM E2707 test shall be conducted on a minimum of three test specimens and meet the conditions of acceptance in Items 1 and 2 below. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be performed. All three additional tests must meet the conditions of acceptance.

1. Absence of flame penetration through the wall assembly at any time.
2. Absence of evidence of glowing combustion on the interior surface of the assembly at the end of the 70-minute test.

504.10 Vents.

Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical surface, shall be in accordance with Section 504.10.1 or Section 504.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

504.10.1 Performance requirements.

Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

Delete and substitute as follows:

504.10.2 Prescriptive requirements.

~~Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces 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 1/8 inch (3.2 mm) or shall be designed and approved to prevent flame or ember penetration into the structure.~~

504.10.2 Off ridge and ridge vents. Vents that are installed on a sloped roof, such as dormer vents, shall comply with all of the following:

1. Vents shall be covered with a mesh where the dimensions of the mesh therein shall be a minimum of 1/16 inch (1.6 mm) and shall not exceed 1/8 inch (3.2 mm) in diameter.
2. The mesh material shall be noncombustible.
3. The mesh material shall be corrosion resistant.

504.10.3 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.

Delete and substitute as follows:

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 Accessory buildings and miscellaneous structures. Accessory buildings and miscellaneous structures shall be constructed to conform to the ignition-resistance requirements of Sections 504.11.1 through 504.11.6.

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.~~

504.11.1 Applicability. Sections 504.11.2 through 504.11.6 apply to accessory buildings, and attached or detached miscellaneous structures, on the same lot as an applicable building, including but not limited to trellises, arbors, patio covers, gazebos and similar structures.

Exceptions:

1. Decks shall comply with the requirements of Section 504.7.3.
2. Awnings and canopies shall comply with the requirements of Section 3105 of the International Building Code.

Add new text as follows:

504.11.2 Miscellaneous structures and accessory buildings within 3 feet. Miscellaneous structures and accessory buildings of any size, when separated from an applicable building on the same lot by a distance of less than 3 feet (914 mm), shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section 503.2.4.

504.11.3 Accessory buildings greater than 120 square feet, located 3 feet or more but less than 50 feet. Accessory buildings that are greater than 120 square feet (11.15 m²) in size and separated from an applicable building on the same lot by a distance of 3 feet (914 mm) or more but less than 50 feet (15 240 mm) shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section 503.2.4., located 3 feet or more but less than 50 feet.

504.11.4 Accessory buildings 120 square feet or less, located 3 feet or more but less than 50 feet. When required by the enforcing agency, accessory buildings 120 square feet (11.15 m²) or less and separated from an applicable building on the same lot by a distance of 3 feet (914 mm) or more but less than 50 feet (15 240 mm) shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section 503.2.4.

504.11.5 Miscellaneous structures located 3 feet or more but less than 50 feet. When required by the enforcing agency, miscellaneous structures that require a permit and are separated from an applicable building on the same lot by a distance of 3 feet (914 mm) or more but less than 50 feet (15 240 mm) shall be constructed of noncombustible materials or of ignition-resistant materials as described in Section 503.2.4.

504.11.6 Roof construction. Roof assemblies and roof coverings of accessory buildings required to be constructed entirely of noncombustible materials or of ignition-resistant materials shall comply with Sections 504.2 and 504.2.1.

Attached Files

- **accessory table.jpg**
<https://www.cdpasscess.com/proposal/10556/30799/files/download/4420/>
- **NIST.TN.2205.pdf**
<https://www.cdpasscess.com/proposal/10556/30799/files/download/4412/>
- **2017 fire data.pdf**
<https://www.cdpasscess.com/proposal/10556/30799/files/download/4406/>
- **2022_HE_IBHS_WildfireConstruction reduced.pdf**
<https://www.cdpasscess.com/proposal/10556/30799/files/download/4405/>

Reason: This code change is to propose one construction method for building and structures in the wildland area. This is the companion to another proposal to delete sections 505 and 506 with the intent to remove Ignition Resistant Construction Classes 2 and 3. Replacing these multiple classifications will be a single defined Ignition Resistant Construction as provided by Section 504. As the IWUIC is intended to provide a minimum standard of protection for the Wildland-Urban Interface areas, a single classification of Ignition Resistant Construction should be provided to accomplish the following goals:

1. Protect lives and property within the Wildland-Urban Interface areas
2. Provide clear and consistent standards, simplifying the construction process
3. Provide a minimum standard of protection, with appendices providing potential pathways for increased protection beyond the minimum

Findings during a NIST case study of the 2018 Camp Fire (<https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2135.pdf>) found that a primary factor in fire spread was significant ember exposure. As stated in the case study "In agreement with the other NIST case studies of WUI fires, the Camp Fire has demonstrated that embers can have significant impact on WUI communities. Laboratory and field work by NIST [57] has demonstrated that embers with enough energy to cause ignitions are readily generated from parcel-level combustibles such as landscaping mulch, fences, and firewood piles. These parcel-level fuels can cause ignitions over 40 m (130 ft) downwind. Ember ignitions downwind from parcel-level combustibles enable fire to readily spread from parcel to parcel. In high hazard areas, WUI structures therefore need to be able to withstand the exposures generated from both wildland and parcel-level combustibles." (A Case Study of the Camp Fire, pg.141)

Given the distances that embers can travel, this minimum standard of protection should be across all Wildland-Urban Interface areas; regardless of whether they have been designated as Moderate, High or Extreme hazards. An analysis of California structures damaged by wildfire in 2017 found that more homes were damaged in the areas designated as moderate fire hazard severity (3645 damaged) than those damaged in areas designated as very high fire hazard severity (2215 damaged). Of those damaged, a similar percentage of those structures were recorded as destroyed; 92% of damaged structures being destroyed in moderate fire hazard severity zones, and 86% of damaged structures being destroyed in very high fire hazard severity zones. This data indicates that the requirements proposed in 504 which mirror the California Building Code Chapter 7A requirements are working.

[Construction Costs for a Wildfire Resistant Home, California Edition \(headwaterseconomics.org\)](https://www.headwaterseconomics.org)

The Headwaters Economics study by the Insurance Institute for Business & Home Safety outlines that California's Chapter 7A requirements should be the bare minimum. If there is a proposal for three construction versions, using the proposed code provisions as the minimum with an enhanced version and an optimum version for best performance standards. "In preliminary research conducted by Baylis and Boomhower (2021), the authors examined home survivability factors for nearly 50,000 homes exposed to wildfires between 2007 and 2020 across California. The authors reported that a home built in 2010 or later was nearly 40% less likely to be destroyed by a wildfire compared to a home built in 1985 or before. Home survivability was closely correlated to modern building codes requiring homeowner mitigation measures. Additionally, a home was more likely to survive if its nearest neighbor also complied with recent mitigation regulations resulting in a positive net spillover effect for the larger neighborhood.

Roof - Section 504.2

Roofs are highly vulnerable to ignition due to their relatively large horizontal surface area. The exposure of roof coverings to a range of climatic conditions, including wind, rain, and sun, means the roof covering will require maintenance and eventual replacement. Many

Class A fire-rated roof covering options are available (e.g., asphalt fiberglass composition shingles). A main reason the roof is vulnerable is because the roof edge—including gutters and roof-to-wall intersections where roof covering meets other materials (e.g., siding used in dormers and split-level homes)—is exposed to ember ignitions. These areas must be properly protected by adding additional flashing at roof-to-wall locations.

Under-Eave Area - Sections 504.3 and 504.3.1

Research suggests eaves are extremely important in structure survivability. Eaves play an important role for building design but they also create vulnerabilities and pathways for the building to ignite. Embers can travel through vents in the eave into the attic and accumulate in gaps between blocking and rafters in open-eave construction. Should flames reach the under-eave area, open eaves can also trap heat. Once there is an ignition in the under-eave area, fire will spread laterally more quickly.

Vents in the under-eave area are inlet openings and therefore allow air to enter the attic space. During a wildfire, vent openings can allow the entry of wind-blown embers into the interior attic space. If combustible materials in the attic ignite, the house can burn from the inside out. The importance of ember and flame entry through vents during a wildfire, and as per requirements in Chapter 7A, have resulted in the development of vents designed to resist the intrusion of flames and embers.

Exterior Wall and Wall Covering - Sections 504.5 and 504.5.1

Exterior walls and components in the wall assembly can be vulnerable if exposed to embers, flames, or prolonged exposure to radiant heat from burning items located close to the home. These exposures can ignite combustible siding and the resulting flames can spread vertically and laterally to other wall components such as windows and the under-eave area. Siding extending close to the ground can be vulnerable to ignition by embers accumulating at the base of the wall that ignite it or components in the wall assembly (e.g., wood sheathing). Requirements are included to address the wall assembly itself, along with the exterior wall covering. The wall could be fire resistant, but a combustible exterior wall covering could carry fire up the wall to the eaves and attic.

Attached Deck - Sections 504.7.3 through 504.7.3.4

Similar to a roof, a deck can cover a large horizontal surface area and can be vulnerable to embers and under-deck flame impingement exposures. A burning deck can expose the side of the house to extended radiant heat and/or direct flame contact. The deck walking surface and structural support members, as well as what is stored on or below the deck are therefore important considerations.

Most commonly used deck board products (including wood and plastic composite boards) are combustible. Decks with noncombustible walking surfaces include lightweight concrete or a flagstone product. Regardless of the walking surface, decks are typically supported by solid wood joists, beams, and columns that will be vulnerable to ignition if nearby combustible materials ignite.

Enclosing the under-deck area vertically around the perimeter can minimize the accumulation of vegetative debris, vegetation, and other combustible materials. For enclosed decks, installing vents to ensure that excessive moisture does not accumulate in the under-deck area is critical to avoid moisture-related degradation.

Glazing - Sections 504.8 through 804.8.2

Window manufacturers and suppliers indicated that where dual-pane windows are required to be tempered, most window manufacturers only supply windows with both panes tempered. Other manufacturers will supply what the customer requests, and will only provide one-pane tempered. Since all comparative versions of the wildfire-resistant home are compliant, the price of windows would not result in a significant cost difference.

Doors - Section 504.9

Doors and door frames can fail for the same reasons as windows. Embers can accumulate in the small gaps between the door and frame, resulting in ignition of the door-framing and weather-sealing material.

Vents - Section 504.10 through 504.10.3

Flame- and ember-resistant vents are required to be listed. Currently, only vents in a vertical orientation are listed. Where vents are installed in other than by the OSFM Building Materials Listing Program, will be required for all attic and crawl space vents.

Accessory Structures - Section

The following table helps visualize the resultant requirements.

NIST Technical note 2205 explains how the mitigation of accessory structures help in hardening a building in the wildland area.

<https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2205.pdf>

Bibliography: [Construction costs for a wildfire-resistant home: California edition - Headwaters Economics](#)

[Fire Research Division | NIST](#)

<https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2205.pdf>

Cost Impact: Increase

Estimated Immediate Cost Impact:

Construction costs for a typical single-family (1,750 square-foot) home would increase approximately \$2,000 including developer overhead costs.

Estimated Immediate Cost Impact Justification (methodology and variables):

In 2004, and as a precursor to California adopting Building Code Chapter 7A, the Office of the State Fire Marshal requested an analysis identifying the costs and benefits associated with proposed regulations in the state's wildfire-prone areas. The study was conducted by Fire Cause Analysis and evaluated economic and construction data within various business sectors to analyze construction costs if proposed regulations were implemented.³³ The study found construction costs for a typical single-family (1,750 square-foot) home would increase approximately \$2,000 including developer overhead costs. As an aggregated total at the state level, construction costs would increase approximately \$30 million per year for the estimated 14,000 new homes built in areas where regulations would apply. The authors concluded the costs of not implementing regulations, in the form of property losses and suppression costs, exceeded the projected costs for regulations and therefore recommended adopting mitigation standards in wildfire-prone areas.

In 2019, the National Institute of Building Sciences (NIBS) released a report identifying the benefit-cost ratio (BCR) of investing in hazard mitigation, including wildfires.³⁵ The authors found that for every \$1 spent on up-front costs for wildfire mitigation, a benefit of \$4 was received.

In 2021, the National Research Council of Canada released a study analyzing the benefit-cost ratio for building new construction to comply with the country's wildland urban interface (WUI) Guide.³⁸ In its examination, approximately \$12,000 CAD (~\$9,500 USD) was added to the overall costs for a new, 2,000-square-foot home to meet the provision of Canada's National WUI Guide. The comprehensive report also examined costs for retrofitting existing structures, as well as transferred costs at the community and national scale. Similar to the NIBS study in 2019, the NRC report found an up-front investment in wildfire-resistant construction and vegetation management yielded benefits that exceeded long-term costs and losses.

WUIC54-24

WUIC55-24

IWUIC: SECTION 505, 505.1, 505.2, 505.2.1, 505.3, 505.4, 505.5, 505.6, 505.7, 505.7.1, 505.8, 505.9, 505.10, 505.10.1, 505.10.2, 505.10.3, 505.11, 505.11.1, SECTION 506, 506.1, 506.2, 506.2.1, 506.3, 506.4, 506.5

Proponents: Cary Yballa, Central County Fire Department, Cal FPO (cyballa@ccfd.org); Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov)

2024 International Wildland Urban Interface Code

Delete without substitution:

SECTION 505 **CLASS 2 IGNITION-RESISTANT CONSTRUCTION**

Revise as follows:

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 $\frac{3}{4}$ 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 noncombustible* construction, solid core wood not less than 1³/₄ 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.

Where provided, ventilation openings for enclosed attics, gable ends, ridge ends, under eaves and cornices, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, underfloor ventilation, foundations and crawl spaces, or any other opening intended to permit ventilation, either in a horizontal or vertical surface, shall be in accordance with Section 505.10.1 or Section 505.10.2 to resist building ignition from the intrusion of burning embers and flame through the ventilation openings.

505.10.1 Performance requirements.

Ventilation openings shall be fully covered with listed vents, tested in accordance with ASTM E2886, to demonstrate compliance with all the following requirements:

1. There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.
2. There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.
3. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

505.10.2 Prescriptive requirements.

Where provided, attic ventilation openings, foundation or underfloor vents, or other ventilation openings in vertical or horizontal surfaces 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 1/8 inch (3.2 mm) or shall be designed and approved to prevent flame or ember penetration into the structure.

505.10.3 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.

Delete without substitution:

SECTION 506 CLASS 3 IGNITION-RESISTANT CONSTRUCTION

Revise as follows:

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.~~

506.5 Vents.

~~Where provided, 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 m²) each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch (3.2 mm) or shall be designed and approved to prevent flame or ember penetration into the structure.~~

Reason: This code change is to propose one construction method for building and structures in the wildland area. This is the companion to another proposal to delete sections 505 and 506 with the intent to remove Ignition Resistant Construction Classes II and III. Replacing these classifications will be a single defined Ignition Resistant Construction as provided by Section 504 of this code. As the IWUIC is intended to provide a minimum standard of protection for the Wildland-Urban Interface areas, a single classification of Ignition Resistant Construction should be provided to accomplish the following goals:

1. Protect lives and property within the Wildland-Urban Interface areas
2. Provide clear and consistent standards, simplifying the construction process
3. Providing a minimum standard of protection, with appendices providing potential pathways for increased protection beyond the minimum

Findings during a NIST case study of the 2018 Camp Fire (<https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2135.pdf>) found that a primary factor in fire spread was significant ember exposure. As stated in the case study "In agreement with the other NIST case studies of WUI fires, the Camp Fire has demonstrated that embers can have significant impact on WUI communities. Laboratory and field work by NIST [57] has demonstrated that embers with enough energy to cause ignitions are readily generated from parcel-level combustibles such as landscaping mulch, fences, and firewood piles. These parcel-level fuels can cause ignitions over 40 m (130 ft) downwind. Ember ignitions downwind from parcel-level combustibles enable fire to readily spread from parcel to parcel. In high hazard areas, WUI structures therefore need to be able to withstand the exposures generated from both wildland and parcel-level combustibles." (A Case Study of the Camp Fire, pg.141)

Given that this far distances that embers can travel, this minimum standard of protection should be across the Wildland-Urban Interface areas; regardless of whether they have been designated as Moderate, High or Extreme hazards. In an analysis of California structures damaged by wildfire in 2017 found that of more homes were damaged in the areas designated as moderate fire hazard severity (3645 damaged) than those damaged in areas designated as very high fire hazard severity (2215 damaged). Of those damaged, a similar percentage of those structures were recorded as destroyed. 92% of damaged structures being destroyed in moderate fire hazard severity zones. 86% of damaged structures being destroyed in very high fire hazard severity zones. This data indicates that the requirements proposed in 504 which mirror the California 7A requirements are working.

