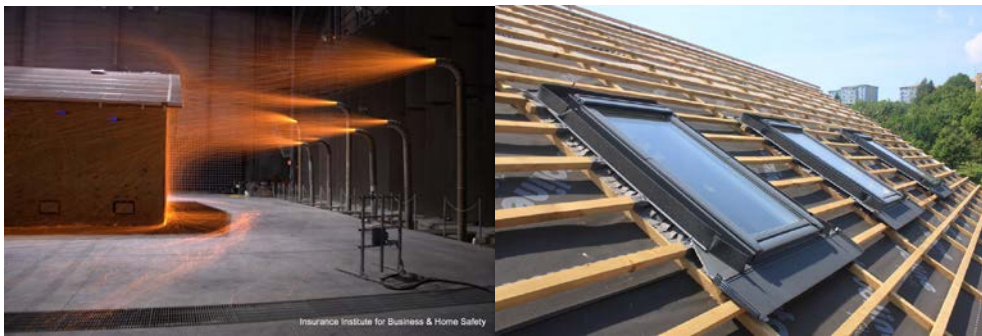


2016 Wildfire Protection Building Construction Task Force

Task Force Report and Recommendations



Comment [WU1]: Need more pictures.



Message from the State Fire Marshal

Mike Richwine
State Fire Marshal, Acting
CAL FIRE – OFFICE OF THE STATE FIRE MARSHAL

Acknowledgements

This report was developed through the culmination through outstanding collaborative efforts of the many disciplines involved with the Office of the State Fire Marshal **2016 Wildfire Protection Building Construction Task Force**.

Members of the Task Force:

Comment [WU2]: Anyone missing?

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The Office of the State Fire Marshal thanks each member and their organizations for their assistance with this important work.

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Task Force Overview, History and Scope

The Office of the State Fire Marshal (OSFM) established the 2016 Wildfire Protection Building Construction Task Force to review and evaluate the current wildfire protection building construction provisions within the California Building Standards Codes, as published in:

- 2016 California Building Code- Chapter 7A
- 2016 California Residential Code- Section R327
- 2016 California Fire Code- Chapter 49
- 2016 California Referenced Standards Code

The Task Force was asked to provide recommendations to the OSFM that will be considered as possible amendments for the 2016 Intervening Code Adoption Cycle, effective July 1, 2018. The group was further tasked with making recommendations to be considered for the the 2018 Triennial Code Adoption Cycle (2019 California Building Standards), effective January 1, 2020.

The Task Force, with representation from state and local code enforcement agencies, industry, fire testing laboratories, and other subject matter experts, first convened in May 2016 and met monthly through September 2016. This Task Force was a reformation of the previous OSFM *Wildfire Protection Building Construction (CBC 2010 CH7A) Task Force* that concluded in 2009. Several of the task force members served previously on "OSFM Wildland-urban Interface Building Standards Advisory Groups" in 2001, 2002, 2005, & 2009 and provided valuable continuity for legislative intent and underlying regulatory purpose for specific requirements.

History of Previous OSFM Wildfire Protection Regulations

The following background and summary of historical efforts may prove useful in understanding how the code ended up with the current provisions and provide context for developing plans for future rulemaking activities.

Local government ordinances banning the use of untreated wood roofing date back to 1923 following the Berkeley Hills Fire that destroyed 523 major buildings. However, it took another 65 years before minimum requirements to protect roofs and attic openings were consistently implemented statewide.

The origin of statewide building construction requirements to protect houses from wildfire exposure dates back 35 years. In 1981-1983 the legislature

established Health and Safety Code Section 13108.5 mandating that the OSFM propose minimum roof covering and attic opening requirements to the California Building Standards Commission. This resulted in California Building Code (CBC) Chapter 15 roofing requirements, the first known time a state building code incorporated provisions for wildfire protection. However, due to industry opposition, jurisdictional issues among state and local governments, and a lack of science-based technical data and understanding of the Wildland-urban Interface fire loss problem, effective implementation was thwarted for two decades.

In the mid 1990's OSFM began what would become a ten-year program, supported by millions of dollars of Federal Emergency Management Agency (FEMA) hazard mitigation funding, to develop new approaches to wildfire loss reduction. This program included development and publication of the Urban-Wildland Interface Code, the first such model building code, and University of California research, testing, and development of what would eventually become the CBC Chapter 7A fire test standards in use today.

In 2001 the *U.C. Forest Products Laboratory Performance Based Code Advisory Board* guided development of performance-based statements and objectives for use by the lab and the OSFM. The *Urban-Wildland Interface Building Standards Advisory Committee* (under several names and re-organizations) worked from 2002 through 2005 to provide the OSFM with recommendations that served as the essential foundation to establish CBC Chapter 7A and related code provisions.

The 2005 California's Wildland-Urban Interface Building Standards initially became effective in December 2005 and with phased implementation was fully applicable in July 2008. Although OSFM lacked the previous grant funding for staff, research, program development, the Code Development and Analysis Division staff guided the 2009 Task Force in making many substantial advancements as well as conducting numerous rulemaking activities during the intervening years from 2005 to 2015.

The 2009 OSFM Wildfire Protection Building Construction (CBC 2010 CH7A) Task Force completed the second comprehensive review of exterior wildfire exposure provisions for structures located within the Wildland Urban Interface, since they were originally adopted. The 2009 Task Force recommend amendments to simplify user application, clarify the intent of the regulations, and incorporate advancements in understanding wildfire exposure protection while maintaining the overall hazard mitigation goals established in 2005.

Task Group Scope

The scope of the project was to review and evaluate the current California Code of Regulations, Title 24 – 2016 California Building Code (CBC), Wildfire Protection Building Construction provisions (CBC 7A), to determine if revisions (amendments) are needed for the 2016 Intervening Code Adoption Cycle (effective July 1, 2018). Changes proposed for the CBC Chapter 7A will also be reflected within California Residential Code (CRC) Section R327, which is a mirrored section within the CRC.

The specific items that Task Group discussed were:

- **Skylights**- the role of Chapter 7A, in part, is to provide an ignition resistant envelope for buildings constructed in the wildland-urban interface areas of California. Chapter 7A is silent on the protection of skylights and therefore represents a breach in the otherwise complete protection of homes and other buildings within this high risk environment.

Section 1505.1.1 in the 2016 CBC currently requires a Class A rated roof covering/assembly (or equivalent) in VHFHSZs for new construction and should more than 50% of an existing covering be altered, repaired or replaced. Chapters 7A and 15 (other than an Exception to Section 1505.1 do not address skylights installed as part of the roof covering/assembly. This Exception refers one to Chapter 24 (glass & glazing) or Section 2610 (light-transmitting plastic skylight glazing). Section 2404 (wind, snow, seismic and dead loads on glass), Section 2405 (sloed glazing and skylights), and Section 2610 do not include or reference the applicable WUI requirements in Chapter 7A which also do not address skylights in VHFHSZs.

Skylights installed per applicable 2016 CBC requirements are not required to provide the minimum Class A fire-resistant ratings of the new or altered/repaired/replaced roof covering/assembly.

- **Garage Doors**- while attention has been given to the small openings in attic areas and other vented areas, the openings around garage doors has been ignored. The Task Force was asked to review and make recommendations that would limit ember intrusion into the very vulnerable garage interiors.
- **Accessory Structures**- The section on accessory structures is confusing as written in the present code and therefore the Accessory Structures Sub-group recommends that any 2016 code cycle amendments produce no change in regulatory effect of the existing code. Substantial changes to the requirements should be fully

Comment [WU3]: LeBrun (VELUX): That chapter is not silent – it directs the reader to Chapter 15 for skylights, which further points to other chapters for material testing requirements. Also, there has been no evidence presented that the existing fire testing and deployment specs represent inadequate protection.

Comment [WU4]: define

Comment [WU5]: Proposed text by Cal Lewis.

explored, evaluated, and given high priority during the 2018 Triennial Code Adoption Cycle (for the 2019 CBC). The Sub-group recommendations made are intended to facilitate consistent statewide application and assist the user in avoiding misapplication of provisions.

- **Referenced Standards-** the Task Force was asked to clarify the intent of the respective ASTM and California State Fire Marshal (CSFM) reference standards, provide guidance for their application, and provide additional information such as pass/fail criteria where the standards are applied.

Comment [WU6]: This needs to be a problem statement on the issue, not what we decided to do.

Recommendations

The following items are recommendations formed by the Task Force.

Skylights

The sub-group on skylights is concerned about the potential for fire penetration via skylights, when properly used and closed. Therefore, it proposed to treat skylights as windows or other glazing.

Comment [WU7]: Need a clear concise paragraph(1-2) outlining the skylight problem. See Garage Doors Section.

Need what and why changes are needed.

No Who / when

Proposed Code Changes to the California Building Code:

The following are proposed changes to the 2016 California Building Code (Chapter 7A). The same changes will need to be made in the 2016 California Residential Code to Section R337. See Appendix A for changes to CRC.

SECTION 708A **EXTERIOR WINDOWS, SKYLIGHTS AND DOORS**

708A.2 Exterior glazing. *The following exterior glazing materials and/or assemblies shall comply with this section:*

1. Exterior windows
2. Exterior glazed doors
3. Glazed openings within exterior doors
4. Glazed openings within exterior garage doors
5. Exterior structural glass veneer
6. Skylights

708A.2.1 Exterior windows, skylights and exterior glazed door assembly requirements. *Exterior windows, skylights and exterior glazed door assemblies shall comply with one of the following requirements:*

1. Be constructed of multipane glazing with a minimum of one pane meeting the requirements of Section 2406 Safety Glazing, or
2. Be constructed of glass block units, or

3. Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or

4. Be tested to meet the performance requirements of SFM Standard 12-7A-2

Comment [WU8]: LeBrun (VELUX): None of these are appropriate for skylights in most demand for commercial construction.

Rationale

Following the October 1991 Oakland Hills Fire, the California Building Standards Commission formed a working group to assist the OSFM in conducting fire research and developing regulatory measures to mitigate property damage from Wildland-Urban Interface fires. As a result, CBC, Chapter 7A-Wildland-Urban Interface Code was created. The provisions and standards contained within CBC Chapter 7A have been used successfully for many years decades in resisting wildland-urban interface fires. More particularly, the performance standard used for roofing materials and roof assemblies have been justified by the empirical data compiled and observations made, under wildfire conditions, of homes constructed in the wildland-urban interface since adoption of Chapter 7A. While overall performance with respect to the roof as a pathway to home loss was markedly improved, homes were lost to wildfires when ignition occurred within the attic area.

The two openings into the attic were attic vents and skylights. Driven by Chapter 7, the OSFM working with ASTM E05.14, Exterior Exposures Committee established the test protocols and apparatus for vents that would effectively limit flame and ember intrusion into the attic space. The inclusion of skylights under CBC Section 708A.2 Exterior Glazing, addresses the remaining pathway of flame and embers through the roof, and effectively completes the ignition resistant envelope of fire protection for homes in the wildland-urban interface. Including skylights in Chapter 7A provides the designers, owners, developers, building and fire officials, as well as subsequent homeowners, additional guidance in resisting wildland-urban interface fire exposure.