In an analysis of California structures damaged by wildfire in 2017 found that of more homes were damaged in the areas designated as moderate fire hazard severity (3645 damaged) than those damaged in areas designated as very high fire hazard severity (2215 damaged). Of those damaged, a similar percentage of those structures were recorded as destroyed. 92% of damaged structures being destroyed in moderate fire hazard severity zones. 86% of damaged structures being destroyed in very high fire hazard severity zones.

Whereas the designated fire hazard severity zone did not play a large determining factor in whether a structure was damaged or destroyed, the date of construction did play a large role. In 2017, 33,508 structures that were constructed prior to 2009 were damaged in wildfires. In the same year, only 592 structures that were built after 2009 were damaged or destroyed by wildfire. The year 2009 is significant as it was the first full year that structures build in Wildland-Urban Interface areas were required to comply with California Building Code, Chapter 7A requirements. This data indicates that the requirements proposed in 504 which mirror the California 7A requirements are working.

Construction Costs for a Wildfire Resistant Home, California Edition (headwaterseconomics.org)

The Headwaters Economics study by the Insurance Institute for Business & Home Safety outlines that California's Chapter 7A requirements are a minimum. If there is a proposal for three construction versions, using the proposed code provisions as the minimum with an enhanced version and an optimum version for best performance standards. "In preliminary research conducted by Baylis and Boomhower (2021), the authors examined home survivability factors for nearly 50,000 homes exposed to wildfires between 2007 and 2020 across California.³⁰ The authors reported that a home built in 2010 or later was nearly 40% less likely to be destroyed by a wildfire compared to a home built in 1985 or before. Home survivability was closely correlated to modern building codes requiring homeowner

mitigation measures. Additionally, a home was more likely to survive if its nearest neighbor also complied with recent mitigation regulations resulting in a positive net spillover effect for the larger neighborhood.

Roof

Roofs are highly vulnerable to ignition due to their relatively large horizontal surface area. The exposure of roof coverings to a range of climatic conditions, including wind, rain, and sun, means the roof covering will require maintenance and eventual replacement. Many Class A fire-rated roof covering options are available (e.g., asphalt fiberglass composition shingles). A main reason the roof is vulnerable is because the roof edge—including gutters and roof-to-wall intersections where roof covering meets other materials (e.g., siding used in dormers and split-level homes)—is exposed to ember ignitions. These areas must be properly protected by adding additional flashing to roof-to-wall locations.

Under-Eave Area

Research suggests eaves are extremely important in structure survivability.¹ Eaves play an important role for building design but they also create vulnerabilities and pathways for the building to ignite. Embers can travel through vents in the eave into the attic and accumulate in gaps between blocking and rafters in open-eave construction. Should flames reach the under-eave area, open eaves can also trap heat. Once there is an ignition in the under-eave area, fire will spread laterally more quickly.

Vents in the under-eave area are inlet vents and therefore allow air to enter the attic space. During a wildfire, vent openings can allow the entry of wind-blown embers into the interior attic space. If combustible materials in the attic ignite, the house can burn from the inside out.² The importance of ember and flame entry through vents during a wildfire, and as per requirements in Chapter 7A, have resulted in the development of vents designed to resist the intrusion of flames and embers.

Exterior Wall

Exterior walls and components in the wall assembly can be vulnerable if exposed to embers, flames, or prolonged exposure to radiant heat from burning items located close to the home. These exposures can ignite combustible siding and the resulting flames can spread vertically and laterally to other wall components such as windows and the under-eave area. Siding extending close to the ground can be vulnerable to ignition by embers accumulating at the base of the wall that ignite it or components in the wall assembly (e.g., wood sheathing).

Attached Deck

Similar to a roof, a deck can cover a large horizontal surface area and can be vulnerable to embers and under-deck flame impingement exposures. A burning deck can expose the side of the house to extended radiant heat and/or direct flame contact. The deck walking surface and structural support members, as well as what is stored on or below the deck are therefore important considerations.

Most commonly used deck board products (including wood and plastic composite boards) are combustible. Decks with noncombustible walking surfaces include lightweight concrete or a flagstone product. Regardless of the walking surface, decks are typically supported by solid wood joists, beams, and columns that will be vulnerable to ignition if nearby combustible materials ignite. Enclosing the under-deck area vertically around the perimeter can minimize the accumulation of vegetative debris, vegetation, and other combustible materials. For enclosed decks, installing vents to ensure that excessive moisture does not accumulate in the under-deck area is critical to avoid moisture-related degradation.

Glazing Window manufacturers and suppliers indicated that whereas Chapter 7A only requires one pane in a dual-paned window to be tempered, many window manufacturers only supply windows with both panes tempered. Other manufacturers will supply what the customer requests but will default to one-pane tempered. Since all comparative versions of the wildfire-resistant home are Chapter 7A-compliant, the price of windows would not result in a net cost difference.

Doors

Doors (including window glass set in doors) and door frames can fail for the same reasons as windows. Embers can accumulate in the small gaps between the door and frame, resulting in ignition of the door-framing and weather-sealing material. Vents: Flame- and ember-resistant vents, approved and listed by the OSFM Building Materials Listing Program, will be required for all attic and crawlspace vents. Separation Distance from accessory structures NIST Technical note 2205 explains how the mitigation of accessory structures help in hardening a building in the wildland area.

<https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2205.pdf>

Bibliography: <https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2135.pdf>

Cost Impact: Increase

Estimated Immediate Cost Impact:

Construction costs for a typical single-family (1,750 square-foot) home would increase approximately \$2,000 including developer overhead costs.

Estimated Immediate Cost Impact Justification (methodology and variables):

In 2004, and as a precursor to California adopting Building Code Chapter 7A, the Office of the State Fire Marshal requested an analysis identifying the costs and benefits associated with proposed regulations in the state's wildfire-prone areas. The study was conducted by Fire Cause Analysis and evaluated economic and construction data within various business sectors to analyze construction costs if proposed regulations were implemented.³³ The study found construction costs for a typical single-family (1,750 square-foot) home would increase approximately \$2,000 including developer overhead costs. As an aggregated total at the state level, construction costs would increase approximately \$30 million per year for the estimated 14,000 new homes built in areas where regulations would apply. The authors concluded the costs of not implementing regulations, in the form of property losses and suppression costs, exceeded the projected costs for regulations and therefore recommended adopting mitigation standards in wildfire-prone areas.

In 2019, the National Institute of Building Sciences (NIBS) released a report identifying the benefit-cost ratio (BCR) of investing in hazard mitigation, including wildfires.³⁵ The authors found that for every \$1 spent on up-front costs for wildfire mitigation, a benefit of \$4 was received.

In 2021, the National Research Council of Canada released a study analyzing the benefit-cost ratio for building new construction to comply with the country's wildland urban interface (WUI) Guide.³⁸ In its examination, approximately \$12,000 CAD (~\$9,500 USD) was added to the overall costs for a new, 2,000-square-foot home to meet the provision of Canada's National WUI Guide. The comprehensive report also examined costs for retrofitting existing structures, as well as transferred costs at the community and national scale. Similar to the NIBS study in 2019, the NRC report found an up-front investment in wildfire-resistant construction and vegetation management yielded benefits that exceeded long-term costs and losses.

WUIC56-24

IWUIC: 506.2

Proponents: Marcelo Hirschler, GBH International, GBH International (mmh@gbhint.com); Mark S. Graham, National Roofing Contractors Association (NRCA) (mgraham@nrca.net)

2024 International Wildland Urban Interface Code

Revise as follows:

506.2 Roof assembly.

Roofs shall have a *roof assembly* that complies with not less than a Class ~~A~~ **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*.

Reason: Marcelo Hirschler:

Experience shows that the roof of a building in the WUI area is the most likely area (or perhaps one of the most likely areas) where burning embers can deposit and start a fire that will consume the building. The experience of fires in California, in particular, has shown that fire hardening the roof assembly can make a significant improvement in the probability of a building surviving a wildfire. The California Chapter 7A (the local version of a wildland urban interface code) requires that all roof assemblies in the WUI area meet a Class A rating when tested to ASTM E108 or UL 790 and the IWUIC should do the same. The IWUIC already requires Class A for classes 1 and 2 WUI construction and it should require the same for all WUI areas. The size of the Class B brand in ASTM E108 is 6 inches square by 2 1/4 inches thick Douglas fir wood, weighing approximately 500 g (1.1 lb), with a gas flame applied for 4 minutes. That is unlikely to be sufficient to ensure fire safety for a roof (and the corresponding structure) from a wildfire, since each individual burning brand can be up to 7 square inches in area and weigh several grams, and a wildfire generates large numbers of burning brands.

The attached publication by researchers at NIST (namely "Role of Firebrand Combustion in Large Outdoor Fire Spread", by S. Manzello, S. Suzuki, M. Gollner and C. Fernandez-Pello, from Prog Energy Combust Sci. 2020 ; 76: .

doi:10.1016/j.pecs.2019.100801.) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7047831/pdf/nihms-1548454.pdf>) discusses the sizes and masses of firebrands in actual wildfires.

ASTM E108 explains as follows for the 3 classes of roof exposures:

Class A Tests are applicable to roof coverings that are expected to be effective against severe fire exposure, afford a high degree of fire protection to the roof deck, do not slip from position, and are not expected to present a flying brand hazard.

Class B Tests are applicable to roof coverings that are expected to be effective against moderate fire exposure, afford a moderate degree of fire protection to the roof deck, do not slip from position, and are not expected to present a flying brand hazard.

Class C Tests are applicable to roof coverings that are effective against light fire exposure, afford a light degree of fire protection to the roof deck, do not slip from position, and are not expected to present a flying brand hazard.

Mark Graham:

This code change proposal proposes to increase the required fire classification for roof coverings for Section 506-Class 3 Ignition-Resistant Construction from Class B to Class A. Section 504-Class 1 Ignition-Resistant Construction and Section 505-Class 2 Ignition-Resistant Construction already require roof coverings to be Class A. Changing the roof covering requirement for Class 3 Ignition-Resistant Construction will simplify interpretation and enforcement, and enhance resistance to spread of flame on roof coverings.

Cost Impact: Increase

Estimated Immediate Cost Impact:

Marcelo Hirschler:

The cost of a Class A fire rated roof assembly will be higher than the cost of a Class B fire rated roof assembly, but there will be less danger of destruction in case of a wildfire.

Mark Graham:

\$0 - This code change proposal will have no cost impact for most roof coverings. The U.S. roofing industry already has tens of thousands of different ASTM E108 or UL 790 Class A roof coverings that are regularly designed and installed. In most instances designers already specify Class A roof coverings, whether or not they are required by the code. As an example, the U.S. product standard for asphalt shingles, ASTM D3462, "Standard Specification for Asphalt Shingles made from Glass Felt and Surfaced with Mineral Granules," which is a requirement for asphalt shingles in IBC and IRC, has a Class A minimum requirement; Class B or C asphalt shingles are no longer produced and are not permitted.

In those rare situations where a particular roof covering is a Class B, lower cost Class A roof coverings are readily available.

Estimated Immediate Cost Impact Justification (methodology and variables):

Marcelo Hirschler:

I cannot assess the difference in price between the various fire classified roof assemblies. It is known that virtually all asphalt roofing assemblies are already Class A. In the case of metal roofing assemblies, a membrane would have to be placed underneath the metal (to avoid heat transmission) and this may affect cost. In fact, other than some metal-covered roof assemblies, it is likely that most roof assemblies in the market that are not constructed of wood will actually be Class A.

WUIC56-24

WUIC57-24

IWUIC: 507.1

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov); Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

2024 International Wildland Urban Interface Code

Revise as follows:

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 Sections 503-504.2 and 504.21.~~ All repairs or maintenance of a roof covering with a Class A fire classification shall be accomplished to maintain the Class A fire classification.

Reason: Fire-resistance of the roof construction, by overwhelming consensus, is recognized as the “Achilles Heel” when protecting structures from wildfires. All new construction must meet a Class A fire classification in accordance with Section 504.2. This proposal addresses 3 scenarios where the roof covering must comply with a Class A fire classification.

Existing structures often have a lesser degree of fire classification than Class A. When these existing roofs are replaced, they must be replaced with a roof covering with a Class A fire classification. When a repair occurs that is 25% or more of the roof area, the entire roof covering must be replaced and it must meet a Class A fire classification. When an existing structure has a roof covering with a Class A fire classification, any repair or maintenance must be done to maintain the Class A rating. This last scenario applies even if the roof area repaired is less than 25%.

Cost Impact: Increase

Estimated Immediate Cost Impact:

\$0 or nominal cost increase.

Estimated Immediate Cost Impact Justification (methodology and variables):

Now with the increased production of rated roof assemblies that cost is no longer a controlling factor. It was determined that there was little to no cost difference for the change.

WUIC57-24

WUIC58-24

IWUIC: 507.1

Proponents: Mark S. Graham, National Roofing Contractors Association (NRCA) (mgraham@nrca.net)

2024 International Wildland Urban Interface Code

Revise as follows:

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.

Reason: This code change proposal is intended to clarify IWUIC's requirements regarding roof covering replacement and bring consistency with what is already included in IBC and IRC. IWUIC's current language on roof replacements includes the "25 percent rule," which was included in two of the legacy codes at one point, but has not been included in the IBC or IRC. Striking the 25 percent rule from IWUIC's Section 507.1-General will make IWUIC's requirements for roof covering replacement consistent with those of IBC and IRC.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal coordinates IWUIC's requirements for roof covering replacement with those already contained in IBC and IRC. There are no changes in the codes stringency.

WUIC58-24

WUIC59-24

IWUIC: 602.1

Proponents: Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

2024 International Wildland Urban Interface Code

Revise as follows:

602.1 General.

An *approved* automatic sprinkler system shall be installed in all occupancies in new buildings required to meet the requirements for Class 1 ignition-resistant construction in Chapter 5. The installation and maintenance of the automatic sprinkler systems shall be in accordance with ~~nationally recognized standards~~ the *International Building Code* or *International Residential Code*, as applicable.

Reason: This section was written before the IRC contained references to sprinkler design standards and the IBC did not reference NFPA 13D. Changes in both codes now allow for the referenced code to be the IBC or the IRC. The appropriate code will be the code the building is constructed under. The IFC is not referenced since it does the sprinkler criteria in the IFC does not apply to dwellings, but the IBC contains the same requirements as the IFC. In this fashion, the section now refers to the applicable construction code.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal does not change the code application or provide new requirements. It clarifies the reference to the specific construction code, which includes the reference to the appropriate sprinkler standards.

WUIC59-24

WUIC60-24

IWUIC: SECTION 603, 603.1, 603.2, TABLE 603.2, FIGURE 603.2, 603.2.1, 603.2.2, 603.2.3, 603.1 (New), 603.2 (New), 603.3 (New), 603.3.1 (New), 603.4 (New), 603.4.1 (New), 603.4.2 (New), 603.4.2.1 (New)

Proponents: Cary Yballa, Central County Fire Department, Cal FPO (cyballa@ccfd.org); Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov)

2024 International Wildland Urban Interface Code

Revise as follows:

SECTION 603 DEFENSIBLE SPACE VEGETATION PLAN

603.1 Objective. Provisions of this section are intended to modify the fuel load in areas adjacent to structures to create a *defensible space*

603.2 Fuel modification.

Buildings or structures, constructed in compliance with the conforming *defensible space* category of Table 503.1, shall comply with the *fuel modification* distances contained in Table 603.2. For all other purposes the *fuel modification* distance shall be not less than 30 feet (9144 mm) or to the lot line, whichever is less. Distances specified in Table 603.2 shall be measured on a horizontal plane from the perimeter or projection of the building or structure as shown in Figure 603.2. Distances specified in Table 603.2 are allowed to be increased by the *code official* because of a site specific analysis based on local conditions and the *fire protection plan*.

TABLE 603.2 REQUIRED DEFENSIBLE SPACE

WILDLAND-URBAN INTERFACE AREA	FUEL MODIFICATION DISTANCE (feet) ^a
Moderate hazard	30
High hazard	50
Extreme hazard	100

For SI: 1 foot = 304.8 mm.

- a. Distances are allowed to be increased due to site specific analysis based on local conditions and the *fire protection plan*.

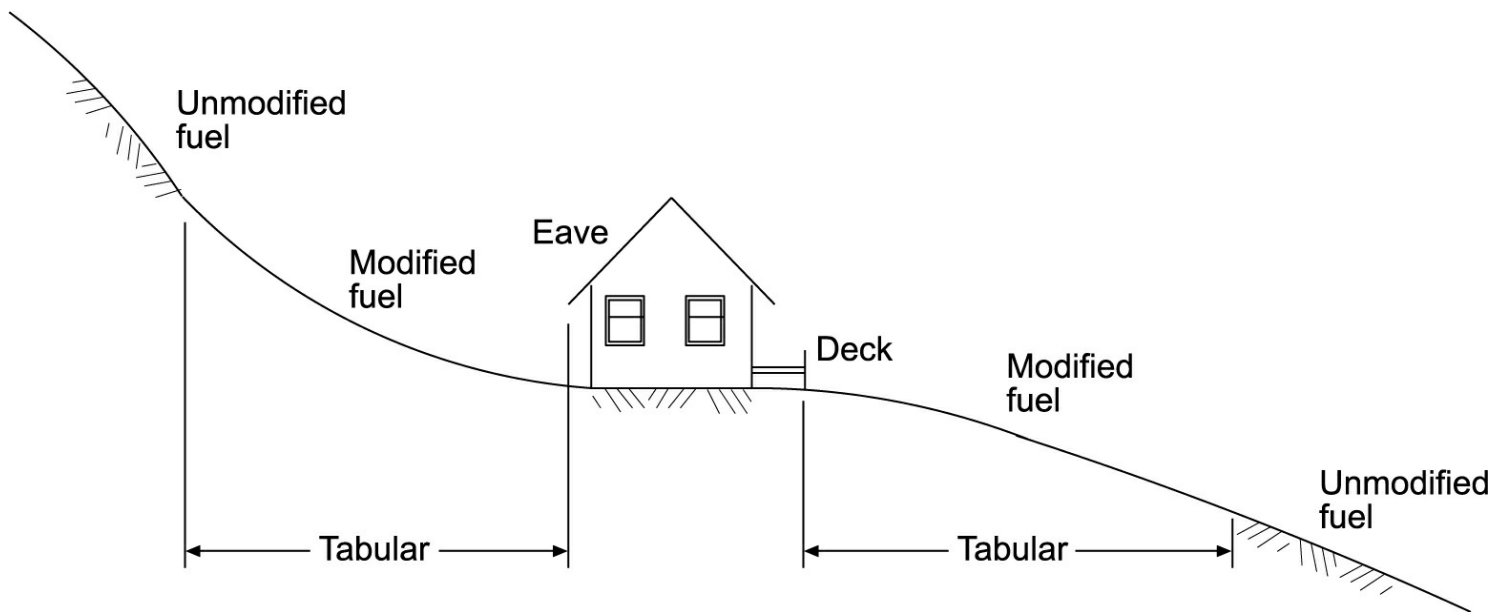


FIGURE 603.2 MEASUREMENTS OF FUEL MODIFICATION DISTANCE

603.2.1 Responsible party. Persons owning, leasing, controlling, operating or maintaining buildings or structures requiring *defensible spaces* are responsible for modifying or removing nonfire-resistant vegetation on the property owned, leased or controlled by said person.

603.2.2 Trees. Trees are allowed within the *defensible space*, provided that the horizontal distance between crowns of adjacent trees and crowns of trees and structures, overhead electrical facilities or unmodified fuel is not less than 10 feet (3048 mm).

603.2.3 Ground cover.

Deadwood and litter shall be regularly removed from trees. Where ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants are used as ground cover, they are allowed to be within the designated *defensible space*, provided that they do not form a means of transmitting fire from the native growth to any structure.

Add new text as follows:

603.1 General. Planting of vegetation for new landscaping shall be selected to reduce vegetation in proximity to a structure and to maintain vegetation as it matures.

603.2 Application. All new plantings of vegetation in designated Wildland-Urban Interface areas shall comply with Sections 603.3 through 603.4.2.1.

603.3 Landscape plans. Landscape plans shall be provided when required by the enforcing agency. The landscape plan shall include development and maintenance requirements for the vegetation management zone adjacent to structures and roadways, and to provide significant fire hazard reduction benefits for public and firefighting safety.

603.3.1 Contents. In addition to the construction site plan as outlined in the International Building Code landscape plans shall contain the following:

1. Delineation of the 30-foot (9144 mm) and 100-foot (3048 mm) fuel management zones from all structures.
2. Identification of existing vegetation to remain and proposed new vegetation.
3. Identification of irrigated areas.
4. A plant legend with both botanical and common names, and identification of all plant material symbols.
5. Identification of ground coverings within the 30-foot (9144 mm) zone.

603.4 Vegetation. All new vegetation shall be fire-smart vegetation in accordance with this section.

Exception: Trees classified as fire-smart vegetation complying with Section 603.4.2.1.

To be considered fire-smart vegetation, it must meet at least one of the following:

1. Be identified as fire-smart vegetation in an approved book, journal or listing from an approved organization.
2. Be identified as fire-smart vegetation by a licensed landscape architect with supporting justification.
3. Plants considered fire-smart vegetation and approved by the local enforcing agency.

603.4.1 Shrubs. All new plantings of shrubs shall comply with the following:

1. Shrubs shall not exceed 6 feet (1829 mm) in height.
2. Groupings of shrubs are limited to a maximum aggregate diameter of 10 feet (3048 mm).
3. Shrub groupings shall be separated from other groupings a minimum of 15 feet (4572 mm).
4. Shrub groupings shall be separated from structures a minimum of 30 feet (9144 mm).
5. Where shrubs are located below or within a tree's drip line, the lowest tree branch shall be a minimum of three times the height of the understory shrubs or 10 feet (3048 mm), whichever is greater.

603.4.2 Trees. Trees shall be managed as follows within the 30-foot zone (9144 mm) of a structure:

1. New trees shall be planted and maintained so that the tree's drip line at maturity is a minimum of 10 feet (3048 mm) from any combustible structure.
2. The horizontal distance between crowns of new trees and crowns of adjacent trees shall not be less than 10 feet (3048 mm).
3. Existing trees shall be trimmed to provide a minimum separation of 10 feet (3048 mm) away from chimney and stovepipe outlets

603.4.2.1 Non-fire-smart vegetation. New trees not classified as fire-smart vegetation, such as conifers, palms, pepper trees and eucalyptus species, shall be permitted provided the tree is planted and maintained so that the tree's drip line at maturity is a minimum of 30 feet from any combustible structure.

Exception: New, single specimen trees, planted so that the tree's drip line at maturity is a minimum of 10 feet (3048 mm) from any combustible structure and are well pruned and maintained to not form a means of rapidly transmitting fire from other nearby vegetation to a structure or from a structure to other nearby vegetation or to interrupt the advance of embers toward a structure.

Reason: The proposal to relocate section "Defensible Space" to follow the newly created section titled "Vegetation Plan" focuses on the planting of vegetation for new landscaping and to maintain defensible space for structures within the wildland urban interface areas. Chapter 5 of the Wildland Urban Interface Code requires vegetation management compliance prior to the final approval for building permits issued, this new section will give guidance on how to comply with the vegetation plan compliance when new landscaping is planted in these areas.

This section will apply only to new plantings of vegetation (other than a brief mention of existing trees in section 603.4.2) only in the Wildland Urban Interface area. Existing vegetation management is addressed in the Defensible Space section.

Requirements for landscape plans are laid out in this section. Since many local fire departments manage the Vegetation Plan Compliance requirements through submittals of landscape plans, there is a need for language to spell out the minimum requirements. This section provides these requirements to ensure adequate information is provided on the plans to conduct a plan review. Defensible space and Vegetation Management go hand in hand. Defensible space is based on the location of the structures in relation to the property lines as well as manmade and natural fire breaks. These topographic features are an essential factor in determining the risks of wildfire spread.

It also addresses how to select fire smart vegetation and provide basic information on planting to ensure that as the plantings grow to maturity, they can be maintained per the section for the Defensible Space requirements. Specifically addressed are shrubs and trees. The intention for shrubs is to select fire-smart species and to purposefully plant them in groupings and arrangements that ensure they

create a landscape that can be easily maintained as they grow. Similarly with shrubs, new tree plantings must also be carefully considered. Trees have the added ability to create a pathway that will lead a fire up to the most vulnerable portions of a house (eaves, vents, and roofs), but also considered was the understanding that trees can provide much needed shade and can prevent the “urban heat island” effect.

The existing tree requirements that are briefly mentioned in this section because it will be very likely existing trees will be part of a new landscape plan as property owners landscape their yards.

Unique to the trees section are the requirements for non-fire-smart vegetation. Since so many of the popular varieties of trees may not qualify for fire-smart status, requirements for non-fire-smart vegetation are also found in the trees section. The requirement for non-fire-smart vegetation is to simply plant them further away from structures to mitigate the additional hazard these trees may bring. This subsection allows property owners to have a path of compliance when they have a robust maintenance plan in place. The exception allows for small lots to have some kind of landscaping closer to the structure. The spacing and maintenance are the most important factors. Tree species become secondary when the spacing and maintenance are in compliance.

Cost Impact: Increase

Estimated Immediate Cost Impact:

\$0 or it may increase of the cost of construction dependent upon the landscaping material and vegetation selected to comply with this section.

Estimated Immediate Cost Impact Justification (methodology and variables):

It is a property owners design choices that will determine the cost of landscaping. With many variables of cost per region and area will be driven by the local contractor, supply and demand.

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IWUIC: [A] 106.6, SECTION 202 (New), SECTION 202, 603.2.1, 604.2, 604.3, A102.2, A104.4, A104.7.1, A105.4.2, A106.2, A107.3, APPENDIX F, F101.1, G101.3.1

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

[A] 106.6 Other data and substantiation.

Where required by the *code official*, the plans and specifications shall include classification of fuel loading, fuel model light, medium or heavy, and substantiating data to verify classification of ~~fire-resistant vegetation~~ fire-smart vegetation.

Add new definition as follows:

FIRE-SMART VEGETATION.

Plants, shrubs, trees and other vegetation that exhibit properties, such as high moisture content, little accumulation of dead vegetation and low sap or resin content, that make them less likely to ignite or contribute heat or spread flame in a fire than native vegetation typically found in the region.

Revise as follows:

FUEL MODIFICATION. A method of modifying fuel load by reducing the amount of ~~nonfire-resistant~~ vegetation or altering the type of vegetation to reduce the fuel load.

603.2.1 Responsible party. Persons owning, leasing, controlling, operating or maintaining buildings or structures requiring *defensible spaces* are responsible for modifying or removing ~~nonfire-resistant vegetation~~ other than fire-smart vegetation on the property owned, leased or controlled by said person.

604.2 Modified area.

~~Nonfire-resistant vegetation~~ Vegetation other than fire-smart vegetation or growth shall be kept clear of buildings or structures, in accordance with Section 603, in such a manner as to provide a clear area for fire suppression operations.

604.3 Responsibility. Persons owning, leasing, controlling, operating or maintaining buildings or structures are responsible for maintenance of *defensible spaces*. Maintenance of the *defensible space* shall include modifying or removing ~~nonfire-resistant~~ vegetation other than fire-smart vegetation and keeping leaves, needles and other dead vegetative material regularly removed from roofs of buildings and structures.

A102.2 Clearance of brush or vegetative growth from roadways. The *code official* is authorized to require areas within 10 feet (3048 mm) on each side of portions of fire apparatus access roads and driveways to be cleared of ~~nonfire-resistant vegetation growth~~ other than fire-smart vegetation.

Exception: Single specimens of trees, ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants used as ground cover, provided they do not form a means of readily transmitting fire.

A104.4 Smoking. Where required by the *code official*, signs shall be posted stating NO SMOKING. Persons shall not smoke within 15 feet (4572 mm) of combustible materials or ~~nonfire-resistant~~ vegetation other than fire-smart vegetation.

Exception: Places of habitation or in the boundaries of established smoking areas or campsites as designated by the *code official*.

A104.7.1 General.

Persons shall not build, ignite or maintain any outdoor fire of any kind for any purpose in or on any *wildland-urban interface area*, except by the authority of a written permit from the *code official*.

Exception: Outdoor fires within inhabited premises or designated campsites where such fires are in a permanent barbecue, portable barbecue, outdoor fireplace, incinerator or grill and are not less than 30 feet (9144 mm) from any combustible material or ~~nonfire-resistive vegetation~~ other than fire-smart vegetation.

A105.4.2 Separation. A clear space of not less than 40 feet (12 192 mm) shall be provided between piles. The clear space shall not contain combustible material or nonfire-resistive vegetation.

Revise as follows:

A106.2 Ashes and coals.

Ashes and coals shall not be placed, deposited or dumped in or on *wildland-urban interface areas*.

Exceptions:

1. In the hearth of an established fire pit, camp stove or fireplace.
2. In a noncombustible container with a tightfitting lid, which is kept or maintained in a safe location not less than 10 feet (3048 mm) from ~~nonfire-resistive vegetation or structures~~ and vegetation other than fire-smart vegetation.
3. Where such ashes or coals are buried and covered with 1 foot (305 mm) of mineral earth not less than 25 feet (7620 mm) from ~~nonfire-resistive vegetation or structures~~ and vegetation other than fire-smart vegetation.

A107.3 Fuel modification area. Water storage and pumping facilities shall be provided with a *defensible space* of not less than 30 feet (9144 mm) clear of ~~nonfire-resistive vegetation or growth~~ vegetation other than fire-smart vegetation around ~~and adjacent to~~ such facilities.

Persons owning, controlling, operating or maintaining water storage and pumping systems requiring this *defensible space* are responsible for clearing and removing ~~nonfire-resistive vegetation~~ other than fire-smart vegetation and maintaining the *defensible space* on the property owned, leased or controlled by said person.

APPENDIX F CHARACTERISTICS OF ~~FIRE-RESISTIVE VEGETATION~~ FIRE-SMART VEGETATION

F101.1 Characteristics of ~~fire-resistive vegetation~~ fire-smart vegetation.

All plants will burn under extreme fire weather conditions, such as drought. However, plants burn at different intensities and rates of consumption. ~~Fire-resistive plants burn~~ Fire-smart vegetation burns at a relatively low intensity, slow rates of spread and with short flame lengths. The following are characteristics of ~~fire-resistive vegetation~~ fire-smart vegetation:

1. Growth with little or no accumulation of dead vegetation (either on the ground or standing upright).
2. Non-resinous plants (willow, poplar or tulip trees).
3. Low volume of total vegetation (for example, a grass area as opposed to a forest or shrub-covered land).
4. Plants with high live fuel moisture (plants that contain a large amount of water in comparison to their dry weight).
5. Drought-tolerant plants (deeply rooted plants with thick, heavy leaves).
6. Stands without ladder fuels (plants without small, fine branches and limbs between the ground and the canopy of overtopping shrubs and trees).
7. Plants requiring little maintenance (slow-growing plants that, when maintained, require little care).
8. Plants with woody stems and branches that require prolonged heating to ignite.

G101.3.1 Exterior sprinkler systems.

Currently, there is no nationally accepted standard for the design and installation of exterior fire sprinkler systems. Interior sprinkler systems are regulated by nationally recognized standards that have specific requirements. However, exterior sprinkler systems lack such uniformity. What is generally proposed is a type of sprinkler system, placed on the roofs or eaves of a building, whose primary purpose is to wet down the roof. These types of systems can be activated either manually or automatically. However, the contemporary thought on exterior sprinkler systems is that if the roof classification is of sufficient fire resistance, exterior sprinklers are of little or no value. Another option and alternative with exterior sprinklers is to use them to improve the relative humidity and fuel moisture in the *defensible space*. In

this case, the exterior sprinkler is not used to protect the structure as much as it attempts to alter the fuel situation. However, studies do not support the idea that merely spraying water into the air in the immediate vicinity of a rapidly advancing wildland-urban fire does much good. Clearly, irrigation systems that keep plants healthy and ~~fire-resistant plants~~ fire-smart vegetation that resist convection and radiated heat can accomplish the same purpose.

Reason: The term “fire-resistive vegetation” is a misnomer. All vegetation will burn. The IWUIC already uses the term of “ignition-resistant construction” which is applicable to construction features, not vegetation.

Since there are no fire-resistant plants, the term misleads the code user and can be misapplied. To add clarity and so that the term does not create confusion, “fire-resistive vegetation” is proposed to be replaced with “fire-smart vegetation.” This term is clear and does not imply that imply that the vegetation will not burn.

To assist with the new term, a definition is added which addresses the characteristics that are crucial for fire-smart vegetation. In the definition of “fuel modification”, the term “non-fire-resistive” is intentionally not included because the vegetation that is modified could be fire-smart vegetation or vegetation other than fire-smart vegetation. There are situations where even fire-smart vegetation needs to be modified or trimmed or removed. This revised definition of “fuel modification” means that it applies to all types of vegetation.