Comment [WU9]: Quarles: <http://windowanddoor.com/article/codes-standards/international-code-requirements-windows-doors>

The following from the website link. Does CBC include these sections and if so, are 7A requirements redundant?

“SKYLIGHTS AND SLOPED GLAZING
The 2012 IBC and 2012 IRC have different requirements for factory-built unit skylights than for other types of glazed assemblies in roofs such as skylights and sloped glazing. Factory-built unit skylights that contain only one panel of glazing material are required to be tested and labeled for performance grade in accordance with AAMA/WDMA/CSA 101/LS.2/A440-11 in both the 2012 IBC and IRC. Section 2405.5 of the 2012 IBC establishes the required performance-grade rating based on the provisions of that code for wind, snow and dead loads.

As for vertical glass, glass in sloped glazing is to be designed in accordance with ASTM E 1300-07e01. The requirements for screening under skylights and sloped glazing, as set forth in Section 2405.3 of the 2012 IBC and Section R308.6.3 of the 2012 IRC, are consistent with previous editions of the International Codes. This includes requiring the screening to be securely fastened to the framing and to be able to support twice the dead weight of the glass. Requirements for curbs on skylights and sloped glazing, when applicable, is also consistent with those in the previous editions of the International Codes, and are set forth in Section 2405.4 of the 2012 IBC and Section R308.6.8 of the 2012 IRC.”

Comment [WU10]: LeBrun (VELUX): Again, a skylight is much different from a vent. It has to be airtight and watertight, in addition to being able to withstand burn brands. Just the fact that they must be mounted higher than the surrounding roof greatly reduces the possibility of brand fire transfer through them. The Committee has not defined the true problem they are trying to solve.

Garage Doors

The 2016 CRC and CBC provide mandatory prescriptive requirements for newly-constructed residential and non-residential structures. Model International Residential and Building Codes are provided with the 2015 International Wildland-Urban Interface Code (IWUIC) that varies considerably with state-amended requirements.

Garage doors were identified by the Task Force as an area of significant risk for house fires during a wildfire event. Unlike IWUIC that exempts “vehicle

access doors”, the California exterior wildfire exposure building standards include “garage doors” with all other exterior door requirements. California building standards address door requirements, glazing and fire-resistive construction. The risks presented by the size of the garage opening and additional costs in meeting exterior door standards warranted additional research and investigation to protect property from fire during a wildfire event. Garage doors are called out in CBC Section 708A and CRC section R337.8.

Additional standards of protection were evaluated to the hazards of radiation, convection and flying embers. Considerations were made for permitting replacement garage doors, workmanship to create tight-fitting installations, weather stripping and fire-stopping assemblies, including intumescent materials surrounding the opening. Weather stripping proved an agreeable option to all members, and additional research topics were suggested for future investigation.

Comment [WU11]: Quarles: See pdf document showing ember ignition of weather stripping in pedestrian door during experiments at IBHS Research Center.

Proposed Code Changes to the California Building Standards:

The following are proposed changes to the 2016 California Building Code (Chapter 7A). The same changes will need to be made in the 2016 California Residential Code to Section R337. See Appendix A for changes to CRC.

708A.4 Weather stripping. *All exterior doors, including garage doors shall be provided with weather stripping to aid in the prevention of embers from entering through gaps between doors and door openings. Weather stripping or seals shall be installed on the bottom, sides, and tops of doors to reduce gaps between doors and door openings to ¼ inch or less.*

Comment [WU12]: Quarles: Use “resist intrusion” in place of “aid in the prevention”? Would “aid” imply something else is expected to be present? In code language, does “prevent” / “prevention” imply zero entry?

Comment [WU13]: Quarles: ¼ inch will still allow ember entry. If “prevent” means “zero”, it won’t happen with this working, so “resist” would be a better term.

Rationale

The Wildfire Task Force determined that weather stripping is an economically feasible and reasonable improvement that can limit airflow across the pressure zones on either side of door assemblies. Limiting air flow by requiring weather stripping on all doors, including garage doors will help prevent burning embers from entering or lodging in open gaps between doors and their openings. Noncombustible building and door materials will make ignition less likely however, the Task Force’s opinion is that even combustible weather stripping material will aid in resisting ember movement through the exterior door assembly that could start interior fires. Ignition resistance and minimum heat release rates were considered for weather stripping, however, the market availability of fire-resistive weather stripping products were not researched or evaluated for the Phase I proposal. The Task Force believes that “closing the gaps” in the garage door and assembly will help reduce fire movement to building interiors.

Comment [WU14]: Quarles: Stripping will resist entry into building interior, but can result in ignition in door jamb area, and result in entry of flames.

Accessory Structures

The accessory Structures recommendations are intended to facilitate consistent statewide application and assist the user in avoiding misapplication of provisions. A future Task Force should be fully explored, evaluated, and given high priority during the 2018 Triennial Code Adoption Cycle (for the 2019 CBC).

~~Recommendations for CBC Section 710A accessory structures: Due to time constraints the Task Force wasn't able to consider this section until late in the meeting schedule.~~—The Task Force found that the existing *Accessory Buildings and Miscellaneous Structures* section was confusing and elected to clean up the language, and consider substantive changes that might be easily agreed upon.

One source of confusion was that the CBC Section 710A has three different purposes:

- Provide for consistent statewide enforcement of specific and reasonable requirements for construction that pose a high level of potential exterior fire exposure exterior fire exposure to a major building (e.g. small sheds near a house or miscellaneous structures attached to a house).
- Provide authority for the local enforcing agency to evaluate site conditions and enforce specific requirements for sheds or detached structures that pose an intermediate level of potential exterior fire exposure hazard.
- Promote consistent statewide enforcement by clearly limiting application of CBC Chapter 7A state minimum requirements to the most hazardous situations that are consistent with the legislative intent for these regulations (e.g. placing no state requirements on buildings or structures located more than 50 feet from a home).

A second area of confusion was clarity around what buildings the full CBC Chapter 7A requirements apply to, what requirements apply to the smaller buildings covered by the application CBC Section 701A.3 Exception #1, and what requirements apply to various miscellaneous structures.

- Large accessory buildings and structures that no state minimum requirements apply to because they don't meet the legislative intent or fall within the scope and purpose of the chapter (e.g. agricultural buildings located at least 50 feet from ~~an~~ house or a business).
- Major buildings that the entire Ch7A applies to, e.g. houses, schools, apartment buildings (the kind of buildings that would be counted

during a post-fire damage assessment when hundreds or thousands of buildings are destroyed).

- Small accessory buildings requiring a building permit, not exceeding 120 square feet, and located at least 30 feet from “major” building (Section 701A.3 Exception #1).
- Attached miscellaneous structures requiring a building permit.
- Detached miscellaneous structures requiring a building permit.
- Small accessory buildings and miscellaneous structures NOT requiring a building permit.

The Task Force discussion on this section clearly illustrated the need (sometime, somewhere) for greater documentation of the legislative intent underlying these regulations and on the nature of the fire-loss problem(s) we are attempting to mitigate.

Additional items of concern discussed were discussed by the sub-group, including provisions that could become overly restrictive e.g. a hot tub under a 10'x15' patio cover located more than 20 feet from the house. Other questions were? How to handle play structures, portable sheds, and similar structures that do not require a building permit. Further questions were whether full assembly testing was needed for roof and wall assemblies needed or whether to retain some requirements that wouldn't apply only to the covering material, in order to clarify consistent enforcement. Another question raised was whether the section should apply? And application to fences and at for what distance a regulated fence should be. All these items were postponed for future action.?

Comment [WU15]: Quarles: Combustible play structures and ground cover surface under play structure. Rubber and wood mulch products, often placed under and around play structures are easily ignited by wind-blown embers and likely to subsequently result in flaming exposure to play structures that would have larger impact on structural support members (wood or WPC).

Comment [A16]: Incomplete Question-revise

Comment [WU17]: Needs to be more concise and clear for the report.

Proposed Code Changes to the California Building Code:

The following are proposed changes to the 2016 California Building Code (Chapter 7A). The same changes will need to be made in the 2016 California Residential Code to Section R337. See Appendix A for changes to CRC.

701A.3 Application. *New buildings located in any Fire Hazard Severity Zone or any Wildland-Urban Interface Fire Area designated by the enforcing agency constructed after the application date shall comply with the provisions of this chapter.*

Exceptions:

1. *Buildings of an accessory character classified as a Group U occupancy and not exceeding 120 square feet in floor area, when located at least 30 feet from an applicable building.*
2. *Buildings of an accessory character classified as Group U occupancy of any size located least 50 feet from an applicable building.*

3. Buildings classified as a Group U Agricultural Building, as defined in Section 202 of this code (see also Appendix C – Group U Agricultural Buildings), when located at least 50 feet from an applicable building.
4. Additions to and remodels of buildings originally constructed prior to the applicable application date.

For the purposes of this section and 710A, applicable building includes all buildings that have residential, commercial, educational, institutional, or similar occupancy type use.

701A.3.2 Application to accessory buildings and miscellaneous structures. New accessory buildings and miscellaneous structures specified in section 710A shall comply only with the requirements of that section.

710A.1 General. Accessory and miscellaneous structures, other than buildings covered by Section 701A.3, which pose a significant exterior exposure hazard to applicable buildings during wildfires shall be constructed to conform to the ignition resistance requirements of this section. Accessory buildings and miscellaneous structures defined in this section that have the potential to pose a significant exterior fire exposure hazard to applicable buildings during wildfires shall be constructed to conform to the requirements of this section.

710A.2 Applicability. The provisions of this section shall apply to trellises, arbors, patio covers, carports, gazebos and similar structures of an accessory or miscellaneous character. the specified accessory buildings covered by Section 701A.3 Exception 1. This section shall also apply to specified attached and detached miscellaneous structures that require a building permit, including but not limited to: trellises, arbors, patio covers, carports, gazebos, and similar structures.

Exceptions.

1. Decks shall comply with the requirements of Section 709A.
2. Awnings and canopies shall comply with the requirements of Section 3105.
3. Exterior wall architectural trim, embellishments, and fascias.
4. Roof or wall top cornice projections and similar assemblies.

710A.3 Where required. Accessory structures shall comply with the requirements of this section. No requirements shall apply to accessory buildings or miscellaneous structures when located at least 50 feet from an applicable building. Applicable accessory buildings and attached miscellaneous structures, or detached miscellaneous structures that are installed at a distance of less than 3 feet from an applicable building, shall

comply with this section. When required by the enforcing agency, detached miscellaneous structures that are installed at a distance of more than 3 feet but less than 50 feet from an applicable building shall comply with the requirements of this section.

710A.3.1 Accessory building requirements. ~~Attached accessory structures shall comply with the requirements of this section. Applicable accessory buildings that are less than 120 square feet in floor area, and are located more than 30 feet but less than 50 feet from an applicable building shall be constructed of noncombustible material or of ignition resistant material as described in Section 704A.2.~~

710A.3.2 Attached miscellaneous structure requirements. Applicable miscellaneous structures that are attached to, or installed at a distance of less than 3 feet from, an applicable building shall be constructed of noncombustible material or of ignition resistant material as described in Section 704A.2.