NOTE: The proposal to create a new Chapter 7 for all maintenance requirements would delete Section 603.2.1 (Responsible party).

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Bibliography: <https://anrcatalog.ucanr.edu/pdf/8228.pdf>
<https://www.firefree.org/wp-content/uploads/2016/02/Fire-Resistant-Plants.pdf>

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Changing the term of "fire-resistive vegetation" to the more correct term of "fire-smart vegetation" is editorial and has no regulatory impact.

WUIC61-24

WUIC62-24

IWUIC: 603.2.2.1 (New)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Add new text as follows:

603.2.2.1 New Trees. Planting of new trees shall be permitted within the defensible space provided they are separated or planted so that the tree's drip line at maturity is a minimum of 10 feet (3048 mm) from adjacent trees, overhead electrical facilities or unmodified vegetation and combustible structures.

Reason: This proposal addresses basic information on planting of new trees to ensure that as the trees grow to maturity, they can be maintained per defensible space requirements. The intention for new tree plantings must be carefully considered. Trees have the added ability to create a pathway for fire extension to the most vulnerable portions of a structure (eaves, vents, and roofs). The 10 foot minimum gives consideration and understanding that trees can provide much needed shade and can prevent the "urban heat island" effect.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This section merely provides requirements for the type of trees that may be planted in a designated defensible space. There is no increase to the cost of construction.

WUIC62-24

WUIC63-24

IWUIC: 603.2.3.1 (New), 604.3

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Add new text as follows:

603.2.3.1 Combustible mulch. Combustible materials used for mulch shall be prohibited within 5 feet when measured on a horizontal plane from the perimeter or projection of the building or structure as shown in Figure 603.2.

Revise as follows:

604.3 Responsibility. Persons owning, leasing, controlling, operating or maintaining buildings or structures are responsible for maintenance of *defensible spaces*. Maintenance of the *defensible space* shall include modifying or removing nonfire-resistive vegetation and keeping leaves, needles and other dead vegetative material regularly removed from roofs of buildings and structures. Combustible debris including but not limited to deadwood, dead leaves, and pine needles shall be cleared and maintained a minimum of 5 feet when measured on a horizontal plan from the perimeter or projection of the building and structure as shown in Figure 603.2.

Reason: Combustible mulch and combustible debris located within 5 ft of exterior walls and decks are susceptible to potential ignition due to ember accumulation during a wildfire. Clearing this area of combustible debris and mulch plays an important role in reducing the likelihood of ignition. Quarles and Smith (2011) studied the fire behavior of eight different kinds of mulch including composted wood chips, medium pine bark nuggets, pine needles, shredded western red cedar, Tahoe chips, Tahoe chips with fire retardant, single layer Tahoe chips, and shredded rubber. They reported that, “with the exception of the composted wood chips, all of the mulch treatments demonstrated active flaming combustion” and that “shredded rubber, pine needles and shredded western red cedar demonstrated the most hazardous fire behavior” [1]. The fire behavior of surface fuels like mulch markedly changes with wind and slope [2]. As shown in Figures 1, investigations following the Glass Fire (2020) in Napa and Sonoma Counties, California, highlighted this pathway where embers landed in the front yard and ignited the wood mulch. The mulch enabled the fire to make direct flame contact with a hot tub, igniting the hot tub which resulted in the damage to the home.



Figure 1. Example of vegetation in small amounts located in Zone 0 creating a pathway for fire spread: (a) Wood mulch provided a pathway for fire to get close to the building and ignite a hot tub during the Glass Fire (2020) in Napa and Sonoma Counties, California; (b) Ground-level plants during the Glass Fire (2020).

Note the landscape barrier in Figure 1, which separates wood mulch from bare ground surface. There is no visible damage to the building where wood mulch is not against the home. This can also be observed at another home in Figure 2 where the fire stops where the ground cover changes from grass to gravel.



Figure 2. Noncombustible mulch breaks the fuel path in Lahaina wildfire. Photo courtesy Milad Shabanian, IBHS.

Bibliography: [1] Quarles, S. L., & Smith, E. (2011). The Combustibility of Landscape Mulches. U. o. N. C. Extension.

<https://cecentralsierra.ucanr.edu/files/145298.pdf>

[2] Sánchez-Monroy, X., Mell, W., Torres-Arenas, J., & Butler, B. W. (2019). Fire spread upslope: Numerical simulation of laboratory experiments. *Fire Safety Journal*, 108.

[3] Headwaters Economics and Insurance Institute for Business & Home Safety, 2022, Construction costs for a wildfire-resistant home, California Edition. https://headwaterseconomics.org/wp-content/uploads/2022_HE_IBHS_WildfireConstruction.pdf

Cost Impact: Increase

Estimated Immediate Cost Impact:

This modification to the code will not increase or decrease the construction costs. However it could either raise or lower the maintenance expenses. If combustible mulch is eliminated and the ground cover is exposed soil, the removal of combustible mulch will lead to a cost reduction. The maintenance costs will only rise in locations where less expensive combustible mulch is replaced with pricier noncombustible hardscaping materials such as river rocks.

Estimated Immediate Cost Impact Justification (methodology and variables):

According to a recent cost study conducted by IBHS and Headwaters Economics for a wildfire resistant home in California [3], one-foot-long bark mulch with depth of three inches and 5 feet width cost \$520 while same amount of pea gravel will cost \$2790.

Estimated Life Cycle Cost Impact:

Although there is an initial rise in maintenance expenses when substituting bark mulch with pea gravel, over the long term, pea gravel proves to be more cost-effective. This is due to the consideration of the necessity for regularly reapplying bark mulch, while pea gravel offers a maintenance-free advantage as a noncombustible mulch, making it more economical after six years.

WUIC63-24

WUIC64-24

IWUIC: 603.2.4 (New)

Proponents: Milad Shabaniyan, Insurance Institute for Business & Home Safety (mshabaniyan@ibhs.org); T. Eric Stafford, Insurance Institute for Business and Home Safety (testafford@charter.net)

2024 International Wildland Urban Interface Code

Add new text as follows:

603.2.4 Fences. Fences located within 5 feet of a building with habitable space shall be constructed with approved noncombustible materials.

Reason: This proposal intends to reduce the possibility of direct flame contact exposure caused by ignition of combustible fences adjacent to the structure. Combustible fences that are in contact with or within 5 feet of the main building can act as a conduit for fire spread. Laboratory experiments and post-event investigations highlight the vulnerability of combustible fences, as illustrated in Figure 1 [1, 2].

Combustible fences create a pathway for fire to reach a residence (Figure 1 a and b). Even for homes featuring noncombustible cladding, flames originating from a burning fence can pose a threat to vulnerable components like eaves, vents, and glazing. As shown in Figure 1c, the installation of a noncombustible fence within Zone 0 disrupts the fire's path to a home [3].



Figure 1. Examples of combustible fencing providing a pathway for fire to the house, damaging the noncombustible siding.

Bibliography:

1. Butler, K., Johnsson, E. L., Maranghides, A., Nazare, S., Fernandez, M. G., McIntyre, R., Saar, W., Zarzecki, M., Tang, W., & Auth, E. (2022). Wind-Driven Fire Spread to a Structure from Fences and Mulch (NIST Technical Note 2228). National Institute of Standards and Technology. <https://doi.org/10.6028/NIST.TN.2228>
2. Insurance Institute for Business & Home Safety. (2020). California Wildfires of 2017 and 2018. https://ibhs.org/wp-content/uploads/member_docs/camp-fire-report_ibhs-1.pdf
3. Insurance Institute for Business & Home Safety. (2023). Wildfire Prepared Home Sacramento Demonstration, <https://ibhs.org/ibhs-wildfire-prepared-home-demo-sacramento-ca/>
4. Headwaters Economics and Insurance Institute for Business & Home Safety, 2022, Construction costs for a wildfire-resistant home, California Edition. https://headwaterseconomics.org/wp-content/uploads/2022_HE_IBHS_WildfireConstruction.pdf

Cost Impact: Increase

Estimated Immediate Cost Impact:

This modification can increase the construction cost. According to the cost study analysis performed by IBHS and Headwaters Economics in 2022, replacing 5 ft of cedar fence with a metal fence can increase the construction cost around \$200 in California [4].

Estimated Immediate Cost Impact Justification (methodology and variables):

According to the cost study analysis performed by IBHS and Headwaters Economics in 2022, replacing 5 ft of cedar fence with a metal fence can increase the construction cost around \$200 in California [4].

WUIC64-24

WUIC65-24

IWUIC: 604.1, 604.5 (New)

Proponents: Cary Yballa, Central County Fire Department, Cal FPO (cyballa@ccfd.org); Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov)

2024 International Wildland Urban Interface Code

Revise as follows:

604.1 General.

~~Defensible spaces required by Section 603 shall be maintained in accordance with Section 604. Hazardous vegetation and fuels shall be managed to reduce the severity of potential exterior wildfire exposure to buildings and to reduce the risk of fire spreading to buildings.~~

Add new text as follows:

604.5 Disposal of flammable vegetation and fuels. The disposal, including burning or removal to a site approved by the local jurisdiction, in consultation with the fire authority, of flammable vegetation and fuels removed from the site as a result of building construction, road or driveway construction or vegetation management shall be in accordance with all applicable laws and regulations.

Reason: This proposal clarifies that maintenance of the vegetation in the defensible space is required for all buildings.

It also adds Section 604.5 which addresses the disposal of fuels or debris resulting from clearing land for construction or annual vegetation maintenance.

This section allows for the material to be disposed of or burned provided the burning is in accordance with all regulations.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is for clarification of the methods of handling vegetation maintenance and disposal of the resultant debris.

WUIC65-24

WUIC66-24

IWUIC: 604.3

Proponents: Matthew Dobson, VSI, VSI (mdobson@vinylsiding.org)

2024 International Wildland Urban Interface Code

Revise as follows:

604.3 Responsibility. Persons owning, leasing, controlling, operating or maintaining buildings or structures are responsible for maintenance of *defensible spaces*. Maintenance of the *defensible space* shall include modifying or removing nonfire-resistive vegetation combustible mulch, and keeping leaves, needles, and other dead vegetative material regularly removed from roofs of buildings and structures.

Reason: Over the past code cycles there has been concern over smoker habits and wildfires and combustible mulch, and the potential hazard they pose with combustion of exterior walls. This change focuses on providing protections from two ignition sources discarded cigarettes or pre-rolls (joints) and wildfires. Many fire service members, the UL fire fighter safety institute, and other material stakeholders, like the Vinyl Siding Institute, have been focused on this issue over close to 10 years or more. The problem identified is the spread of fire from the exterior into the unprotected attic space and then spreading quickly to other parts of the building either through discarded cigarettes or wildfire. Note that the term "combustible ground cover" could lead to misinterpretation associated with temporary materials placed on the ground during repairs or upgrades and they should not be regulated.

Over the decade, fire departments in the Washington, DC region (Loudon County, VA) have been confronted with structure fires which have demonstrated a consistent pattern of starting on the outside. These fires have the potential for rapid loss of structural integrity and catastrophic collapse before occupants are alerted. As attention has grown locally, it is apparent that this type of fire is becoming common on a national basis.

These fires tend to follow a distinct pattern. These fires start at a low point on the exterior ground or in a waste basket with discarded cigarette and spread vertically along the exterior wall producing flammable gases, which are readily admitted into the attic area through ventilation soffits. If not cooled, these heated gases accumulate and combust, creating rapidly spreading fire conditions in the attic area, often without occupant awareness. The unchecked fire can result in full roof involvement, creating a dangerous and difficult situation for occupants and fire fighters.

The group examined a number of structure fires which have exhibited the pattern described above. There is agreement over 3 common aspects. First, these fires often result from careless smoking habits or wildfires. Second, when the smoking materials are not properly disposed of, they come into contact with combustible ground cover adjacent to a building and, very commonly, this is mulch or wildfires (flying embers) start the combustible ground cover (kindling). And, last, the combustible exterior wall is a factor in the the growth of these fires into the attic space.

The careless smoker is an impediment to effective fire prevention efforts. The fire service has consistently provided data that shows smoking is the leading cause of fatal fires in the United States. Public fire and life safety efforts have been reasonably effective at communicating the message to not smoke in bed, and various medical organizations have demonstrated the health risk associated with "second hand" smoke. We now see that people are routinely smoking outside, at or near the entrance to a building, which increases the possibility of an accidental ignition of outside combustibles.

If one were to chronicle the actions of today's smoker, it shows the last action they take when exiting a building is to "light up." When returning inside, they often drop the cigarette near the entrance. Many smokers seem to believe that dropping a match or cigarette onto the combustible ground cover or into a flower pot is an effective method of extinguishment, however, this behavior often places the smoking material directly into the mulch, initiating the low fire described earlier.

Combustible ground cover (mulch) has become a common exterior decorative material which aids in suppressing weed growth while enhancing a building's curb appeal. However, most mulch is a dead organic material, comprised of chipped wood, tree bark or pine needles. Mulch is most effective when it is maintained in a moist state, however it can dry out very quickly and become a readily ignitable fuel source. Because of its relatively small mass in comparison to its surface area, when ignited, it will progress and sustain open flame.

The group discussed a method in which to proceed, the interest being to add res, in the quickest manner, industrial and social changes which could reduce the possibility of a fire on the outside of a building. Each aspect presents unique challenges for fire prevention efforts:

1. Changing the behavior of the smoker is an ongoing and difficult challenge, especially as social pressures have resulted in regulatory changes to require people to smoke outside of a building. Further development of the “fire safe” cigarette, by way of testing using mulch, could be deemed too costly for the industry, and would have no effect on improper disposal of matches. Thus, the quickest and most practical strategy for this aspect of the problem is to expand public fire and life safety education to focus on the hazards of improper disposal of smoking materials, coupled with enforcement of applicable requirements for regulation of smoking and disposal of products. However, in this age of “information overflow” it is questionable if this would result in widespread behavioral changes for smokers.

2. Regulating the use and placement of mulch, that the study group believes could have the quickest and most significant impact toward reducing the exterior fire problem, while additional strategies to address the other problems noted are pursued. The use of wood and wood related mulch for building decoration is purely optional. It is not a required construction component under current building codes. Therefore, regulations to curtail its use or require that it be separated from a building’s combustible exterior are reasonable and could be codified on a national basis. On a large scale, the mere action of creating separation of combustible materials has been a wildland fire tactic for years. Several states and local jurisdictions have already employed this theory by either recommending or requiring that wood-based mulch be separated from exterior combustible walls:

1. The Virginia Department of Forestry recommends to “provide a minimum of an 18 inch clearance between landscaping mulch beds and combustible building materials” and to “ensure proper clearance to electric devices, such as decorative lights, by following the manufacturer’s instructions;”

2. In Raleigh, NC, following a disastrous fire in a multi-family building, the city passed a pine straw mulch ordinance that bans the use of pine straw as ground cover within 10 feet of multi-family dwellings. The ordinance exempts 1 and 2-family dwellings, however, the city strongly encourages these homeowners to comply with the pine straw restrictions;

3. The Commonwealth of Massachusetts prohibits the new application of mulch within 18 inches around combustible exteriors of buildings, such as wood or vinyl but not brick or concrete. Residential buildings with six units or less are exempted from this regulation, but it is recommended that all homeowners adopt these safety practices. The regulation applies to all other buildings including commercial properties.

4. Ventura County, CA prohibits mulch and wood chips within the required “defensible space” zone (which ranges from 0’ to 30’ from the exterior of a building).

Cost Impact: Increase

Estimated Immediate Cost Impact:

This change could increase the cost of construction and maintenance, as non-combustible mulch can be more expensive than combustible mulch.

Estimated Immediate Cost Impact Justification (methodology and variables):

Typical retail cost of non-combustible mulch (pea gravel) vs. combustible mulch, can range from 2-5 times more expensive.

Estimated Life Cycle Cost Impact:

However typical combustible mulch will need to be replaced every 1-2 years vs. non-combustible mulch which may last 10+ years.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

Based on estimated lifecycle of typical combustible vs. non-combustible mulch.

WUIC67-24

IWUIC: 606.3 (New)

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov); Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

2024 International Wildland Urban Interface Code

Add new text as follows:

606.3 Clear Area. LP-gas installations shall be surrounded by a 10-foot (3048 mm) wide clear area to bare mineral soil. An additional 10 feet (3048 mm) beyond the bare mineral soil is permitted to have vegetation provided it is fire smart vegetation.

Reason: This first part of this requirement is consistent with the International Fire Code for a 10 foot clearance of combustible material around LPG tanks. The second requirement for an additional 10 feet is based on the fact that this LP-gas installation is located in the wildland fire area. The additional 10 feet of fire smart vegetation will provide for a reduce heat impact on the LP-gas components. The term fire smart vegetation is addressed and defined in a separate proposal.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is consistent with requirements that are already contained in the International Fire Code.

WUIC67-24

WUIC68-24

IWUIC: SECTION 608 (New), 608.1 (New), 608.1.1 (New)

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov); Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

2024 International Wildland Urban Interface Code

Add new text as follows:

SECTION 608 **BUILDING SITING AND SETBACKS**

608.1 General. All parcels shall provide a minimum 30-foot (9144 mm) setback for all buildings from property lines and the center of a road, except as provided for in Section 608.1.1.

608.1.1 Setback reduction. A reduction in the minimum setback shall be based upon practical reasons, which may include but are not limited to, parcel dimensions or size; topographic limitations; development density requirements or other development patterns that promote low-carbon emission outcomes; sensitive habitat; or other site constraints, and shall provide for an alternative method to reduce structure-to-structure ignition by incorporating features such as, but not limited to:

1. Non-combustible block walls or fences.
2. Non-combustible material extending 5 feet (1524 mm) horizontally from the furthest extent of the building.
3. Hardscape landscaping.
4. A reduction of exposed windows on the side of the structure with a setback less than 30 feet (9144 mm).

Reason: The principle concept of building setbacks is to maintain fire separation distances from vegetation or other structures. This setback typically exceeds any zoning or building code setback requirement, but is crucial in inhibiting the extension of a wildfire. The NIST Technical Note 2205 evaluates separation distances and supports the 30 foot setback requirements.

Cost Impact: Increase

Estimated Immediate Cost Impact:

It is expected that there will be a \$0 cost in some situations however setbacks may impact the housing density of a subdivision.

A basic representative cost comparison example is as follows:

Residential development with requirement = \$16, 110

Residential development with exception to requirement = \$15, 460

Residential development without requirement = \$12, 890

Estimated Immediate Cost Impact Justification (methodology and variables):

The separation distance benefits the entire wildland community.

WUIC68-24

WUIC69-24

IWUIC: SECTION 609 (New), 609.1 (New), 609.1.1 (New), 609.2 (New), 609.2.1 (New), 609.2.2 (New), 609.2.3 (New), 609.2.4 (New), 609.2.5 (New), 609.2.6 (New)

Proponents: Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov)

2024 International Wildland Urban Interface Code

Add new text as follows:

SECTION 609 **RIDGELINES, FUEL BREAKS AND GREENBELTS**

609.1 Ridgelines. The local jurisdiction shall identify strategic ridgelines, if any, to reduce fire risk and improve fire protection through an assessment of the following factors:

1. Topography.
2. Vegetation.
3. Proximity to any existing or proposed residential, commercial, or industrial land uses.
4. Construction where mass grading may significantly alter the topography resulting in the elimination of ridgeline fire risks.
5. Ability to support effective fire suppression.
6. Other factors, as required by the code official.

609.1.1 Undeveloped ridgelines. Undeveloped ridgelines identified as strategic ridgelines shall be preserved as follows:

1. New buildings on undeveloped strategic ridgelines are prohibited.
 - 1.1. New residential units are prohibited within or at the top of drainages or other topographic features common to ridgelines that act as chimneys to funnel convective heat from wildfires.
 - 1.2. Nothing in this subsection shall be construed to alter the extent to which utility infrastructure, may be constructed on undeveloped ridgelines.
 - 1.3. Where approved, buildings on strategic ridgelines where development activities such as mass grading will significantly alter the topography that results in the elimination of ridgeline fire risks.
2. The code official may implement further specific requirements to preserve undeveloped ridgelines.

609.2 Fuel breaks. When new projects meet any of the following criteria, the code official shall determine the need and location for fuel breaks in consultation with the fire chief:

1. The permitting or approval of three or more new parcels, excluding lot line adjustments.
2. A request for a change of zoning which will increase zoning intensity or density.
3. A request for a change in use permit which will increase the use intensity or density.

609.2.1 Exposures. Fuel breaks required by the code official, in consultation with the fire chief, shall be located, designed and maintained in a condition that reduces the potential of damaging radiant and convective heat or ember exposure to access routes, buildings or infrastructure within the development.

609.2.2 Fire department access. Fuel breaks shall have a minimum of one entry point for fire fighters and fire apparatus. The specific number of entry points and entry requirements shall be determined by the code official, in consultation with the fire chief.

609.2.3 Location of fuel breaks. Fuel breaks may be required at locations such as, but not limited to:

1. Directly adjacent to defensible space to reduce radiant and convective heat exposure and ember impacts, or support fire fighting tactics.
2. Directly adjacent to roads to manage radiant and convective heat exposure and ember impacts, increase evacuation safety, or support fire fighting tactics.
3. Directly adjacent to a hazardous land use to limit the spread of fire from such uses, reduce radiant and convective heat exposure, or support fire fighting tactics.
4. Strategically located along ridgelines, in greenbelts or other locations to reduce radiant and convective heat exposure, ember impacts, or support fire fighting tactics.

609.2.4 Timing. Fuel breaks shall be completed prior to the commencement of any permitted construction.

609.2.5 Construction. Fuel breaks shall be constructed using the most ecologically and site appropriate treatment option, such as, but not limited to, prescribed burning, manual treatment, mechanical treatment, prescribed herbivory and targeted ground application of herbicides.

609.2.6 Maintenance of fuel breaks. Where fuel breaks are required, maintenance mechanisms shall be established to ensure the fire behavior objectives and thresholds are maintained over time.

The mechanisms required shall be binding upon the property for which the fuel break is established, shall ensure adequate maintenance levels, and may include written legal agreements; permanent fees, taxes, or assessments; assessments through a homeowners' association; or other funding mechanisms.

Reason: This proposal introduces the concept of land use planning when it comes to development of buildings and structures in the wildland area.

Ridgeline requirements ensure that minimal visual and environmental impacts of development are associated with building and structures constructed in these areas.

The concept behind fuel breaks is to create a corridor that facilitates firefighter movement during a wildfire. These areas are often where certain wildfire firefighting techniques are employed such as backfires or burn-outs (when fire fighters set their own fire to burn the vegetation in front of an advancing wildfire).

This proposal provides the authority to the code official to designate fire breaks as appropriate to protect developments and assist in fire management.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The benefits of ridgeline and fuel break preservations for the environmental impact out way the costs of construction

WUIC69-24

WUIC70-24

IWUIC: [A] 102.8, CHAPTER 7 (New), SECTION 701 (New), 701.1 (New), SECTION 702 (New), 702.1 (New), SECTION 703 (New), 703.1 (New), SECTION 704 (New), 704.1 (New), 704.2 (New), 704.3 (New), SECTION 705 (New), 705.1 (New), SECTION 706 (New), 404.9, 706.2 (New), SECTION 707 (New), 604.1, 707.1.1 (New), 604.2, 604.3, 604.4, 604.4.1, 604.4.2, 603.2.1, 707.5 (New), 707.6 (New), 707.7 (New), 603.2.3

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Wildland Urban Interface Code

Revise as follows:

[A] 102.8 Existing conditions.

The legal occupancy or use of any structure ~~or condition~~ existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically ~~covered~~ provided for in this code, the International Fire Code or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public. Existing properties shall comply with the defensible space requirements in Section 603 and Chapter 7.

Add new text as follows:

CHAPTER 7 MAINTENANCE REQUIREMENTS

SECTION 701 GENERAL

701.1 Scope. Where a building or structure was constructed in accordance with this code or was previously *approved*, maintenance of new and existing buildings, structures, systems and premises shall comply with this chapter. The construction requirements of this chapter are not intended to apply retroactively.

SECTION 702 IGNITION-RESISTANT CONSTRUCTION

702.1 General. Ignition-resistant construction features found to be damaged, missing or non-compliant shall be repaired or replaced.

SECTION 703 FIRE PROTECTION AND LIFE SAFETY SYSTEMS

703.1 General. *Fire protection and life safety systems* shall be maintained operable at all times in accordance with the applicable standard

SECTION 704 FIRE ACCESS ROADS

704.1 Obstructions. Fire access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Section 403.3 shall be maintained at all times.

704.2 Maintenance. Fire access roads shall be maintained in a condition equal to or better than the condition at the time of approval.

704.3 Signs and marking. Road identification signs required in Section 403.4.1 and marking of fire protection equipment required in

Section 403.5 shall be maintained and legible.

SECTION 705 **PREMISES IDENTIFICATION**

705.1 General. Signs and markings for premise identification required in Section 403.6 shall be maintained and legible.

SECTION 706 **WATER SUPPLY**

Revise as follows:

~~404.9~~706.1 Testing and maintenance**General.** Water sources, draft sites, and hydrants and other fire protection equipment required by this code shall be subject to periodic tests as required by the *code official*. ~~Such equipment installed under the provisions of this code shall be maintained in an operative condition at all times and shall be repaired or replaced where defective. Additions, repairs, alterations and servicing of such fire protection equipment and resources shall be in accordance with approved standards.~~

Add new text as follows:

706.2 Maintenance. Water sources, draft sites and hydrants shall be maintained in an operative condition at all times.

SECTION 707 **DEFENSIBLE SPACE AND VEGETATION MANAGEMENT**

Revise as follows:

~~604.1~~707.1 General.

Defensible spaces required by Section 603 or by an approved vegetation management plan in accordance with 502.2 shall be maintained at all times in accordance with 706.2 through 706.4.2 ~~Section 604.~~

Add new text as follows:

707.1.1 Fire protection plans. Where an *approved fire protection plan* contains *defensible space* requirements other than those in Table 603.2, the *defensible space* requirements in the *approved fire protection plan* shall be maintained at all times.

Revise as follows:

~~604.2~~707.2 Modified area.

Nonfire-resistive vegetation or growth shall be kept clear of buildings or structures, in accordance with Section 603, in such a manner as to provide a clear area for fire suppression operations.

~~604.3~~707.3 Responsibility. Persons owning, leasing, controlling, operating or maintaining buildings or structures are responsible for maintenance of *defensible spaces*. Maintenance of the *defensible space* shall include modifying or removing nonfire-resistive vegetation and keeping leaves, needles and other dead vegetative material regularly removed from roofs of buildings and structures.

~~604.4~~707.4 Trees. Tree crowns extending to within 10 feet (3048 mm) of any structure shall be pruned to maintain a minimum horizontal clearance of 10 feet (3048 mm). Tree crowns within the *defensible space* shall be pruned to remove limbs located less than 6 feet (1829 mm) above the ground surface ~~adjacent to the trees.~~

~~604.4.1~~707.4.1 Chimney clearance. Portions of tree crowns that extend to within 10 feet (3048 mm) of the outlet of a chimney shall be

pruned to maintain a minimum horizontal clearance of 10 feet (3048 mm).

~~604.4.2~~ **707.4.2 Deadwood removed.** Deadwood and ~~litter~~ dying branches shall be regularly removed from trees.

Delete without substitution:

~~603.2.1~~ **Responsible party.** Persons owning, leasing, controlling, operating or maintaining buildings or structures requiring *defensible spaces* are responsible for modifying or removing nonfire-resistive vegetation on the property owned, leased or controlled by said person.

Add new text as follows:

707.5 Accumulation of dead vegetation. Leaves, needles, or other vegetation on roofs, in gutters, on or below decks, porches, balconies or exterior stairways shall be regularly removed.

707.6 Woodpiles. A minimum of 10 feet (3048 mm) clearance to combustible materials shall be maintained in all directions around all exposed woodpiles.

Exception: Where an approved vegetation management plan requires a different clearance distance.

707.7 Liquid Propane Gas (LPG) storage tanks. A minimum of 10 feet clearance to combustible materials shall be maintained in all directions around aboveground Liquid Propane Gas (LPG) storage tanks.

Exception: Where an *approved* vegetation management plan requires a different clearance distance.

Revise as follows:

~~603.2.3~~ **707.8 Ground cover.**

~~Deadwood and litter shall be regularly removed from trees. Where~~ Ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants ~~are used as ground cover, they are allowed~~ shall be permitted to be within the designated *defensible space*, provided that they do not form a means of transmitting fire from the native growth to any structure.

Reason: This proposal accomplishes 3 things:

1. It creates a new Chapter for all maintenance requirements applicable to fire hazard mitigation of structures and premises regulated by the IWUIC. New construction requirements remain in Chapters 4, 5 and 6.
2. It relocates all existing requirements that are maintenance related from Chapter 6 into the appropriate sections of this new Chapter for clarity and easier use of this code.
3. It adds reasonable new requirements for maintenance or repair or replacement of features that were identified by F-CAC as gaps that needed to be addressed.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: Increase

Estimated Immediate Cost Impact:

This proposal does not impose any new or additional cost to initial construction. However, there are new requirements for the maintenance and/or repair of wildfire mitigation measures that are already required for new construction. Maintenance and repair costs are variable and specific cost estimates could vary significantly over the lifespan of a building or property.

Estimated Immediate Cost Impact Justification (methodology and variables):

This proposal will impose additional costs related to ongoing maintenance, repair or replacement of features that were required for initial construction and site approval but do not increase the cost of initial construction.

Estimated Life Cycle Cost Impact:

Maintenance and repair costs are variable and specific cost estimates could vary significantly over the lifespan of a building or property. Costs may necessitate purchase of replacement materials, labor (which could be DIY) and increase as time goes by.

WUIC70-24

WUIC71-24

IWUIC: APPENDIX C, SECTION C101, C101.1, TABLE C101.1, SECTION C101 (New),

C101.1
(New), C101.2 (New), C101.3 (New), C101.4 (New), C101.5 (New), C101.6 (New), C101.7 (New), C101.8 (New), TABLE C101.1 (New)

Proponents: Cary Yballa, Central County Fire Department, Cal FPO (cyballa@ccfd.org); Crystal Sujeski, CAL FIRE/Office of the State Fire Marshal (crystal.sujeski@fire.ca.gov); Darcy Davidson, Carlsbad Fire Department, California Fire Prevention Officers (darcy.davidson@carlsbadca.gov)

2024 International Wildland Urban Interface Code

Revise as follows:

APPENDIX C FIRE HAZARD SEVERITY FORM COMMUNITY WILDLAND-URBAN INTERFACE (WUI) FIRE HAZARD EVALUATION FRAMEWORK

SECTION C101 FIRE HAZARD SEVERITY FORM

C101.1 Fire hazard severity form.

Where adopted, Table C101.1 is permitted to be used as an alternative to Table 502.1 for analyzing the fire hazard severity of building sites.

TABLE C101.1 FIRE HAZARD SEVERITY FORM

A. Subdivision Design Points	
1. Ingress/Egress	
Two or more primary roads	4
One road	3
One-way road in, one-way road out	5
2. Width of Primary Road	
20 feet (6096 mm) or more	4
Less than 20 feet (6096 mm)	3
3. Accessibility	
Road grade 5% or less	4
Road grade more than 5%	3
4. Secondary Road Terminus	
Loop roads, cul-de-sacs with an outside turning radius of 45 feet (13716 mm) or greater	4
Cul-de-sac turnaround	2
Dead-end roads 200 feet (60960 mm) or less in length	3
Dead-end roads greater than 200 feet (60960 mm) in length	5
5. Street Signs	

Present	1
Not present	0
B. Vegetation (IWUIC Definitions)	
1. Fuel Types	
Light	1
Medium	5
Heavy	10
2. Defensible Space	
70% or more of site	1
30% or more, but less than 70% of site	10
Less than 30% of site	20
C. Topography	
0% or less	1
More than 0%, but less than 20%	4
20% or more, but less than 30%	7
30% or more	10
D. Roofing Material	
Class A Fire Rated	1
Class B Fire Rated	5
Class C Fire Rated	10
Nonrated	20
E. Fire Protection — Water Source	
500 GPM (1,892.5 L/min) hydrant within 1,000 feet (304.8 m)	1
Hydrant farther than 1,000 feet (304.8 m) or draft site	2
Water source 20 min. or less, round trip	5
Water source farther than 20 min., and 45 min. or less, round trip	7
Water source farther than 45 min., round trip	10
F. Existing Building Construction Materials	
Noncombustible siding/deck	1
Noncombustible siding/combustible deck	5
Combustible siding and deck	10
G. Utilities (gas and/or electric)	
All underground utilities	1
One underground, one above ground	3

All above ground	5—
Total for Subdivision	
Moderate Hazard	40-59
High Hazard	60-74
Extreme Hazard	75+

Add new text as follows:

SECTION C101

COMMUNITY WUI FIRE HAZARD EVALUATION FRAMEWORK

C101.1

Definitions. The Community WUI Hazard Evaluation Framework presented here is intended for communities as small as a few hundred to tens of thousands of residents. The methodology is not intended for the documentation of single residences or large cities. It is intended to provide a community with an overview of the overall WUI fire-related hazards and to enable the code official to compare the relative hazards and preparedness levels of different communities. The information collected can be used by first responders and community and county officials to prioritize hazard mitigation within and around the community and to develop “tabletop” responses to different WUI fire scenarios. In the event of an actual WUI fire, the information collected could be used by first responders and local officials to safely evacuate civilians, to reduce the risk of first responder injuries and to enhance fire containment. The following are definitions and uses of the different components of Table C101.1 Community WUI Fire Hazard Evaluation Framework. This framework may be expanded to include additional characteristics that are not specifically listed in this preliminary version.