710A.3.2 Detached miscellaneous structure requirements. When required by the enforcing agency, applicable detached miscellaneous structures that are installed at a distance of more than 3 feet but less than 50 feet from, an applicable building shall be constructed of noncombustible material or of ignition resistant material as described in Section 704A.2.

~~**710A.4 Requirements.** When required by the enforcing agency accessory structures shall be constructed of noncombustible or ignition-resistant materials.~~

Rationale

The 2007 CBC provisions in section 704A.5.1 on ancillary buildings and structures led to inconsistent application and or misapplication of Chapter 7A requirements to different types of ancillary buildings and no direction on which provisions of Chapter 7A should be applied to other types of ancillary structures.” The current CBC 2013/2015 Section 710A requirements for ancillary buildings are improved but still apply variably to accessory buildings not covered by Section 701A.3, miscellaneous structures that are attached to the primary building, and detached accessory buildings or miscellaneous structures in ways that are difficult to enforce reasonably and consistently.

To help clarify the existing requirements the Sub-Group recommends two additions to Section 701A.3 to assist the user in correlating the application of requirements between Section 701A.3 and Section 710A, and two additional exceptions to Section 701A.2. There is no change in regulatory effect for the proposed modifications to either of the application provisions.

The recommended amendments to Section 710A.3 will clarify the specific locations where the requirements apply without changing the existing regulatory effect.

There exists the very real likelihood that any number of unpermitted accessory buildings, miscellaneous structures, and combustible personal property items such as vehicles and patio furniture located near the building will “pose a significant exterior exposure hazard to applicable buildings during wildfires.” These are realistic hazards but outside the scope and purpose of these building construction regulations (California Code of Regulations, Title 24, Part 2) and should be addressed by other hazard mitigation strategies such as public education, real estate requirements, or fire code enforcement,

Referenced Standards

It was identified by the wildfire task group that the CA OSFM standards, which were developed in the 1990s, have not been revised and updated in the intervening years. It was also identified that the ASTM E05 committee (on fire standards) had developed a number of standards that are updates and improvements on the CA OSFM standards and that they are standards that are being maintained and updated on a regular basis by a consensus standards committee. The sub-group on referenced standards was tasked with identifying the ASTM standards that were updates (and improvements) on the CA OSFM standards. A key further concept is that the ASTM standards do not include pass/fail criteria while the CA OSFM standards do contain them. Therefore, the task of the subgroup was to add wording equivalent to the OSFM criteria wherever the ASTM standards were being referenced.

The subgroup also ~~The initial task consisted of identifying the ASTM standards that had been developed by committee ASTM E05 (on fire standards) in order to replace or update the OSFM standards (see information that follows). Once that was done it was noticed that the ASTM standards had no pass/fail criteria and the OSFM criteria needed to be added. The ASTM standards found are updates (and improvements) on the OSFM standards, while being quite similar in concept.~~

~~It was also~~ noticed that no ASTM standard exists that is equivalent (or similar) to CA OSFM ~~SFM 12-7A-7 A-2~~ (exterior windows) and that this CA OSFM standard ~~needs~~ needed to be retained.

Comment [WU18]: Need better opening paragraph of what and why changes are needed.

It was also noticed that, for exterior vents, no ember penetration test exists within the OSFM set of tests, but that ASTM has issued ASTM E2886 ~~but~~ that the ASTM E2886 test was is proposed to be added into the CA 2016 WUI code, with pass/fail criteria that ensure no ember penetration or flame intrusion. However, small modifications are necessary in this section because it needs to be clear that ASTM E2886 cannot be "passed" but must be met with the appropriate criteria. Also, the alternates to CA OSFM 12-7-A-5 need to be included.

A discussion was held as to whether the OSFM standards should be deleted and it was decided to recommend that they be retained because that way manufacturers with materials or products that have already been approved would not have to retest their products for, at least in the next code edition first instance. It was also noticed that the ASTM standards are living documents that are likely to be revised and updated on a regular basis while the OSFM standards are likely to remain as is for the foreseeable future. Therefore, it was expected that the ASTM standards would have better likelihood of being maintained used in future and updated for continued use in the code. that future code editions might even eliminate the OSFM standards, although that was not recommended for the present cycle.

Because of the likely future utility of the ASTM standards, they are being proposed to be referenced first in each case, but without making any difference in options. It was made clear in the proposal that the code needs to accept passing either test (OSFM or ASTM with the conditions of acceptance shown) as equivalent for code purposes.

Replacements of SFM Tests with ASTM Tests for CA Code

- SFM 12-7A-1 MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE: Exterior Wall Siding and Sheathing – Equivalent to ASTM E2707-2015 *Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure Conditions of Acceptance*. If one of the three replicates fails to meet the Conditions of Acceptance, three additional tests shall be run. All of the 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-min test.

- SFM 12-7A-2 MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE: No ASTM equivalent exists

Conditions of Acceptance:

1. Duration of direct flame exposure. To pass this test standard, the window and window assembly shall withstand 8 minutes of direct flame exposure with the absence of flame penetration through the window frame or pane, or structural failure of the window frame or pane. Absence of flame penetration through the wall assembly at any time.

2. Flame penetration or structural failure. Flame penetration or structural failure of the flame or pane anytime during the test constitutes failure of this test standard.

- SFM 12 7A-3 MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE: Under Eave: Equivalent to ASTM E2957-2015 *Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections.*

Conditions of Acceptance:

If one of the three replicates fails to meet the Conditions of Acceptance, three additional tests shall be run. All of the 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-min test.

- SFM 12-7A-4 MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE: Decking – Contains 2 tests – Test Part A – Under Deck Flame Test: Equivalent to ASTM E2632/E2632M-2013e1 *Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials.*

Conditions of Acceptance.

If one of the three replicates fails to meet the Conditions of Acceptance, three additional tests shall be run. All of the additional tests must meet the Conditions of Acceptance.

1. Effective net 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.
- SFM 12-7A-4 MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE: Decking – Contains 2 tests – Test Part B – Burning Brand Exposure Test: Equivalent to ASTM E2726/E2726M-2012a *Standard Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands*.

Conditions of Acceptance:

If one of the three replicates fails to meet the Conditions of Acceptance, three additional tests shall be run. All of the 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-min observation period.
2. Absence of falling particles that are still burning when reaching the burner or floor.

- SFM 12 7A-4A MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE: Decking Alternate Method A – Under Deck Flame Test: Equivalent to ASTM E2632/E2632M-2013e1 *Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials*.

Condition of Acceptance:

If one of the three replicates fails to meet the Condition of Acceptance, three additional tests shall be run. All of the additional tests must meet the Condition of Acceptance.

1. Peak heat release rate of less than or equal to 25 kW/ft² (269 kW/m²).
- SFM 12 7A-5 MATERIALS AND CONSTRUCTION METHODS FOR EXTERIOR WILDFIRE EXPOSURE: Ignition Resistant Material: Equivalent to ASTM E84-2015b *Standard Test Method for Surface Burning Characteristics of Building Materials*, when tested in accordance with the test procedures and when the test is continued for an additional 20 minute period, for an “extended” 30 minute total period, with the following conditions of acceptance:

Conditions of Acceptance:

1. Material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30-minute test.
2. Material shall exhibit a flame front that does not progress more than 10-1/2 feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.

Proposed Code Changes to the California Building Code:

The following are proposed changes to the 2016 California Building Code (Chapter 7A). The same changes will need to be made in the 2016 California Residential Code to Section R337. See Appendix A for changes to CRC.

~~**703A.5.2 Weathering.** Fire-retardant-treated wood and fire-retardant-treated wood shingles and shakes shall meet the fire test performance requirements of this chapter after being subjected to the weathering conditions contained in the following standards, as applicable to the materials and the conditions of use.~~

Comment [WU19]: If no change remove.

~~**703A.5.2.1 Fire-retardant-treated wood.** Fire-retardant-treated wood shall be tested in accordance with ASTM D2898 (Method A) ~~2898~~, "Standard Practice for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing (Method A)" and the requirements of Section 2303.2.~~

~~**703A.7 Standards of quality.** The State Fire Marshal standards for exterior wildfire exposure protection listed below and as referenced in this chapter are located in the California Referenced Standards Code, Part 12 and Chapter 35 of this code. References to the standards listed below can be found in Chapter 35 of this Code and are contained in the appropriate sections, in some cases as alternate options to some of the state fire marshal standards referenced.~~

~~**SFM Standard 12-7A-1, Exterior Wall Siding and Sheathing.** A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for a 10-minute duration.~~

~~**SFM Standard 12-7A-2, Exterior Windows.** A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for an a 8-minute duration.~~

SFM Standard 12-7A-3, *Horizontal Projection Underside* A fire resistance test standard consisting of a 300 kW intensity direct flame exposure for a 10-minute duration.

SFM Standard 12-7A- 4, *Decking*. A two-part test consisting of a heat release rate (Part A) deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration, and a (Part B) sustained deck assembly combustion test consisting of a deck upper surface burning ember exposure with a 12 mph wind for 40 minutes using a 2.2lb (1kg) burning "Class A" size 12"x12"x 2.25" (300 mm x 300 mm x 57 mm) roof test brand.

SFM Standard 12-7A-4A, *Decking Alternate Method A*. A heat release rate deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration.

SFM Standard 12-7A-5, *Ignition-resistant Material*. A generic building material surface burning flame spread test standard consisting of an extended 30 minute ASTM E84 or UL 723 test method as is used for fire-retardant-treated wood.

[ASTM D2898-2010](#) Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing

[ASTM D3909/D3909M-2014](#) Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced With Mineral Granules

[ASTM E84-2016](#) Standard Test Method for Surface Burning Characteristics of Building Materials

[ASTM E2632/E2632M-2013e1](#) Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials

[ASTM E2707-2015](#) Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure

[ASTM E2726/E2726M-2012a](#) Standard Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands

[ASTM E2886/E2886M-2014](#) Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement

ASTM E2957-2015 Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections

NFPA 257-2012 Standard on Fire Test for Window and Glass Block Assemblies

UL 723-2008 Standard for Test for Surface Burning Characteristics of Building Materials

Comment [WU20]: Do we need years? Or can years be obtained from Chapter 35.

704A.2 Ignition-resistant materials. Ignition-resistant materials shall be determined in accordance ~~with complywithcomply~~ with one of the following:

1. The requirements in Section 704A.3 when tested in accordance with the test procedures set forth in ASTM E84 or UL 723.
2. The test procedures and requirements set forth in SFM Standard 12-7A-5 "Ignition-Resistant Material", or
3. One of the alternative methods in Section 704 A.4. in accordance with this section.

704A.3 Conditions of acceptance for ignition-resistant materials tested in accordance with ASTM E84 or UL 723. A material shall comply with the conditions of acceptance in 1 and 2 below when the test is continued for an additional 20-minute period, meaning for a total test period of an "extended" 30-minutes, minute test period, on the top and bottom surfaces.