C101.2 Community. In the sense of WUI fire hazard, the community should be viewed in the context of evacuation arteries rather than jurisdictional boundaries. As such, the community may have parts that are incorporated or unincorporated. Community size is reported in acres, and the community boundary selected for this hazard evaluation can be provided for use in a geographic information system (GIS) layer in a number of formats, including but not limited to shapefile, geodatabase or Geo-Package. A topographic overview of the area (community) is used to describe the general conditions using one or more of the following key words: flat terrain, rolling hills, moderate slopes, valleys, steep slopes and/or plateau.

Information about prevailing weather patterns, such as localized winds or significant wind events (strength and direction), should also be included in the community profile.

C101.3 Fuels. The fuels section is intended to provide an overview of the structural, vegetative and other fuels present in the community. This is not a parcel-level assessment; however, if defensible space assessment data is available, it can be aggregated and utilized within this framework to provide higher resolution assessment of community fire hazard. Structure density is a simple metric to capture structure-to-structure spacing and provide insight on the potential structure-to-structure fire spread. For uniform communities, a representative structure separation distance (SSD) may be sufficient, whereas nonuniform communities will be better described using a histogram of SSD. The age of structures may also be a factor in structure vulnerability due to changes in building codes associated with structure hardening. Similarly, a community that was built over a short period of time can be represented by a single value representing the decade of construction, while a community that grew and expanded over long periods will be better represented by a histogram of structure ages.

A database such as LANDFIRE (www.landfire.gov/) can provide the vegetative fuel type and fuel loading throughout the community. This data will be limited by the age of the last LANDFIRE overflight and the 100 feet (30 meters) pixel spatial resolution.

Natural and artificial fuel breaks, including fuel treatments within and around the community, should be represented in a geospatial format and should include the year the vegetative fuel treatment was conducted. Fuel treatments should also include any logging activities in the area surrounding the community. Fire history in and around the community will describe the last time the community experienced direct impacts from fire. Shapefiles of the fuel treatments and fire history will allow for spatial documentation of this data. Fuel treatments and fire history should be documented at least 10 miles (16 km) out from the edge of the community. Local conditions (e.g., fuel, topography, weather, evacuation routes) may require documentation well beyond 10 miles (16 km). The last large fire in the area of the community perimeter, together with the vegetative fuel loading, will provide information on the potential energy content of the

vegetative fuels in the event of a short- or long-term drought.

The documentation of other community hazards, such as hazmat or high fuel load facilities (e.g., fixed propane tanks, hazardous material storage and use facilities, ammunition facilities, lumber yards, pallet storage, tire storage), is important as they can affect civilians and first responder safety during evacuations, fire containment and mop-up activities. The information should be provided in the form of a GIS layer and may then be used by first responders to develop “tabletop” responses for emergency preparedness, and to direct response actions during a WUI fire event.

C101.4 Population. The population of the selected community will impact, among other factors, the minimum time required for evacuation. Population and population density, expressed as the number of residents per acre, are both important metrics that provide information that can be used for evacuation assessment. The permanent to transient population density ratio is intended to capture the fraction of the community that may be visiting for tourism and may not be aware of community evacuation and other fire related activities.

C101.5 Notification. The notification section of the Community WUI Hazard Evaluation is designed to capture the presence and type of mass-notification tools available to emergency managers. It should be noted that reliance on individual notification methods may result in limited notifications. If a Reverse 911 system is in place, the percentage of the community that will potentially receive the notifications from this system will estimate the number of residents that may require different notifications. Sirens or other fixed notification systems with power backup should also be listed in this section along with the fraction of the population covered by these systems. Additional notification systems that don't require phone or internet are also captured in this section, since WUI events frequently result in power outages or other service interruptions.

C101.6 Evacuation. This section of the Community WUI Hazard Evaluation is not intended to replace a full community evacuation study or act as a community evacuation plan. The primary purpose of this section is to compute, given a number of assumptions, a Minimum Throughput Time (MTT), to provide an initial idealized order of magnitude time to be considered in the early stages of evacuation pre-planning. This information can be of value to first responders and community emergency planning personnel, as it may potentially highlight critical evacuation bottlenecks inside or outside the community.

The MTT concept is a traffic engineering calculation of roadway capacity to provide an initial lower bound for planning community evacuation. The MTT is intended for isolated and partly isolated interface and intermix communities rather than a city setting with large populations and complex evacuation routes. A community should consider a detailed evacuation study to further enhance the community evacuation plan. There is a significant body of work associated with developing dynamic evacuation models. An example of a framework which includes coupled fire and evacuation considerations, as well as background on the individual model components, was published in 2019 in Safety Science, Volume 118, authored by Ronchi et al., titled “An open multi-physics framework for modelling WUI fire evacuations,” on pages 868-880.

The MTT considers two significant factors: bottlenecks within and beyond town, and the total number of vehicles that must be accommodated. Bottlenecks slowing traffic throughput may be located within or outside of jurisdictional boundaries. Bottlenecks occurring well beyond the evacuating community may cause ripple effects significantly impacting community evacuation. In identifying the population for computing the MTT, consideration should be given to neighboring settlements/communities that may share the same evacuation route(s). The MTT should consider the minimum number of traffic lanes (i.e., 8 lanes merging into 2 lanes should be treated as 2 lanes) available for evacuation, the community population and the average speed limit of the egress routes. Contraflow, the implementation of reverse direction traffic flow, may be considered here, along with provisions for first responder access to the community. The computed Minimum Throughput Time (MTT) does not account for any of the numerous potential hindrances to evacuation traffic, such as road accidents, reduced speed due to smoke obscuration, merging of traffic in town to feed the primary arteries, large vehicles that occupy more space than cars and have reduced maneuverability, or fire activity impacts, such as burn overs, causing evacuation lane(s) closures and potential slowdowns associated with traffic redirections.

The evacuation section is also used to identify vulnerabilities of egress arteries including vegetative fuel setbacks as well as any hazardous material facilities which might affect evacuation. Fuel setback information, collected in 0.15 miles (0.25 km) increments along egress routes, presented in the form of a histogram and a GIS layer, could help identify vulnerable spots that may potentially impact evacuation and identify candidate locations for fuel treatments.

The presence of a Community Evacuation Plan, the presence and capacity of safety zones and other large crowd assembly areas, and whether evacuation drills are performed will contribute to the community evacuation preparedness overview. The number of hospitals and senior care facilities and their total capacity will provide further information to assess overall community evacuation needs.

C101.7 Infrastructure / COOP / COG. The locations and needs of key facilities for maintaining continuity of operations (COOP) and

continuity of government (COG), such as police, fire, EMS, hospitals, government buildings, cell towers, water sources, water provider infrastructure, electrical utility key infrastructure and natural gas key infrastructure should be listed and incorporated in this part of the evaluation framework.

Infrastructure characteristics, particularly related to water supply and electric utilities, can impact response and potential pre-fire hazard reduction. The public water system dependence on power supply, including the availability of backup power sources (i.e., generator backup) will provide insight into the resilience of the water system. The location of power lines (i.e., above or below ground) can impact evacuation, as downed power lines can impact evacuation and mobility throughout the community.

C101.8 Fire Fighting Response. The type of fire department, whether volunteer, career, or combined, may impact the likely availability and response time of first responder resources. The density of firefighting (ff) responders, as a ratio of the number of personnel on shift to the number of structures (number of ffs/number of structures) will provide information on the maximum possible coverage by the local resources.

In this section, mutual aid resources should be counted only if mutual aid agreements are in place and can ensure rapid deployment. Mutual aid response is captured through a histogram in 1-, 2-, 3- and 4-hour travel times. This may also be approximated using a geographic radius of distance from the community. The purpose of this information is to provide insight into the minimum response times by mutual aid.

TABLE C101.1 COMMUNITY WUI FIRE HAZARD EVALUATION FRAMEWORK

COMMUNITY	DATA TYPE	DATA LAYER IN MDS
Community shapefile, geodatabase or Geo-Package including topography and geographic attributes, and prevailing weather patterns (e.g., wind)	GIS layer	X
FUELS		
Structure Density (structure separation distances—SSD)	SSD histogram	
Age of structures	Histogram	
Vegetative fuel loading	Fuel type	
Fuel type	Tons/acre	
Fuel loading		
Natural and artificial fuel breaks (including fuel treatments within and around community and year built)	List, GIS layer	X
Community hazards (e.g., hazmat and high fuel load facilities)	Specify, GIS layer	X
Fire History	Frequency of, and most recent, fires in/around community	X
POPULATION		
Population	Number, age distribution	
Density	Number/acre	
Permanent/transient ratio	P/T ratio	
NOTIFICATION		
Reverse 911	Opt-in/Opt-out	
Opt-in or Opt-out	Percentage	
Percent of population enrolled in Reverse 911		
Sirens or other notification with power backup	List	
Percent of population within siren coverage range	Percent of population	
Notification dissemination without phone or internet	Y/N	
EVACUATION		
Egress Route Capacity (Minimum Throughput Time)	Time (hours)	
Vulnerability of egress arteries:	Fuel setback data, GIS layer,	X
Fuel setback	Specify, GIS layer	X
Hazmat/high fuel load facilities affecting evacuation		X
Other		
Hospitals and senior care facilities	Specify, number of persons	X
Community evacuation plan	Y/N, specify, GIS layer	X
Safety zones and large crowd assembly areas, capacity	Y/N, specify, GIS layer	X
Evacuation drills	Y/N, specify, GIS layer	X
Community in evacuation route of other communities, through-flow number	Y/N, identify, number	

INFRASTRUCTURE / COOP / COG		
Location and needs of key facilities	List	X
Public water	Y/N	
Dependence on power	Y/N	
Generator backup	Y/N	
Community owned water	Y/N	
Power lines around primary arteries (above ground or below)	Above or Below	X
Critical infrastructure that requires fuel to keep operating	Specify, GIS layer	X
FIRE FIGHTING RESPONSE		
Volunteer vs Career (availability of first responder resources at station)	Volunteer / career / combination	
Density of firefighting (FF) responder to number of structures (FF/structure ratio)	FF/structure	
Mutual aid response (engines-hours histogram) and agreements with mutual aid	Engines-hours histogram	

Reason: The proposed appendix in the Wildland Urban Interface Code is meant to be a tool to enable communities to collect, assemble, and represent the associated risks within the Wildland Urban Interface (WUI) fire area.

Community level fire hazard data is not always readily available in a centralized location and not in a standard format. The proposed framework enables communities' leaders to collect their WUI fire hazard data in an immediately accessible format.

This framework allows the community WUI fire hazard area data to be an inclusive picture. Part of the data assembled in the framework layout will help first responders during an incident. This data may enhance situational awareness, facilitate ingress and egress routes, and increase structure survivability through targeted fire responder actions.

The framework allows decision makers the ability to access WUI fire hazard risks across multiple communities when implemented in this standardized method. For example, a comparison can be made between a community of 5,000 residents to a community with 20,000 residents. They will be able to compare their overall fire hazard as well as the relative fire hazard.

The information from the standardized framework may be used to assist with making design and prioritize resources at the community, county, and state level. These resources may include funding for fuel treatment around communities in designated very high fire hazard severity zones.

The proposed framework has the benefit of enabling communities, county and state to use a methodized approach to assess hazards, offer property solutions and inform first responders before and during incidents.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The cost impact will be varied. Much of the data is already available but may be in many different documents. Pulling the data together will range from zero to "X" amount for a new community starting from scratch. The intent is to be a standard approach for any size community.

WUIC72-24

IWUIC: APPENDIX G, SECTION G101, G101.1, G101.2, G101.3, G101.3.1, G101.3.2, G101.3.3, G101.3.4, G101.3.5, G101.3.6, G101.4, APPENDIX G (New), SECTION G101 (New), G101.1 (New), G101.2 (New), G101.2.1 (New), G101.3 (New), G101.3.1 (New)

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2024 International Wildland Urban Interface Code

Revise as follows:

APPENDIX G SELF-DEFENSE MECHANISM

SECTION G101 GENERAL

G101.1 Identification of the problem.

The *International Wildland Urban Interface Code* establishes a set of minimum standards to reduce the loss of property from wildfire. The purpose of these standards is to prevent wildfire spreading from vegetation to a building. Frequently, proposals are made by property or landowners of buildings located in the wildland-urban interface to consider other options and alternatives instead of meeting these minimum standards. This appendix chapter provides discussion of some elements of the proposed self-defense mechanisms and their role in enhancing the protection of exposed structures.

G101.2 Structural survivability.

Various stages of assault occur as a building is exposed to a wildland-urban fire. Ashes are cast in front of a fire out of a smoke or convection column, which can result in secondary ignitions. Heavier embers that have more body weight and may contain more heat to serve as sources of ignition follow. Finally, the actual intrusion of a flame front and the radiant heat flux can expose combustibles outside of a building and the exterior structure of a building to various levels of radiant heat. A study revealed that the actual exposure of a building to the flame front by the perimeter of the fire was usually less than 6 minutes. However, the exposure to the forms of other materials that can result in proliferation of other ignitions can vary, depending on wind, topography and fuel conditions.

To enhance structural survivability, the self-defense mechanisms must, first, do everything possible to prevent the ignition of materials from objects that are cast in front of the fire and, second, they must withstand the assault of the fire on the structure to prevent flames from penetrating into the building and resulting in an interior fire. There are considerable problems in achieving both of these objectives using some of the proposed alternative forms of protection such as the lack of definitive standards for self-defense mechanisms on the exterior of buildings. Although fire service has done considerable research into the evaluation of technology, such as smoke detectors, fire alarms, and interior sprinkler systems, very limited amount of study has been done on exterior sprinkler systems.

All forms of fire protection are classified as either active or passive. Active fire protection is taking specific action to control the fire in some manner. Passive fire protection uses resistance to ignition or provides some form of warning that allows other action to be taken. These two classifications of self-defense mechanisms create different problems with regard to being accepted as alternatives for building construction. Furthermore, certain self-defense mechanisms must be built in during new construction, and others may only be capable of being added as a retrofit to existing structures. As a matter of public policy, most *code officials* are reluctant to accept passive fire protection as an equivalent to a construction requirement, but are also reluctant to accept active fire protection systems that require intervention by suppression personnel.

The unequal distribution of self-defense mechanisms within a specific neighborhood poses another problem. If an individual is granted a waiver or exemption on the basis of putting in a nonmandated self-defense mechanism, and the neighbors to either side choose not to do so, or are not given the same options, there is a potential operational problem.

G101.3 Alternative concepts.

Sections G101.3.1 through G101.3.6 provide consideration of several alternative self-defense mechanisms.

G101.3.1 Exterior sprinkler systems.

Currently, there is no nationally accepted standard for the design and installation of exterior fire sprinkler systems. Interior sprinkler systems are regulated by nationally recognized standards that have specific requirements. However, exterior sprinkler systems lack such uniformity. What is generally proposed is a type of sprinkler system, placed on the roofs or eaves of a building, whose primary purpose is to wet down the roof. These types of systems can be activated either manually or automatically. However, the contemporary thought on exterior sprinkler systems is that if the roof classification is of sufficient fire resistance, exterior sprinklers are of little or no value. Another option and alternative with exterior sprinklers is to use them to improve the relative humidity and fuel moisture in the *defensible space*. In this case, the exterior sprinkler is not used to protect the structure as much as it attempts to alter the fuel situation. However, studies do not support the idea that merely spraying water into the air in the immediate vicinity of a rapidly advancing wildland-urban fire does much good. Clearly, irrigation systems that keep plants healthy and fire-resistant plants that resist convection and radiated heat can accomplish the same purpose.

G101.3.2 Alternative water supply systems for exposure protection.

Pools and spas are often offered as an alternative water source for fire departments. These water sources must be reliable and able to be accessed to be of any use by fire protection forces. Accessibility means that the fire department must be able to withdraw the water without having to go through extraordinary measures such as knocking down fences or having to set up drafting situations. Designs have been created to put liquid or gas-fueled pumps or gravity valves on pools and spas to allow fire departments to access these water systems. A key vulnerability to the use of these alternative water systems is loss of electrical power. When the reliability of a water system depends on external power sources, it cannot be relied upon by fire fighters to be available in a worst-case scenario.

G101.3.3 Class A foam systems.

One technology is Class A foam devices. These are devices that allow a homeowner to literally coat the exterior of their house with a thick layer of foam that prevents the penetration of embers and radiant heat to the structure. Experiments in various wildland fire agencies advocate foaming houses in advance of fire and flame fronts. To be accepted by the *code official*, the Class A foam system should pass rigorous scrutiny with regard to the manner and needs in which it is activated, the ways and means in which it is properly maintained, and a ways and means to test the system for its operational readiness during hiatus between emergencies.

G101.3.4 Enhanced exterior fire protection.

This alternative method would increase the degree of fire resistance on the exterior of a building. This is most often an alternative recommended as a retroactive application when individual properties cannot achieve adequate *defensible space* on the exterior of a building. Normally, fire resistance and building scenarios are concerned with containing a fire. Fire resistance ratings within building design ensures resistance to a fire for the specified time to compartmentalize the building's interior.

To improve fire resistance on the exterior of the structure, the primary emphasis is on preventing intrusion into the building. This means protection of apertures and openings that may or may not be required to have any degree of fire resistance by accepted building codes. The option that is available here is for individuals to provide coverage in the form of shutters or closures to these areas, which, along with maintenance of combustible-free perimeters, can often prevent intrusion.

There are obvious limitations to this alternative. First and foremost is the means of adequately evaluating the proposed fire resistance of any given assembly. Testing techniques to determine fire resistance for such objects as drywall and other forms of construction may not be applicable to exterior application. Nonetheless, *code officials* should determine the utility of a specific fire resistance proposal by extrapolating conservatively.

G101.3.5 Shelter in place.

Developments in the wildland-urban interface may be designed to allow occupants to "Shelter in place." Use of this design alternative should include ignition-resistant construction, access, water supply, automatic sprinkler systems, provisions for and maintenance of *defensible space*, and a *Fire Protection Plan*.

A *Fire Protection Plan* describes ways to minimize the fire problems created by a specific project or development. The purpose for the *Fire Protection Plan* is to reduce the burden and impact of the project or development on the community's fire protection delivery system. The plan may utilize components of land use, building construction, vegetation management and other design techniques and technologies. It should include specific mitigation measures consistent with the unique problems resulting from the location, topography, geology, flammable vegetation and climate of the proposed site. The plan shall be consistent with this code, and approved by the fire *code official*. The cost of preparation and review is to be borne by the project or development proponent.

G101.3.6 Building location.

The location of a new building within lot lines should be considered as it relates to topography and fire behavior. Buildings located in natural chimneys, such as narrow canyons and saddles, are especially fire prone because winds are funneled into these areas and eddies are created. Buildings located on narrow ridges without setbacks may be subjected to increased flame and convective heat exposure from a fire advancing from below. Stone or masonry walls can act as heat shields and deflect the flames. Swimming pools and rated or noncombustible decks and patios can be used to create a setback, decreasing the exposure to the structure. Attic and under-floor vents, picture windows and sliding glass doors should not face possible corridors due to the increased risk of flame or ember penetration.

G101.4 Conclusion.

The purpose of the *International Wildland-Urban Interface Code* is to establish minimum standards that prevent the loss of structures, even if fire department intervention is absent. To accept alternative self-defense mechanisms, the *code official* must carefully examine whether these devices will be in place at the time of an event and whether they will assist or actually complicate the defense of the structure by fire suppression forces if they are available.

The best alternative to having a building comply with all of the provisions of this code is to remove sources of fuel. This is closely paralleled by excellent housekeeping between the vegetation and the structure. Alternative ways of achieving each of these goals can and should be considered after scrutiny by appropriately credentialed and qualified fire protection personnel.

Add new text as follows:

APPENDIX G VOLUNTARY HOME-HARDENING RECOMMENDATIONS

SECTION G101 GENERAL

G101.1 Identification of the problem. The International Wildland-Urban Interface Code establishes a set of minimum standards to reduce the loss of property from wildfire. The purpose of these standards is to prevent wildfire from spreading from vegetation to a building. Many homes were built in the wildland-urban interface areas prior to the implementation of provisions found in this code. As a result, many homes are lacking in their ability to survive an approaching wildfire. Many of the features discussed herein are designed as low-cost features to retrofit existing homes. Additionally, many owners desire to increase the survivability of their home and provide additional protection beyond the minimums prescribed in this code. This appendix chapter provides discussion of some elements of possible features to enhance survivability and harden the structure against an approaching wildfire.

G101.2 Structural survivability. The home hardening features listed in Section G101.21 were developed as a best practices guide to assist homeowners to increase the ignition-resistance of their homes from wildfires. Some of these items are based on upgrading to more stringent building materials when that building component is due for replacement as part of its normal maintenance or lifespan, such as the roof covering.

G101.2.1 Home hardening features. If homes are not already provided with the suggested protection, the following items should be considered in hardening a home against wildfire:

1. When it is time to replace your roof, replace it with a Class A fire rated roof.
2. Block any spaces between your roof covering and sheathing with noncombustible materials (bird stops).
3. Install a noncombustible gutter cover on gutters to prevent the accumulation of leaves and debris in the gutter.
4. Cover your chimney and stovepipe outlets with a noncombustible corrosion resistant metal mesh screen (spark arrestor), with 3/8-inch to 1/2-inch openings.
5. Install ember and flame-resistant vents.

6. Caulk and plug gaps greater than 1/8-inch around exposed rafters and blocking to prevent ember intrusion into the attic or other enclosed spaces.
7. Inspect exterior siding for dry rot, gaps, cracks, and warping. Caulk or plug gaps greater than 1/8-inch in siding and replace any damaged boards, including those with dry rot
8. Install weather-stripping to fill gaps greater than 1/8-inch between garage doors and door frames to prevent ember intrusion. The weather-stripping must be compliant with UL Standard 10C.
9. When it's time to replace your windows or skylights, replace them with multilayered glazed panels containing at least one tempered pane or dome.
10. When it's time to replace your siding or deck, use compliant noncombustible or ignition-resistant materials.
11. Cover openings to operable skylights with noncombustible metal mesh screen with openings in the screen not to exceed 1/8-inch.
12. Install a minimum 6-inch metal flashing, applied vertically on the exterior of the wall at the deck-to-wall intersection to protect the building siding material.

G101.3 Defensible space features. The maintenance and defensible space features listed in Section G101.31 were developed as a best practices guide to assist homeowners to increase the effectiveness of their defensible space and improve the effects of the home hardening features to increase the survivability of their homes from wildfires.

G101.3.1 Maintenance and defensible space. The following maintenance and operational procedures assist to limit the impact on a home from an approaching wildfire:

1. Regularly clean your roof, gutters, decks, and the base of walls to avoid the accumulation of fallen leaves, needles, and other flammable materials.
2. Ensure that all combustible materials are removed from underneath, on top of, or within five feet of a deck.
3. Remove vegetation or other combustible materials that are within five feet of windows and glass doors.
4. Replace wood mulch products within five feet of all structures with noncombustible products such as dirt, stone, or gravel.
5. Remove all dead or dying grass, plants, shrubs, trees, branches, leaves, weeds, and pine needles within 30 feet of all structures or to the property line.
6. Ensure exposed firewood is stored at least 30 feet away from structures or completely covered in a fire-resistant material that will not allow embers to penetrate. Additionally, make sure you have 10 feet of clearance around your wood piles.
7. Be sure to store combustible outdoor furnishings away from your home when not in use.
8. Remember to properly store retractable awnings and umbrellas when not in use so they do not collect leaves and embers.

Reason: Home hardening is the term used to describe vegetation management compliance and building materials used to resist the intrusion of flames or embers projected by a wildland fire. It can be applied to new construction or for retrofitting an older home. Home Hardening considers the relationship between your home and its exposure to nearby combustible features such as vegetation, vehicles, accessory buildings, or even miscellaneous structures like a fence.

Your roof is one of the most vulnerable areas of your home! Due to its large surface area, your roof is more susceptible to embers and flame.

How is a roof vulnerable?

- Combustible roof coverings such as a non-fire-retardant treated wood shake or shingle roof. California requires roof coverings and assemblies to be [Class A-rated](#)[External Link](#). Common Class A roof coverings include asphalt shingles, tile or cement shingles, or metal panels.
- Gaps or openings in your roof assembly that have degraded exposing unprotected roof components.
- Debris accumulation on your roof, especially when located next to vulnerable areas such as combustible wall intersections.

What to do about a roof

- Keep your roof clear of debris and vegetation.
- Fill in gaps between the roof covering and the sheathing to prevent the intrusion of embers and flame.
- When it is time to replace your roof, install a Class A-rated roof covering such as asphalt fiberglass composition shingles.
- Replace combustible siding at roof-to-wall intersections with noncombustible siding.

How are roof attachments vulnerable?

- Debris accumulation around roof attachments.
- Gaps or penetrations in the roof covering from the installation of a roof attachment like a solar panel.

What to do about roof attachments

- Check periodically and keep areas around roof attachments free of debris.
- Ensure that roof attachments have enough space underneath them so that debris does not accumulate.
- Ensure openable skylights have a noncombustible metal mesh screen not exceeding 1/8 inch and have multipaned glazing with one layer of tempered glass.
- Install metal flashing around exposed wood frame skylights.

Check your gutters! Clean gutters regularly and install noncombustible gutter covers on gutters.

How are gutters vulnerable?

- Gutters without a gutter cover can allow accumulation of debris making it highly susceptible to embers and fire. If the debris catches on fire, it exposes unprotected combustible areas of your roof assembly.
- Gutters made of combustible materials such as vinyl can catch on fire and expose unprotected combustible areas of your roof assembly.

What to do about gutters

- At a minimum, install a noncombustible gutter cover to reduce the buildup of debris. When it is time to replace your gutters, replace them with a non-combustible option such as metal.
- Ensure your roof has a metal drip edge installed that completely covers the space above your gutter system.

Make sure your vents are protected from embers and fire. Upgrade your vents!

How are vents vulnerable?

- Access points such as your attic or crawlspace vents are areas embers or flames can enter and ignite combustible materials inside your home.
- Inlet vent that allows for the entry of wind-blown vegetative debris. Ridge or off-ridge vents located on your roof are more susceptible.
- Vents constructed of flammable materials such as plastic are highly vulnerable to embers and flames.

What to do about vents

- At a minimum, vents should have metal mesh screening that is at least 1/8 inch to protect against embers and flame.
- Upgrade to WUI-rated ember/flame-resistant vents. Be sure to accommodate for proper ventilation. Consult your local building official or licensed contractor for local building requirements for wildland areas.
- Keep debris away from all vents.
- Properly seal all openings including around blocking in vent areas.

Plug gaps or openings in your eaves and remove all vegetation and combustible materials that are directly underneath.

How are eaves vulnerable?

- Open eave construction with gaps or penetrations between the rafter tails and blocking as they are entry points for embers.
- Vents in eaves with gaps or penetrations in the blocking.
- Wide overhangs.
- Combustible fuel sources next to your home that can create a fire pathway for embers or flames to your eaves.

What to do about eaves

- Remove vegetation and combustible materials directly below eaves.
- Create a soffit eave (horizontal) or enclose eave (angled) using noncombustible material. Consult your local building official or licensed contractor for building codes in your area.
- Inspect eaves for gaps around rafter roof tails and blocking. Plug or caulk gaps.

Exterior siding that is combustible, has gaps, holes, or rot is vulnerable to both embers and flame.

How is siding vulnerable?

- If ignited, combustible siding can provide a path for flames to penetrate through other vulnerable areas such as windows, under-eave areas, or vents.
- Siding ignition from nearby combustibles that are too close to the house.
- Roof-to-wall areas where combustible siding is present.
- Gaps or penetrations in the exterior covering that are larger than 1/8 of an inch.

What to do about siding

- Plug or repair all gaps, holes, or rot in your exterior siding.
- Consider replacing combustible siding with a noncombustible or ignition-resistant material option. Consult your local building official or licensed contractor for local building codes in wildland areas.
- If a full replacement of your exterior covering is not possible then consider a partial replacement by using a noncombustible siding material for the bottom 2 feet from the ground and add metal flashing to protect the bottom edge sheathing.

Close the gap! Poorly sealed doors with gaps or penetrations provide a path for embers to enter your home or garage.

How are doors vulnerable?

- Doors that have rot or decay.
- Combustible door framing material as embers tend to accumulate at the bottom thresholds and sides.
- Doors that have gaps or penetrations greater than 1/8 inch.
- Door screens that are not made of metal mesh.
- Fuel sources stored nearby or inside a garage which increases its ignition potential.
- Garage doors that lack gasketing or have gaps that allow for the intrusion of embers.

What to do about doors

- Install or replace non-compliant wood screen or sliding doors with a noncombustible option.
- Install metal mesh screens in sliding or screen doors.
- Relocate combustibles and flammables inside your garage so they are not located next to ignition sources.
- Add metal flashing at garage door jambs and headers.
- Add gasketing (weather-stripping) to garage doors to prevent ember intrusion.

Remove combustibles and vegetation around windows and upgrade older vulnerable single-pane windows with ones designed for areas that experience wildland fire.

How are windows vulnerable?

- Windows that are left open unattended.
- Combustible framing material that, when ignited, glass breaks or falls out providing a path for embers or flames to enter your home.
- Radiant heat which can cause windows to break even before fire reaches the house. Single-pane and large windows are particularly vulnerable.
- Windows that face large vegetation areas or have vegetation directly underneath.
- Vinyl windows that do not have an internal reinforcement bar in the horizontal or vertical separator member as they are prone to failure from radiant exposure due to deformation of the frame.

What to do about windows

- Install or upgrade to double-pane tempered glass windows. Tempered glass is about four times more resistant to breaking during a wildfire.
- Noncombustible metal framing material is an optimal choice.
- Confirm if vinyl windows have a vertical or horizontal reinforcement bar.
- Create a 0 to 5 ember-resistant zone by removing vegetation and other combustibles by all windows.
- Install metal mesh window screens to improve the performance of windows subjected to radiant heat exposure.

Protect your deck! Deck ignitions can start from flames underneath or embers on top.

How is a deck vulnerable?

- Combustible damaged or rotting deck boards as they are more easily ignitable.
- Deck boards made of combustible materials that are attached to the residence.
- Deck-to-wall intersections that have combustible siding and no metal flashing.
- Combustibles within the first 0 to 5 feet zone around a combustible deck (patio furniture, planter boxes, door mats, etc.)
- Combustible items stored underneath your deck that could be an ignition source for fire.
- Decks that overhang a slope that can be exposed to flames from trees or other vegetation downslope.
- Lattice or other combustible fencing options are used as a vertical enclosure under a deck, as it is readily ignitable.

What to do about decks

- Create an ember-resistant zone under the deck footprint extending five feet outward to reduce the likelihood of under-deck flame exposure. Use hardscapes like gravel, pavers, or concrete.
- Ensure sufficient defensible space if your deck is overhanging and located on a slope to minimize flame spread.
- Replace deck boards with ignition-resistant, noncombustible, fire-retardant-treated wood, or material that complies with performance testing standards (this includes steps, stairs, and railings).
- Replace any damaged or rotting deck boards as they ignite more easily.
- Install a minimum of a 6-inch metal flashing applied vertically on the exterior wall and at deck-to-wall intersections.
- If a full replacement of your deck is not possible then consider a partial replacement by replacing the walking surface boards with a noncombustible option for the first 1 ft. away from the residence.
- Remove combustible items stored under your deck.
- Regularly clear debris on top of or underneath your deck.

Bibliography: <https://www.fire.ca.gov/home-hardening>

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The section is voluntary. The cost is determined based on the recommendations to harden an existing structure in the Wildland Urban area.

WUIC73-24

IWUIC: APPENDIX H, SECTION H101, H101.1, FIGURE H101.1(1), FIGURE H101.1(2), FIGURE H101.1(3), FIGURE H101.1(4)

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2024 International Wildland Urban Interface Code

Delete without substitution:

APPENDIX H INTERNATIONAL WILDLAND-URBAN INTERFACE CODE FLOWCHART

SECTION H101 GENERAL

H101.1 Flowchart.