Comment [JLW21]: Revised wording to be more consistent with Chapter 7A text.

Comment [JLW22]: Mandating testing top and bottom surfaces is not a requirement in Chapter 7A.

1. The material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30-minute test period.
2. The material shall exhibit a flame front that does not progress more than 10-1/2 feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test period.

~~704A.3~~**704A.4 Alternative methods for determining ignition-resistant material.** Any one of the following shall be accepted as meeting the definition of ignition-resistant material:

1. Noncombustible material. Material that complies with the definition for noncombustible materials in Section 202.
2. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use that complies with the requirements of Section 2303.2.
3. Fire-retardant-treated wood shingles and shakes. Fire-retardant-treated wood shingles and shakes, as defined in Section 1505.6 and listed by State Fire Marshal for use as "Class B" roof covering, shall be accepted as an ignition-resistant wall covering material when installed over solid sheathing.

Comment [WU23]: Quarles: Does this alternative method imply that FRT wood identified for exterior use cannot pass the test described in Section 704A.3?

705A.2 Roof coverings. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be fire stopped with approved materials or have one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM ~~D3909~~ ~~D-3909~~ installed over the combustible decking.

Comment [WU24]: Quarles: "prevent" implies no gap at all (zero embers, zero flame can pass). Every commercially available "bird stop" material that I have seen would not comply.

"prevent" used in this section. "resist" used in next section on vents. Is the intention that prevent = resist, or that roof edge opening more vulnerable than vent and therefore "prevent" necessary for roof but "resist" ok for use for attics?

705A.3 Roof valleys. Where valley flashing is installed, the flashing shall be not less than 0.019-inch (0.48 mm) No. 26 gage galvanized sheet corrosion-resistant metal installed over not less than one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM ~~D3909~~ ~~D-3909~~, at least 36-inch-wide (914 mm) running the full length of the valley.

706A **Vents**

706A.2 Requirements. Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that meet one of the following requirements:

1. Vents shall be listed to ASTM E2886 and comply with all of the following ~~Listed vents complying with ASTM E2886.~~
 - 1.1 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test ~~The Ember Intrusion Test shall have no flaming ignition of the cotton material.~~
 - ~~1.2~~ There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. ~~The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~
 - 1.3 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).
2. Vents ~~complying~~ shall comply with all of the following.
 - 2.1 The dimensions of the openings therein shall be a minimum of 1/16-inch (1.6 mm) and shall not exceed 1/8-inch (3.2 mm).
 - 2.2 The materials used shall be noncombustible.

Exception: Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible materials shall be permitted to be of combustible materials.
 - 2.3 The materials used shall be corrosion resistant.

706A.3 Ventilation openings on the underside of eaves and cornices. Vents shall not be installed on the underside of eaves and cornices.

Exceptions:

~~1. Vents listed to ASTM E2886 and complying with all of the following Listed vents complying with ASTM E2886.~~

~~1.1 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test. The Ember Intrusion Test shall have no flaming ignition of the cotton material.~~

~~1.2 There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~

~~1.3 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~

~~The 1. The enforcing agency may shall be permitted to accept or approve special eave and cornice -vents that resist the intrusion of flame and burning embers.~~

~~2- Vents complying with the requirements of Section 706A.2 may shall be permitted to be installed on the underside of eaves and cornices in accordance with either one of the following conditions:~~

~~2.1- The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or,~~

~~2.2- The exterior wall covering and exposed underside of the eave are of noncombustible material materials, or of ignition-resistant -materials, as determined in accordance with SFM Standard 12-7A-5 Ignition-Resistant Material the requirements of Section 704A.3, and the vent is located more than 12 feet (3.66 m) from the ground or walking surface of a deck, porch, patio or similar surface.~~

~~**706A.4 Exterior Vents:** Exterior vents shall comply with the conditions of acceptance in Section 706 A.4.1 when tested in accordance with both the ember intrusion test and the flame intrusion test in ASTM E2886.~~

~~**706A.4.1 Conditions of acceptance when tested in accordance with ASTM E2886:** The ember intrusion test shall have been complied with if flaming ignition of the cotton did not occur and if there was no evidence of ember penetration. The flame intrusion test shall have been complied with if flaming ignition did not occur during the integrity test portion of the test.~~

707A.3 Exterior walls. The exterior wall covering or wall assembly shall comply with one of the following requirements:

1. Noncombustible material
2. Ignition-resistant material
3. Heavy timber exterior wall assembly
4. Log wall construction assembly

Comment [WU25]: Quarles: OK. This section is saying that under these conditions, the ember resistance offered by screens will be sufficient. Flame resistance part of vent not needed because of either suppression component provided by 2.1 or decreased chance of flame impingement exposure because of 2.2.

Comment [WU26]: No change identified. Remove.

Comment [WU27]: Does not match 2016 CBC.

Comment [WU28]: Quarles: I don't know of a vent that will pass a test with criteria that allows "no evidence of ember penetration". 1/16-inch mesh allows small embers to pass. Language in 706A.3 uses term "resist". I don't interpret "resist" to mean "zero". In general, I think definitions regarding "resist" and "prevent" would be useful.

Comment [WU29]: Quarles: No restriction on log-to-log joint. If chink style, need to have criteria for fire performance of chinking?

5. Wall assemblies that meet the performance criteria have 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 707 A.3.1

6. Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in SFM Standard 12-7A-1.

Exception: Any of the following shall be deemed to meet the assembly performance criteria and intent of this section:

1. One layer of ⁵/₈-inch Type X gypsum sheathing applied behind the exterior covering or cladding on the exterior side of the framing
2. The exterior portion of a 1-hour fire resistive exterior wall assembly designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual

707A.3.1 Conditions of acceptance when tested in accordance with ASTM E2707. The ASTM E2702 test shall be conducted in triplicate on a minimum of three test specimens and the conditions of acceptance in 1 and 2 below shall be met. If any one of the three test replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall 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-min test.

~~707A.3.1~~ **707A.3.2 Extent of exterior wall covering.** Exterior wall coverings shall extend from the top of the foundation to the roof, and terminate at 2 inch (50.8 mm) nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.

707A.5 Enclosed roof eaves and roof eave soffits. The exposed underside of enclosed roof eaves having either a boxed-in roof eave soffit with a horizontal underside, or sloping rafter tails with an exterior covering applied to the underside of the rafter tails, shall be protected by one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of ⁵/₈-inch Type X gypsum sheathing applied behind an exterior covering on the underside of the rafter tails or soffit
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the rafter tails or soffit including assemblies

Comment [JLW30]: Revising for clarity. Requiring the ASTM E2702 test to be conducted in triplicate would technically require 9 test specimens, because ASTM E2702 requires a minimum of 3 test specimens.

Comment [WU31]: Quarles: Language that provides ground to top of foundation / start of siding would be helpful in improving ignition resistance from ember accumulation. See photos, "Ember Exposure IBHS" pdf

using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual

5. *Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in Section 707 A.9 when tested in accordance with the test procedures set forth in ASTM E2957*

6. *Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3*

Exceptions: *The following materials do not require protection:*

1. *Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails*
2. *Fascia and other architectural trim boards*

707A.6 Exterior porch ceilings. *The exposed underside of exterior porch ceilings shall be protected by one of the following:*

1. *Noncombustible material*
2. *Ignition-resistant material*
3. *One layer of ⁵/₈-inch Type X gypsum sheathing applied behind the exterior covering on the underside of the ceiling*
4. *The exterior portion of a 1-hour fire resistive exterior wall assembly 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*
5. *Porch ceiling assemblies with a horizontal underside that meet the performance criteria in Section 707 A.9 when tested in accordance with the test procedures set forth in ASTM E2957*
6. *Porch ceiling assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3*

Exception: *Architectural trim boards.*

707A.7 Floor projections. *The exposed underside of a cantilevered floor projection where a floor assembly extends over an exterior wall shall be protected by one of the following:*

1. *Noncombustible material*
2. *Ignition-resistant material*
3. *One layer of ⁵/₈-inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection*
4. *The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor projection including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual*

5. The underside of a floor projection assembly that meet the performance criteria in Section 707 A.9 when tested in accordance with the test procedures set forth in ASTM E2957

6. The underside of a floor projection assembly that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

Exception: Architectural trim boards.

707A.8 Underfloor protection. The underfloor area of elevated or overhanging buildings shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall consist of one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of 5/8-inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection
4. The exterior portion of a 1-hour fire resistive exterior wall assembly 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
5. The underside of a floor assembly that meets the performance criteria in Section 707 A.9 when tested in accordance with the test procedures set forth in ASTM E2957
6. The underside of a floor assembly that meets the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

Exception: Heavy timber structural columns and beams do not require protection.

707A.9 Conditions of acceptance when tested in accordance with ASTM E2957. The test shall be conducted in triplicate on a minimum of three test specimens and the conditions of acceptance in 1 through 3 below shall be met. If any one of the three tests replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall 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.

708A.2 Exterior glazing. The following exterior glazing materials and/or assemblies shall comply with this section:

Comment [JLW32]: Revising for clarity.

Comment [A33]: Confusing, should this just say "tests"

1. Exterior windows
2. Exterior glazed doors
3. Glazed openings within exterior doors
4. Glazed openings within exterior garage doors
5. Exterior structural glass veneer
6. Vents

~~**708A.2.1 Exterior windows and exterior glazed door assembly requirements.** Exterior windows and exterior glazed door assemblies shall comply with one of the following requirements:~~

- ~~1. Be constructed of multipane glazing with a minimum of one tempered pane meeting the requirements of Section 2406 Safety Glazing, or~~
- ~~2. Be constructed of glass block units, or~~
- ~~3. Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or~~
- ~~4. Be tested to meet the performance requirements of SFM Standard 12-7A-2~~

~~**708A.2.2 Structural glass veneer.** The wall assembly behind structural glass veneer shall comply with Section 707A.3.~~

Comment [WU34]: No changes? Remove

708A.3 Exterior doors. Exterior doors shall comply with one of the following:

1. The exterior surface or cladding shall be of noncombustible material
2. ~~The exterior surface or cladding shall be of~~ ignition-resistant material, or
3. ~~The exterior door shall~~ ~~2. Shall~~ be constructed of solid core wood that complies with the following requirements:
 - ~~2-1. 3.1~~ Stiles and rails shall not be less than 13/8 inches thick.
 - ~~2-2. 3.2~~ Raised panels shall not be less than 11/4 inches thick, except for the exterior perimeter of the raised panel that shall be permitted to may taper to a tongue not less than 3/8 inch thick.
- ~~3. Shall~~ ~~4. The exterior door assembly shall~~ have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252.
- ~~4. Shall~~ ~~5. The exterior surface or cladding shall~~ be tested to meet the performance requirements of Section 707 A.3.1 when tested in accordance with ASTM E2707.
6. The exterior surface or cladding shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

709A.3 Decking Surfaces. The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

~~1. Ignition-resistant material that~~ Material that complies with all of the performance requirements of Section 709 A.4 when tested in accordance with both ASTM E2632 and ASTM E2726.

Comment [JLW35]: "all of" not needed.

~~2. Ignition resistant material that complies with the performance requirements of 704A.3 when tested in accordance with ASTM E84 or UL 723.~~

Comment [WU36]: Quarles: Why don't we reference: ASTM E2768 - 11 Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)?

3. Material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.

~~2.4. Exterior fire retardant treated wood~~

~~3.5. Noncombustible material~~

~~4.6. Any material that complies with the performance requirements of Section 709 A.5 when tested in accordance with ASTM E2632 and when attached exterior wall covering is also either noncombustible or ignition-resistant material.~~

Comment [JLW37]: Underline formatting missing.

6. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also either noncombustible or ignition-resistant material.

Exception (to items 6 and 7): Wall material shall be permitted to may be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements ASTM ~~E84-E-84~~ with a Class B flame spread index rating.

Comment [JLW38]: Should delete the parentheses.

709A.4 Requirements for type of ignition-resistant material in Section 709A.3, item (1). The material shall be tested in accordance with both ASTM E2632 and in accordance with ASTM E2726 and shall comply with the conditions of acceptance shown below. The material shall also be tested in accordance with ASTM ~~vent~~-E84 or UL 723 and comply with the performance requirements of Section 704A.3. ~~when tested in accordance with ASTM E84 or UL 723.~~

Comment [WU39]: confusing

Conditions of acceptance for ASTM E2632: The ASTM E2632 test shall be conducted in triplicate on a minimum of three test specimens and the conditions of acceptance in 1 through 3 below shall be met. If any one of the three tests replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

Comment [JLW40]: Revising for clarity. Requiring the ASTM E2632 test to be conducted in triplicate would technically require 6 test specimens, because ASTM E2632 requires a minimum of 2 test specimens.

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.

Comment [A41]: "tests" instead?

Conditions of acceptance for ASTM E2726: The ASTM E2726 test shall be conducted in triplicate on a minimum of three test specimens and the conditions of acceptance in 1 and 2 below shall be met. If any one of the three tests replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

1. Absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40-min observation period

2. Absence of falling particles that are still burning when reaching the burner or floor.

Comment [JLW42]: Revising for clarity. Requiring the ASTM E2726 test to be conducted in triplicate would technically require 9 test specimens, because ASTM E2726 requires a minimum of 3 test specimens.

Comment [A43]: tests

Comment [WU44]: Chapter 35 items? Or elsewhere?

709A.5 Requirements for type of ignition-resistant material in Section 709A.3, item (6): The material shall be tested in accordance with ASTM E2632 and shall comply with the following condition of acceptance. The ASTM E2632 test shall be conducted in triplicate on a minimum of three test specimens and the peak heat release rate shall be less than or equal to 25 kW/ft² (269 kW/m²). If any one of the three tests replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the condition of acceptance.

Comment [A45]: tests

References (additions/updates) to Chapter 35 on referenced standards

[ASTM D2898-2010 Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing](#)

[ASTM D3909/D3909M-2012 e1 Standard Specification for Asphalt Roll Roofing \(Glass Felt\) Surfaced With Mineral Granules](#)

[ASTM E84-2016 ~~2013a~~ Standard Test Method for Surface Burning Characteristics of Building Materials](#)

[ASTM E2632/E2632M-2013 e1 Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials](#)

[ASTM E2707-2015 Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure](#)

[ASTM E2726/E2726-2012a Standard Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands](#)

[ASTM E2886/E2886M-2014 Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement](#)

[ASTM E2957-2015 Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections](#)

[NFPA 257-2012 Standard on Fire Test for Window and Glass Block Assemblies](#)

[UL 723-2008 Standard for Test for Surface Burning Characteristics of Building Materials](#)

Rationale

1. A decision was made to add the equivalent ASTM standards to the CA OSFM standards when they exist. ASTM standards exist covering most (but not all) the CA OSFM standards.
2. ASTM E05 (fire) standards typically have no pass/fail criteria but the CA OSFM standards do and that needs to be added. The criteria need to be in Chapter 7 and not in chapter 35 because they are not contained within the ASTM standards.
3. Retaining the CA OSFM standards is important because there are materials/products that have received approval based on them and they should not need to be retested immediately with the new code.
4. In future it is likely that ASTM standards may be modified and updated and, therefore, it is likely that, in future editions the CA OSFM standards may be replaced (because they do not change). Therefore, the ASTM standards have been placed as the first option with the CA OSFM standards as the second option.
5. Passing either test is considered equivalent for the code in the proposed text.
6. CA OSFMSFM 12 7 A5 is equivalent to the "extended ASTM E84 or UL 723" as a requirement for "ignition resistant materials". However, neither ASTM E84 nor UL 723 describe the "extended" protocol for the additional 20 minutes (for a total of 30 minutes) nor pass/fail criteria and those have been added. The CA OSFMSFM standard has been retained as an alternative option. Moreover, neither ASTM E84 nor UL 723 describes any option for "additional 20 minute" testing and so this must be described in the code, just like it is in the IBC.
7. ASTM E2707 is very similar to (and based on) CA OSFMSFM 12 7 A1. However, ASTM E2707 does not have pass/fail criteria and those have been added. The CA OSFMSFM standard has been retained as an alternative option.

Comment [WU46]: Quarles: Already mentioned, but does reference to ASTM E2768 instead of "extended E84" just complicated the issue too much?

8. ASTM E2957 is very similar to (and based on) [CA OSFMSFM 12 7 A3](#). However, ASTM E2957 does not have pass/fail criteria and those have been added. The [CA OSFMSFM](#) standard has been retained as an alternative option.
9. No [CA OSFMSFM](#) test exists for exterior vents but ASTM E2886 covers that issue. Therefore, this test was added to the CA code [in the 2016 edition](#). However, ASTM E2886 does not have pass/fail criteria and those have been added, based on no flame intrusion and no ember penetration. [A small change is proposed for this section because ASTM E2886 itself has no pass-fail requirements and cannot be "passed". Also, the alternates to CA OSFM 12-7-A-5 needed to be included in the section on vents.](#)
10. [CA OSFMSFM 12 7 A4](#) contains two tests and they have been issued separately as ASTM E2632 and ASTM E2726. However, neither ASTM E2632 nor ASTM E2726 have pass/fail criteria and those have been added. The [CA OSFM standard has SFM standards have](#) been retained as an alternative option.
11. ASTM E2632 is very similar to (and based on) [CA OSFMSFM 12 7 A4A](#) (and a portion of [CA OSFMSFM 12 7 A4](#)). However, ASTM E2632 does not have pass/fail criteria and those have been added. The [CA OSFMSFM](#) standard has been retained as an alternative option.
12. Section 709 A3 on decking surface, item 1 had duplicate requirements for [CA OSFMSFM 12 7 A4](#) and [CA OSFMSFM 123 7A5](#) and this has been separated into two subparagraphs, with the corresponding pass fail criteria. The [CA SFM](#) standards have been retained as an alternative option.
13. [CA OSFMSFM 12 7 A2](#) does not have an ASTM equivalent and has been retained without an alternative.

General Clean Up

This section contains items that need general clean up. No changes in regulatory effect. [The proposed wording below incorporates also the changes to the code sections recommended above.](#)

Proposed Code Changes to the California Building Code:

The following are proposed changes to the 2016 California Building Code (Chapter 7A). The same changes will need to be made in the 2016 California Residential Code to Section R337. See Appendix A for changes to CRC.

701A.5 Vegetation management compliance. *Prior to building permit final approval, the property shall be in compliance with the vegetation management requirements prescribed in California Fire Code Section 4906,*

including California Public Resources Code 4291 or California Government Code Section 51182. Acceptable methods of compliance inspection and documentation shall be determined by the enforcing agency and shall be permitted to maytomay include any of the following:

1. Local, state or federal fire authority or designee authorized to enforce vegetation management requirements
2. Enforcing agency
3. Third party inspection and certification authorized to enforce vegetation management requirements
4. Property owner certification authorized by the enforcing agency

706A.2 Requirements. Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that meet one of the following requirements:

3. Vents shall be listed to ASTM E2886 and comply with all of the following Listed vents complying with ASTM E2886.

3.1 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test The Ember Intrusion Test shall have no flaming ignition of the cotton material.

~~3.2~~ There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

3.3 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

4. Vents ~~complying~~ shall comply with all of the following.

~~1-~~ The dimensions of the openings therein shall be a minimum of $1/16$ -inch (1.6 mm) and shall not exceed $1/8$ -inch (3.2mm).

4.1 2 mm).

4.2 -The materials used shall be noncombustible.

Exception: Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible materials~~wire mesh~~, shall be permitted to may be of combustible materials.

~~3-~~ The materials used shall be corrosion resistant.

706A.3 Ventilation openings on the underside of eaves and cornices.

Vents shall not be installed on the underside of eaves and cornices.

Exceptions:

2. Vents listed to ASTM E2886 and complying with all of the following Listed vents complying with ASTM E2886.
 - 2.1 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test. ~~The Ember Intrusion Test shall have no flaming ignition of the cotton material.~~
 - ~~2.2~~ There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. ~~The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~
 - 2.3 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).
3. The enforcing agency ~~may~~ shall be permitted to accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.
4. Vents complying with the requirements of Section 706A.2 ~~may~~ shall be permitted to be installed on the underside of eaves and cornices in accordance with either one of the following conditions:

The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or,

- 4.1 The exterior wall covering and exposed underside of the eave are of noncombustible ~~material~~ materials or of ignition-resistant materials, as determined in accordance with ~~SFM Standard 12-7A-5 Ignition-Resistant Material~~ the requirements of Section 704A.3, and the vent is located more than 12 feet (3.66 m) from the ground or walking surface of a deck, porch, patio or similar surface.

~~**706A.3 Ventilation openings on the underside of eaves and cornices:**
Vents shall not be installed on the underside of eaves and cornices.~~

~~**Exceptions:**~~

- ~~1. The enforcing agency ~~is entitled to~~ may accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.~~
- ~~2. Vents complying with the requirements of Section 706A.2 shall be permitted to ~~may~~ be installed on the underside of eaves and cornices in accordance with either one of the following conditions:~~
 - ~~2.1. ~~The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or,~~~~
 - ~~2.2. The exterior wall covering and exposed underside of the eave are of noncombustible material, or ignition resistant materials as determined in accordance with SFM Standard 12-7A-5 Ignition-Resistant Material and the~~

~~vent is located more than 12 feet from the ground or walking surface of a deck, porch, patio or similar surface.~~

Comment [WU47]: Does not match 2016 CBC

708A.3 Exterior doors. Exterior doors shall comply with one of the following:

1. The exterior surface or cladding shall be of noncombustible material
2. The exterior surface or cladding shall be of ignition-resistant material, or
3. The exterior door shall ~~2. Shall~~ be constructed of solid core wood that complies with the following requirements:
 - 2.1. 3.1 Stiles and rails shall not be less than 13/8 inches thick.
 - ~~2-2. 3.2~~ Raised panels shall not be less than 11/4 inches thick, except for the exterior perimeter of the raised panel that shall be permitted to ~~may~~ taper to a tongue not less than 3/8 inch thick.
 - ~~3. Shall~~ 4. The exterior door assembly shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252.
 - ~~4. Shall~~ 5. The exterior surface or cladding shall be tested to meet the performance requirements of Section 707 A.3.1 when tested in accordance with ASTM E2707.
 6. The exterior surface or cladding shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

709A.3 Decking Surfaces. The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

1. ~~Ignition-resistant material that~~ Material that complies with all of the performance requirements of Section 709 A.4 when tested in accordance with both ASTM E2632 and ASTM E2726.
2. Ignition resistant material that complies with the performance requirements of 704A.3 when tested in accordance with ASTM E84 or UL 723.
3. Material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.
- ~~2-4. Exterior fire retardant treated wood~~
- 3.5. Noncombustible material
- 4.6. Any material that complies with the performance requirements of Section 709 A.5 when tested in accordance with ASTM E2632 and when attached exterior wall covering is also either noncombustible or ignition-resistant material.
6. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also either noncombustible or ignition-resistant material.