The flowchart shown in Figures H101.1(1) through H101.1(4) is based on the "Decision Tree" concept and is intended to provide the *code official* with a graphical representation of how this code is to be applied.

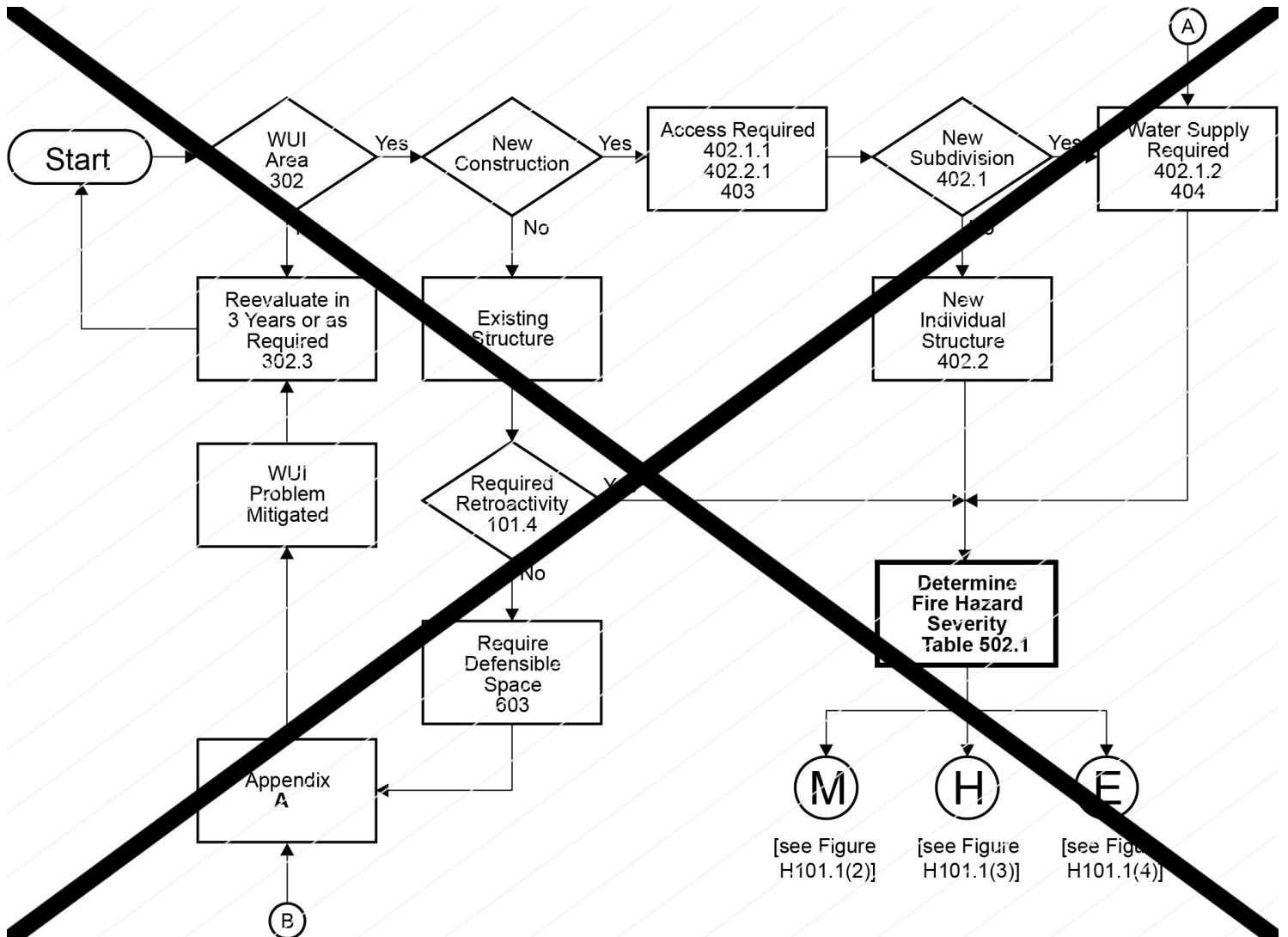


FIGURE H101.1(1) DETERMINATION OF REQUIREMENTS

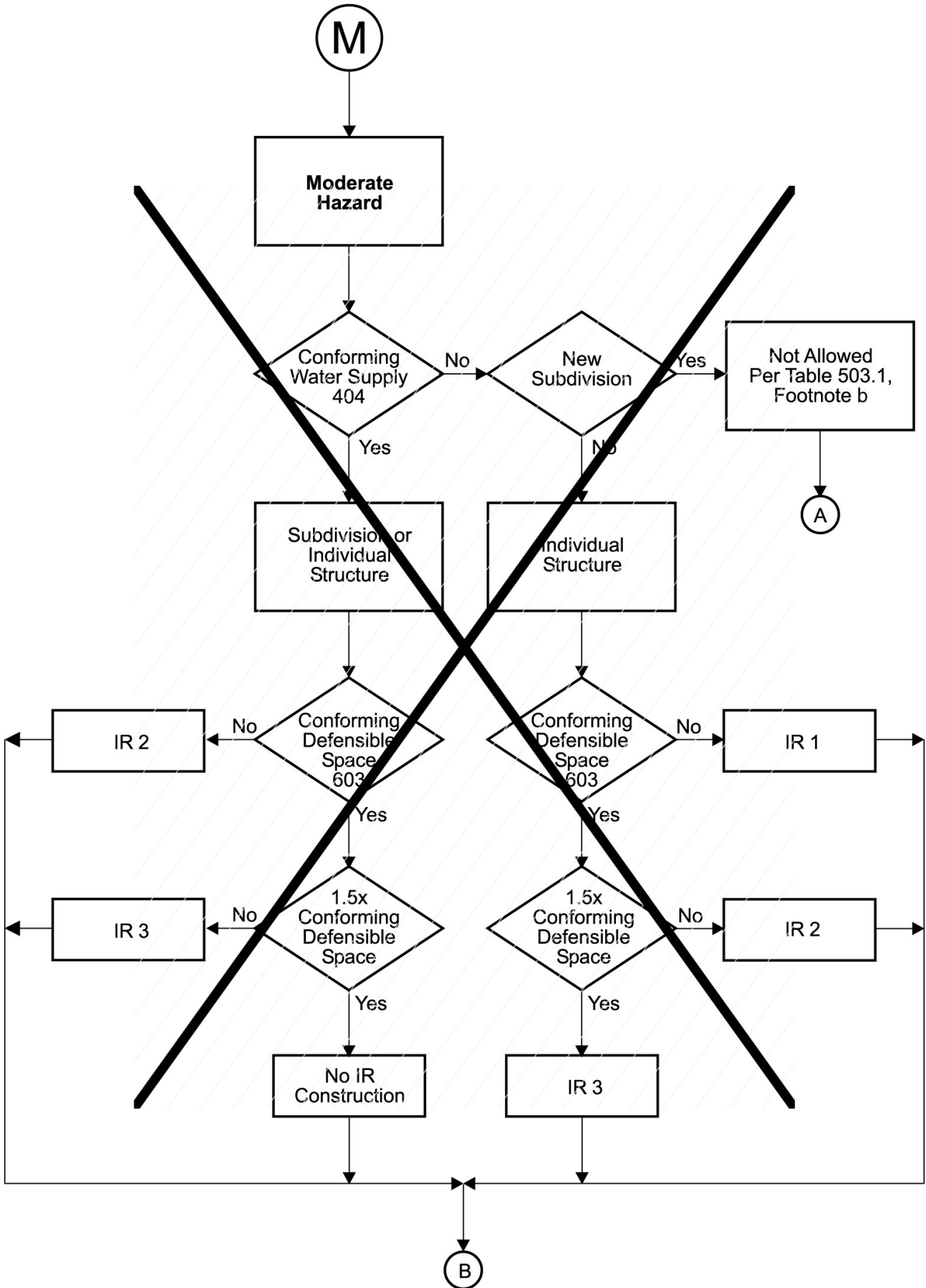


FIGURE H101.1(2) MODERATE HAZARD

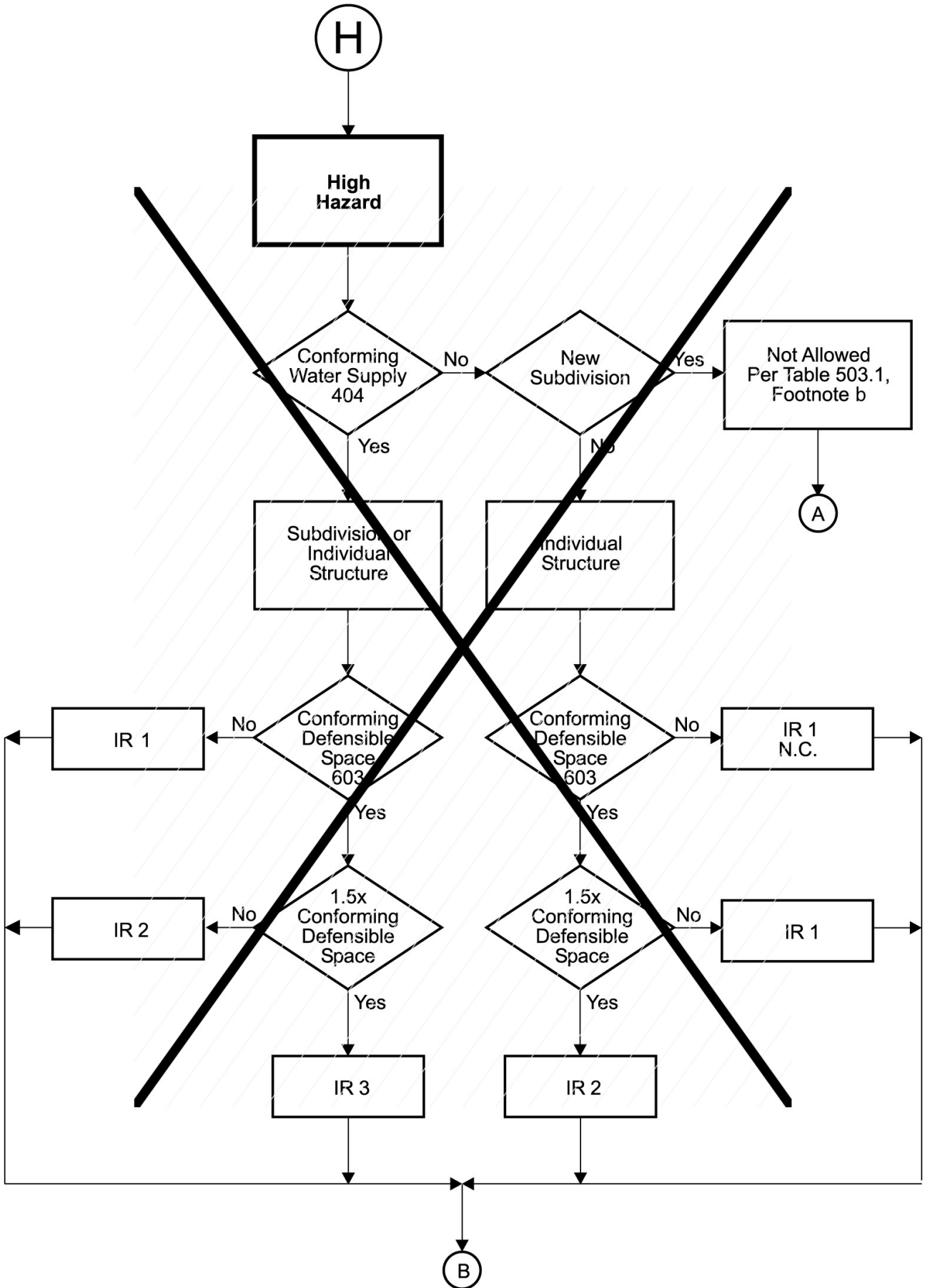


FIGURE H101.1(3) HIGH HAZARD

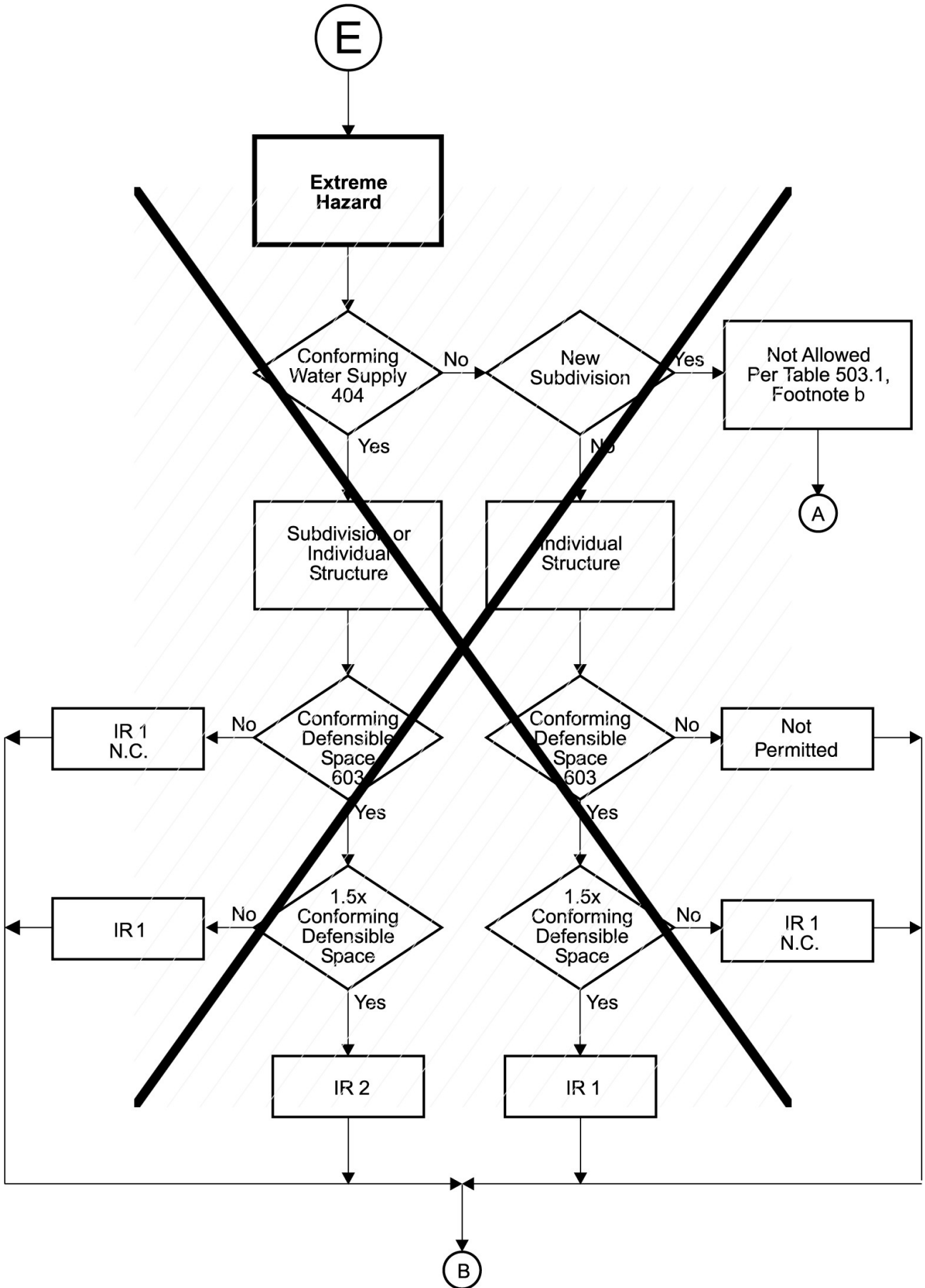


FIGURE H101.1(4) EXTREME HAZARD

Reason: This proposal recommends deleting Appendix H without substitution. This appendix is an informational flowchart based on Table 503.1. It has been in the IWUIC since its first edition, in 2003, just like the Table it is based on.

Several other proposals will recommend changes to that Table 503.1. In particular, the flowchart assumes that the issue of water supply is part of the table and that is proposed to be deleted since the intent is to make the structure capable of withstanding the approaching fire on its own, and not be dependent on the arrival of firefighters or application of water to the structure. The flowchart also contains nomenclature (such as IR 1 and IR 1 N.C.) that is proposed to be revised.

This flowchart is unique in the IWUIC code as a guide for a particular table in the code and is unnecessary.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the [FCAC Website](#)

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal simply deletes an optional appendix since proposed changes to Table 503.1 will make it inconsistent with the code requirements.

WUIC73-24