Exception (to items 6 and 7): 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.

708A.3 Exterior doors. Exterior doors shall comply with one of the following:

1. The exterior surface or cladding shall be of noncombustible or ignition-resistant material, or
2. Shall be constructed of solid core wood that comply with the following requirements:
 - 2.1. Stiles and rails shall not be less than 1³/₈ inches thick.
 - 2.2. Raised panels shall not be less than 1¹/₄ inches thick, except for the exterior perimeter of the raised panel that shall be permitted to ~~may~~ taper to a tongue not less than 3/₈ inch thick.
3. Shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252.
4. Shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

~~**709A.3 Decking Surfaces.** The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:~~

- ~~1. Ignition-resistant material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.~~
- ~~2. Exterior fire retardant treated wood~~
- ~~3. Noncombustible material~~
- ~~4. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also either noncombustible or ignition resistant material.~~ Rationale

~~**Exception:** Wall material shall be permitted to may be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements ASTM E 84 with a Class B flame spread rating.~~

Comment [WU48]: Changes are also being made in referenced standards section. Merge the two proposed changes.

Rationale

All of the changes are intended simply to eliminate non-mandatory language (the term "may") without altering the intended meaning. Non-mandatory language has the potential to create potential lack of clarity and/or of enforceability. Note, however that the proposed wording for the

change in this section incorporates also the other changes recommended for these sections.

Future Task Force Items

The OSFM is planning to reconvene this Task Force in early 2017 to continue discussing outstanding issues. Recommendations from the 2017 Task Force will be considered for the 2018 Triennial Code Adoption Cycle (2019 California Building Standards), effective January 1, 2020. Below is a narrative of some of the key items that were not finalized by the 2016 Task Force due to time constraints.

- ~~Operable Skylights~~ **Operable Skylights**- The roof has been the greatest fire vulnerability of the home, in the wildland-urban interface, for the past century. We developed and require an appropriate roof covering and assembly. We patched one "hole in the roof" with effective vents and now we need to patch the remaining hole; the operable skylight. NFPA 2015 Pathways for Building Fire Spread at the Wildland-Urban Interface, and NIST and ASTM jointly sponsored 2015 Workshop on Structure Ignition in Wildland-Urban Interface (WUI) Fires, (published summary: NIST Special Publication 1198) identified skylights as obvious pathways of WUI fire into homes. The skylights sub-group expressed the position that, during a fire event, operable skylights should perform as a component of a Class A roofing assembly or the roof assembly within which they are installed. This will require research and input from industry. The mitigation approaches to be explored should include both specification, E.G., ignition resistant screening; and performance, E.G., automatic closing.
-
- **Garage Doors**- The next task force will need to continue to explore ways to make garage door openings more resistant to fire. This will include market availability of ignition-resistant materials for weather stripping products; preferred standards of quality/performance for weather stripping, such as ASTM E1354; preferred standards of installation for threshold, side-frame, and header weather stripping installation; assessment to variations of door-styles and equivalent protection afforded to all door-types; weatherability of products to minimize owner service and continuing maintenance requirements.
- **Accessory Structures**- Substantial changes to the CBC requirements should be fully explored, evaluated, and given high priority during the 2018 Triennial Code Adoption Cycle (for the 2019 CBC). This includes developing prescriptive requirements, identifying reasonably effective

Comment [WU49]: Need a quick paragraph on why we need to look into this further. Just the facts.

Comment [WU50]: Need a quick paragraph on why we need to look into this further. Just the facts.

ignition resistant building construction methods that are more practical than applying the full CBC Chapter 7A provisions for outbuildings, sheds, carports, and similar structures, e.g. require a carport to have CBC Chapter 15 approved Class A roof covering instead of requiring a full Class A roof assembly.

Conclusion

Comment [WU51]: need

Appendix A- Proposed Code Changes to the CRC

Appendix A mirrors the proposed code changes to the CBC shown in the *Recommendations* section. CBC Chapter 7A and CRC Section R337 have the same requirements and need to match each other. The following are the proposed code changes to the CRC:

Skylights

SECTION R337.8 EXTERIOR WINDOWS, SKYLIGHTS AND DOORS

R337.8.2 Exterior glazing. *The following exterior glazing materials and/or assemblies shall comply with this section:*

1. Exterior windows
2. Exterior glazed doors
3. Glazed openings within exterior doors
4. Glazed openings within exterior garage doors
5. Exterior structural glass veneer
6. Skylights

R337.8.2.1 –Exterior windows, skylights and exterior glazed door assembly requirements. *Exterior windows, skylights and exterior –glazed door assemblies shall comply with one of the following –requirements:*

1. Be constructed of multipane glazing with a minimum of one –pane meeting the requirements of Section 2406 Safety –Glazing, or
2. Be constructed of glass block units, or
3. Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or
4. Be tested to meet the performance requirements of SFM –Standard 12-7A-2

Garage Doors

R337.8.4 Weather stripping. *All exterior doors, including garage doors shall be provided with weather stripping to aid in the prevention of embers from entering through gaps between doors and door openings. Weather stripping or seals shall be installed on the bottom, sides, and tops of doors to reduce gaps between doors and door openings to ¼ inch or less.*

Comment [WU52]: Quarles: See previous comment, Page 6, this document, Section 708A.4

Accessory Structures

R337.1.3 Application. *New buildings located in any Fire Hazard Severity Zone or any Wildland-Urban Interface Fire Area designated by the enforcing*

agency constructed after the application date shall comply with the provisions of this chapter.

Exceptions:

1. Buildings of an accessory character classified as a Group U occupancy and not exceeding 120 square feet in floor area, when located at least 30 feet from an applicable building.
2. Buildings of an accessory character classified as Group U occupancy of any size located least 50 feet from an applicable building.
3. Buildings classified as a Group U Agricultural Building, as defined in Section 202 of this code (see also Appendix C – Group U Agricultural Buildings), when located at least 50 feet from an applicable building.
4. Additions to and remodels of buildings originally constructed prior to the applicable application date.

For the purposes of this section and R337.10, applicable building includes all buildings that have residential, commercial, educational, institutional, or similar occupancy type use.

R337.1.5 Application to accessory buildings and miscellaneous structures. New accessory buildings and miscellaneous structures specified in section 710A shall comply only with the requirements of that section.

R337.1.6 Applicable buildings. Sections R337.1.3 and R337.1.3.1 shall apply to all buildings that have residential, commercial, educational, institutional, or similar occupancy type use.

~~R337.1.5~~**R337.1.7 Vegetation management compliance.** [text not shown for clarity]

~~**R337.10.1 General.** Accessory and miscellaneous structures, other than buildings covered by Section 701A.3, which pose a significant exterior exposure hazard to applicable buildings during wildfires shall be constructed to conform to the ignition resistance requirements of this section. Accessory buildings and miscellaneous structures defined in this section that have the potential to pose a significant exterior fire exposure hazard to applicable buildings during wildfires shall be constructed to conform to the requirements of this section.~~

~~**R337.10.2 Applicability.** The provisions of this section shall apply to trellises, arbors, patio covers, carports, gazebos and similar structures of an accessory or miscellaneous character. the specified accessory buildings covered by Section R337.1.3 Exception 1. This section shall also apply to~~

specified attached and detached miscellaneous structures that require a building permit, including but not limited to; trellises, arbors, patio covers, carports, gazebos, and similar structures.

Exceptions.

1. Decks shall comply with the requirements of Section R337.9.
2. Awnings and canopies shall comply with the requirements of Section 3105 of the California Building Code.
3. Exterior wall architectural trim, embellishments, and fascias.
4. Roof or wall top cornice projections and similar assemblies.

R337.10.3 Where required. ~~Accessory structures shall comply with the requirements of this section. No requirements shall apply to accessory buildings or miscellaneous structures when located at least 50 feet from an applicable building. Applicable accessory buildings and attached miscellaneous structures, or detached miscellaneous structures that are installed at a distance of less than 3 feet from an applicable building, shall comply with this section. When required by the enforcing agency, detached miscellaneous structures that are installed at a distance of more than 3 feet but less than 50 feet from an applicable building shall comply with the requirements of this section.~~

R337.10.3.1 Accessory building requirements. ~~Attached accessory structures shall comply with the requirements of this section. Applicable accessory buildings that are less than 120 square feet in floor area, and are located more than 30 feet but less than 50 feet from an applicable building shall be constructed of noncombustible material or of ignition resistant material as described in Section R337.10.2.~~

R337.10.3.2 Attached miscellaneous structure requirements. ~~Applicable miscellaneous structures that are attached to, or installed at a distance of less than 3 feet from, an applicable building shall be constructed of noncombustible material or of ignition resistant material as described in Section R337.10.2.~~

R337.10.3.2 Detached miscellaneous structure requirements. ~~When required by the enforcing agency, applicable detached miscellaneous structures that are installed at a distance of more than 3 feet but less than 50 feet from, an applicable building shall be constructed of noncombustible material or of ignition resistant material as described in Section R337.10.2.~~

R337.10.4 Requirements. ~~When required by the enforcing agency accessory structures shall be constructed of noncombustible or ignition-resistant materials.~~

Referenced Standards

~~**R337.3.5.2 Weathering.** Fire-retardant-treated wood and fire-retardant-treated wood shingles and shakes shall meet the fire test performance requirements of this chapter after being subjected to the weathering conditions contained in the following standards, as applicable to the materials and the conditions of use.~~

Comment [WU53]: double check all section numbers and cross references.

Comment [WU54]: If no change remove.

R337.3.5.2.1 Fire-retardant-treated wood. Fire-retardant-treated wood shall be tested in accordance with ASTM D2898 (Method A) ~~2898, "Standard Practice for Accelerated Weathering of Fire-Retardant Treated Wood for Fire Testing (Method A)"~~ and the requirements of Section 2303.2.

R337.3.7 Standards of quality. The State Fire Marshal standards for exterior wildfire exposure protection listed below and as referenced in this chapter are located in the California Referenced Standards Code, Part 12 and Chapter 44 of this code. References to the standards listed below can be found in Chapter 44 of this Code and are contained in the appropriate sections, in some cases as alternate options to some of the state fire marshal standards referenced.

SFM Standard 12-7A-1, Exterior Wall Siding and Sheathing. A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for a 10-minute duration.

SFM Standard 12-7A-2, Exterior Windows. A fire resistance test standard consisting of a 150 kW intensity direct flame exposure for an a 8-minute duration.

SFM Standard 12-7A-3, Horizontal Projection Underside A fire resistance test standard consisting of a 300 kW intensity direct flame exposure for a 10-minute duration.

SFM Standard 12-7A- 4, Decking. A two-part test consisting of a heat release rate (Part A) deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration, and a (Part B) sustained deck assembly combustion test consisting of a deck upper surface burning ember exposure with a 12 mph wind for 40 minutes using a 2.2lb (1kg) burning "Class A" size 12"x12"x 2.25" (300 mm x 300 mm x 57 mm) roof test brand.

SFM Standard 12-7A-4A, Decking Alternate Method A. A heat release rate deck assembly combustion test with an under deck exposure of 80 kW intensity direct flame for a 3-minute duration.

SFM Standard 12-7A-5, Ignition-resistant Material. A generic building material surface burning flame spread test standard consisting of an extended 30 minute ASTM E84 or UL 723 test method as is used for fire-retardant-treated wood.

~~ASTM D2898-2010~~ Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing

~~ASTM D3909/D3909M-2014~~ Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced With Mineral Granules

~~ASTM E84-2016~~ Standard Test Method for Surface Burning Characteristics of Building Materials

~~ASTM E2632/E2632M-2013e1~~ Standard Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials

~~ASTM E2707-2015~~ Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure

~~ASTM E2726/E2726M-2012a~~ Standard Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands

~~ASTM E2886/E2886M-2014~~ Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement

~~ASTM E2957-2015~~ Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections

~~NFPA 2572-2012~~ Standard on Fire Test for Window and Glass Block Assemblies

~~UL 723-2008~~ Standard for Test for Surface Burning Characteristics of Building Materials

Comment [WU55]: Do we need years? Or can years be obtained from Chapter 35.

R337.4.2 Ignition-resistant materials. Ignition-resistant materials shall be determined in accordance ~~with 2886~~ ~~comply with~~ ~~comply~~ with one of the following:

1. The requirements in Section R337.4.3 when tested in accordance with the test procedures set forth in ASTM E84 or UL 723,

2. The test procedures and requirements set forth in SFM Standard 12-7A-5 "Ignition-Resistant Material", or

3. One of the alternative methods in Section R337.4.4. in accordance with this section.

R337.4.3 Conditions of acceptance for ignition-resistant materials tested in accordance with ASTM E84 or UL 723. A material shall comply with the conditions of acceptance in 1 and 2 below when the test is continued for an additional 20-minute period, meaning a total of an "extended" 30-minute test period, on the top and bottom surfaces.

1. The material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30-minute test.

2. The material shall exhibit a flame front that does not progress more than 10-1/2 feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.

R337.4.4 Alternative methods for determining ignition-resistant material. Any one of the following shall be accepted as meeting the definition of ignition-resistant material:

1. Noncombustible material. Material that complies with the definition for noncombustible materials in Section 202.

2. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use that complies with the requirements of Section 2303.2 of the California Building Code.

3. Fire-retardant-treated wood shingles and shakes. Fire-retardant-treated wood shingles and shakes, as defined in Section 1505.6 of the California Building Code and listed by State Fire Marshal for use as "Class B" roof covering, shall be accepted as an ignition-resistant wall covering material when installed over solid sheathing.

R337.5.2 Roof coverings. Where the roof profile allows a space between the roof covering and roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be fire stopped with approved materials or have one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying with ASTM D3909 ~~D-3909~~ installed over the combustible decking.

R337.5.3 Roof valleys. Where valley flashing is installed, the flashing shall be not less than 0.019-inch (0.48 mm) No. 26 gage galvanized sheet corrosion-resistant metal installed over not less than one layer of minimum 72 pound (32.4 kg) mineral-surfaced nonperforated cap sheet complying

with ASTM ~~D3909~~ ~~D-3909~~, at least 36-inch-wide (914 mm) running the full length of the valley.

R337.6.2 Requirements. Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials, or other devices that meet one of the following requirements:

1. Vents listed to ASTM E2886 that comply with all of the following-Listed vents complying with ASTM E2886 with the following test results.

1.1 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test. ~~The Ember Intrusion Test shall have no flaming ignition of the cotton material.~~

1.2 There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. ~~The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~

1.3 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

2. Vents shall comply ~~complying~~ with all of the following.

a. The dimensions of the openings therein shall be a minimum of 1/16-inch (1.6 mm) and shall not exceed 1/8-inch (3.2 mm).

b. The materials used shall be noncombustible.

Exception: Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible materials shall be permitted to be of combustible materials.

c. The materials used shall be corrosion resistant.

R337.6.3 Ventilation openings on the underside of eaves and cornices: Vents shall not be installed on the underside of eaves and cornices.

Exceptions:

1. Vents listed to ASTM E2886 that comply with all of the following-Listed vents complying with ASTM E2886 with the following test results.

1.1 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test. ~~The Ember Intrusion Test shall have no flaming ignition of the cotton material.~~

1.2 There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. ~~The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~

1.3 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

2. The enforcing agency may *shall be entitled to* accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.

3.2. Vents complying with the requirements of Section R337.6.2 may *shall be permitted to* be installed on the underside of eaves and cornices in accordance with either one of the following conditions:

3.2.1. The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or,

3.2.2. The exterior wall covering and exposed underside of the eave are of noncombustible material materials, or ignition-resistant-materials, as determined in accordance with SFM Standard 12-~~7-A7A~~-5 Ignition-Resistant Material the requirements of Section 704A.3, and the vent is located more than 12 feet (3.66 m) from the ground or walking surface of a deck, porch, patio or similar surface.

Comment [WU56]: No change identified

~~R337.6.4 Exterior Vents:~~ Exterior vents shall comply with the conditions of acceptance in Section R337.6.4.1 when tested in accordance with both the ember intrusion test and the flame intrusion test in ASTM E2886.

~~R337.6.4.1~~ Conditions of acceptance when tested in accordance with ASTM E2886: The ember intrusion test shall have been complied with if flaming ignition of the cotton did not occur and if there was no evidence of ember penetration. The flame intrusion test shall have been complied with if flaming ignition did not occur during the integrity test portion of the test.

Comment [WU57]: Quarles: See previous comment, Page 17 this document, Section 706A4.1

R337.7.3 Exterior walls. The exterior wall covering or wall assembly shall comply with one of the following requirements:

1. Noncombustible material
2. Ignition-resistant material
3. Heavy timber exterior wall assembly
4. Log wall construction assembly
5. Wall assemblies that ~~meet the performance criteria~~ have 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 R337.7.3.1
6. Wall assemblies that meet the performance criteria in accordance with the test procedures for a 10-minute direct flame contact exposure test set forth in SFM Standard 12-7A-1.

Comment [WU58]: Quarles: See comment Page 16, Section 707A.3

Exception: Any of the following shall be deemed to meet the assembly performance criteria and intent of this section:

1. One layer of $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind the exterior covering or cladding on the exterior side of the framing
2. The exterior portion of a 1-hour fire resistive exterior wall assembly designed for exterior fire exposure including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual

R337.7.3.1 Conditions of acceptance when tested in accordance with ASTM E2707. The test shall be conducted in triplicate and the conditions of acceptance in 1 and 2 below shall be met. If any one of the three tests replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall 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-min test.

R337.7.3.2 Extent of exterior wall covering. Exterior wall coverings shall extend from the top of the foundation to the roof, and terminate at 2 inch (50.8 mm) nominal solid wood blocking between rafters at all roof overhangs, or in the case of enclosed eaves, terminate at the enclosure.

Comment [WU59]: Quarles: See comment, Page 18, Section 707A.3.2

R337.7.5 Enclosed roof eaves and roof eave soffits. The exposed underside of enclosed roof eaves having either a boxed-in roof eave soffit with a horizontal underside, or sloping rafter tails with an exterior covering applied to the underside of the rafter tails, shall be protected by one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the rafter tails or soffit
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the rafter tails or soffit including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual
5. Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in Section R337.7.9 when tested in accordance with the test procedures set forth in ASTM E2957
6. Boxed-in roof eave soffit assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

Exceptions: The following materials do not require protection:

1. Gable end overhangs and roof assembly projections beyond an exterior wall other than at the lower end of the rafter tails
2. Fascia and other architectural trim boards

R337.7.6 Exterior porch ceilings. The exposed underside of exterior porch ceilings shall be protected by one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind the exterior covering on the underside of the ceiling
4. The exterior portion of a 1-hour fire resistive exterior wall assembly 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
5. Porch ceiling assemblies with a horizontal underside that meet the performance criteria in Section R337.7.9 when tested in accordance with the test procedures set forth in ASTM E2957
6. Porch ceiling assemblies with a horizontal underside that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

Exception: Architectural trim boards.

R337.7.7 Floor projections. The exposed underside of a cantilevered floor projection where a floor assembly extends over an exterior wall shall be protected by one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of $\frac{5}{8}$ -inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection
4. The exterior portion of a 1-hour fire resistive exterior wall assembly applied to the underside of the floor projection including assemblies using the gypsum panel and sheathing products listed in the Gypsum Association Fire Resistance Design Manual
5. The underside of a floor projection assembly that meet the performance criteria in Section R337.7.9 when tested in accordance with the test procedures set forth in ASTM E2957
6. The underside of a floor projection assembly that meet the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

Exception: Architectural trim boards.

R337.7.8 Underfloor protection. The underfloor area of elevated or overhanging buildings shall be enclosed to grade in accordance with the requirements of this chapter or the underside of the exposed underfloor shall consist of one of the following:

1. Noncombustible material
2. Ignition-resistant material
3. One layer of 5/8-inch Type X gypsum sheathing applied behind an exterior covering on the underside of the floor projection
4. The exterior portion of a 1-hour fire resistive exterior wall assembly 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
5. The underside of a floor assembly that meets the performance criteria in Section R337.7.9 when tested in accordance with the test procedures set forth in ASTM E2957
6. The underside of a floor assembly that meets the performance criteria in accordance with the test procedures set forth in SFM Standard 12-7A-3

Exception: Heavy timber structural columns and beams do not require protection.

R337.7.9 Conditions of acceptance when tested in accordance with ASTM E2957. The test shall be conducted in triplicate and the conditions of acceptance in 1 through 3 below shall be met. If any one of the three tests replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall 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.

R337.8.2 Exterior glazing. The following exterior glazing materials and/or assemblies shall comply with this section:

1. Exterior windows
2. Exterior glazed doors
3. Glazed openings within exterior doors
4. Glazed openings within exterior garage doors
5. Exterior structural glass veneer
6. Vents

Comment [A60]: Confusing, should this just say "tests"
"sample or specimen"
"test sample or test specimen"

R337.8.2.1 Exterior windows and exterior glazed door assembly requirements. Exterior windows and exterior glazed door assemblies shall comply with one of the following requirements:

1. Be constructed of multipane glazing with a minimum of one tempered pane meeting the requirements of Section 2406 Safety Glazing, or
2. Be constructed of glass block units, or
3. Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or
4. Be tested to meet the performance requirements of SFM Standard 12-7A-2

708A.2.2 Structural glass veneer. The wall assembly behind structural glass veneer shall comply with Section R337.7.3.

Comment [WU61]: No changes? Remove

R337.8.3 Exterior doors. Exterior doors shall comply with one of the following:

1. The exterior surface or cladding shall be of noncombustible material
2. The exterior surface or cladding shall be of ignition-resistant material, or
3. The exterior door shall ~~2. Shall~~ be constructed of solid core wood that complies with the following requirements:
 - ~~2-1. 3.1~~ Stiles and rails shall not be less than 13/8 inches thick.
 - ~~2-2. 3.2~~ Raised panels shall not be less than 11/4 inches thick, except for the exterior perimeter of the raised panel that shall be permitted to may taper to a tongue not less than 3/8 inch thick.
 - ~~3. Shall~~ 4. The exterior door assembly shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252.
 - ~~4. Shall~~ 5. The exterior surface or cladding shall be tested to meet the performance requirements of Section R337.7.3.1 when tested in accordance with ASTM E2707.
 6. The exterior surface or cladding shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

R337.9.3 Decking Surfaces. The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

1. ~~Ignition resistant material that~~ Material that complies with all of the performance requirements of Section R337.9.4 when tested in accordance with both ASTM E2632 and ASTM E2726.
2. Ignition resistant material that complies with the performance requirements of R337.4.3 when tested in accordance with ASTM E84 or UL 723.
3. Material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.

~~2-4.~~ Exterior fire retardant treated wood

~~3-5.~~ Noncombustible material

~~4-6.~~ Any material that complies with the performance requirements of Section R337.9.5 when tested in accordance with ASTM E2632 and when attached exterior wall covering is also either noncombustible or ignition-resistant material.

7. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also either noncombustible or ignition-resistant material.

Exception (to items 6 and 7): Wall material *shall be permitted to* may be of any material that otherwise complies with this chapter when the decking surface material complies with the performance requirements ASTM E 84 with a Class B flame spread rating.

R337.9.4 Requirements for type of ignition-resistant material in Section 709A.3, item (1). The material shall be tested in accordance with ASTM E2632 and in accordance with ASTM E2726 and shall comply with the conditions of acceptance shown below. The material shall also comply with the performance requirements of Section R337.4.3 when tested in accordance with ASTM E84 or UL 723.

Comment [WU62]: confusing

Conditions of acceptance for ASTM E2632: The test shall be conducted in triplicate and the conditions of acceptance in 1 through 3 below shall be met. If any one of the three *tests/replicates* does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

Comment [A63]: "tests" instead?

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.

Conditions of acceptance for ASTM E2726: The test shall be conducted in triplicate and the conditions of acceptance in 1 and 2 below shall be met.

If any one of the three *tests/replicates* does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

Comment [A64]: tests

1. Absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40-min observation period

2. Absence of falling particles that are still burning when reaching the burner or floor.

Comment [WU65]: Chapter 44 items? What section should these be in.

R337.9.5 Requirements for type of ignition-resistant material in Section 709A.3, item (6): *The material shall be tested in accordance with ASTM E2632 and shall comply with the following condition of acceptance. The test shall be conducted in triplicate and the peak heat release rate shall be less than or equal to 25 kW/ft² (269 kW/m²). If any one of the three tests replicates does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the condition of acceptance.*

Comment [A66]: tests

General Clean Up

R337.1.5 Application to accessory buildings and miscellaneous structures. *New accessory buildings and miscellaneous structures specified in section 710A shall comply only with the requirements of that section.*

R337.1.6 Applicable buildings. *Sections R337.1.3 and R337.1.3.1 shall apply to all buildings that have residential, commercial, educational, institutional, or similar occupancy type use.*

R337.1.7 Vegetation management compliance. *Prior to building permit final approval, the property shall be in compliance with the vegetation management requirements prescribed in California Fire Code Section 4906, including California Public Resources Code 4291 or California Government Code Section 51182. Acceptable methods of compliance inspection and documentation shall be determined by the enforcing agency and shall be permitted to ~~may~~ include any of the following:*

Comment [WU67]: Code section changed by Accessory Structures group. Merge code changes.

1. Local, state or federal fire authority or designee authorized to enforce vegetation management requirements
2. Enforcing agency
3. Third party inspection and certification authorized to enforce vegetation management requirements
4. Property owner certification authorized by the enforcing agency

R337.6.2 Requirements. *Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials, or other ~~devises~~ devices that meet one of the following requirements:*

2. ~~Vents listed to ASTM E2886 that comply with all of the following-Listed vents complying with ASTM E2886 with the following test results.~~

2.1 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test. ~~The Ember Intrusion Test shall have no flaming ignition of the cotton material.~~

1.2 There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. ~~The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~

1.4 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

2. Vents shall comply ~~complying~~ with all of the following.

~~-~~The dimensions of the openings therein shall be a minimum of $1/16$ -inch (1.6 mm) and shall not exceed $1/8$ -inch (3.2 mm~~2mm~~).

d. ~~2.~~The materials used shall be noncombustible.

Exception: Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible ~~materials~~wire mesh, shall be permitted to ~~may~~ be of combustible materials.

~~3.~~The materials used shall be corrosion resistant.

R337.6.3 Ventilation openings on the underside of eaves and cornices: Vents shall not be installed on the underside of eaves and cornices.

Exceptions:

1. Vents listed to ASTM E2886 that comply with all of the following ~~Listed vents complying with ASTM E2886 with the following test results.~~

1.2 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test. ~~The Ember Intrusion Test shall have no flaming ignition of the cotton material.~~

1.2 There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test. ~~The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).~~

1.3 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

2. The enforcing agency ~~may~~ shall ~~be~~is entitled to ~~may~~ accept or approve special eave and cornice vents that resist the intrusion of flame and burning embers.

32. Vents complying with the requirements of Section R337.6.2 ~~may~~ shall be permitted to ~~may~~ be installed on the underside of eaves and cornices in accordance with either one of the following conditions:

32.1. The attic space being ventilated is fully protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 ~~or, of the California Building Code or,~~

32.2. The exterior wall covering and exposed underside of the eave are of noncombustible material materials, or ignition-resistant materials, as determined in accordance with SFM Standard 12-~~7-A7A~~-5 Ignition-Resistant Material the requirements of Section 704A.3, and the vent is located more than 12 feet (3.66 m) from the ground or walking surface of a deck, porch, patio or similar surface.

Comment [WU68]: Does not match 2016 CRC.

R337.6.4 Ventilation openings. Ventilation openings for enclosed attics, enclosed eave soffit spaces, enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters, and underfloor ventilation openings shall be fully covered with metal wire mesh, vents, other materials or other devices that meet one of the following requirements:

1. Vents shall be listed to ASTM E2886 and comply with all of the following.

1.2 There shall be no flaming ignition of the cotton material during the Ember Intrusion Test.

1.3 There shall be no flaming ignition during the Integrity Test portion of the Flame Intrusion Test.

1.4 The maximum temperature of the unexposed side of the vent shall not exceed 662°F (350°C).

2 Vents shall comply with all of the following.

2.2 The dimensions of the openings therein shall be a minimum of 1/16-inch (1.6 mm) and shall not exceed 1/8-inch (3.2 mm).

2.3 The materials used shall be noncombustible.

Exception: Vents located under the roof covering, along the ridge of roofs, with the exposed surface of the vent covered by noncombustible materials shall be permitted to be of combustible materials.

2.4 The materials used shall be corrosion resistant.

R337.8.3 Exterior doors. Exterior doors shall comply with one of the following:

Comment [WU69]: Changed by the referenced standards group. Merge.

1. The exterior surface or cladding shall be of noncombustible material

2. The exterior surface or cladding shall be of ignition-resistant material,
or

3. The exterior door shall ~~2-2~~. Shall be constructed of solid core wood that ~~complies~~comply with the following requirements:

2.1. 3.1 Stiles and rails shall not be less than $1\frac{3}{8}$ inches thick.

2.2. 3.2 Raised panels shall not be less than $1\frac{1}{4}$ inches thick, except for the exterior perimeter of the raised panel that shall be permitted to ~~may~~ taper to a tongue not less than $\frac{3}{8}$ inch thick.

3. ~~Shall~~4. The exterior door assembly Shall have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 252.

4. ~~Shall~~ 5. The exterior surface or cladding shall be tested to meet the performance requirements of Section R337.7.3.1 when tested in accordance with ASTM E2707.

6. The exterior surface or cladding Shall be tested to meet the performance requirements of SFM Standard 12-7A-1.

R337.9.3 Decking Surfaces. The walking surface material of decks, porches, balconies and stairs shall be constructed with one of the following materials:

1. Ignition-resistant material that Material that complies with all of the performance requirements of Section R337.9.4 when tested in accordance with both ASTM E2632 and ASTM E2726.

2. Ignition resistant material that complies with the performance requirements of R337.4.3 when tested in accordance with ASTM E84 or UL 723.

3. Material that complies with the performance requirements of both SFM Standard 12-7A-4 and SFM Standard 12-7A-5.

2.4. Exterior fire retardant treated wood

3.5. Noncombustible material

4.6. Any material that complies with the performance requirements of Section R337.9.5 when tested in accordance with ASTM E2632 and when attached exterior wall covering is also either noncombustible or ignition-resistant material.

7. Any material that complies with the performance requirements of SFM Standard 12-7A-4A when attached exterior wall covering is also either noncombustible or ignition-resistant material.

Exception (to items 6 and 7): Wall material shall be permitted to ~~may~~ be of any material that otherwise complies with this chapter when the decking

Comment [WU70]: Changed by the referenced standards group. Merge.

surface material complies with the performance requirements ASTM E 84 E84 with a Class B flame spread index rating.

R337.9.4 Requirements for type of ignition-resistant material in Section 709A.3, item (1). The material shall be tested in accordance with ASTM E2632 and in accordance with ASTM E2726 and shall comply with the conditions of acceptance shown below. The material shall also comply with the performance requirements of Section R337.4.3 when tested in accordance with ASTM E84 or UL 723.

Conditions of acceptance for ASTM E2632: The test shall be conducted in triplicate and the conditions of acceptance in 1 through 3 below shall be met. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall 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.

Conditions of acceptance for ASTM E2726: The test shall be conducted in triplicate and the conditions of acceptance in 1 and 2 below shall be met. If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the conditions of acceptance.

1. Absence of sustained flaming or glowing combustion of any kind at the conclusion of the 40-min observation period
2. Absence of falling particles that are still burning when reaching the burner or floor.

R337.9.5 Requirements for type of ignition-resistant material in Section 709A.3, item (6): The material shall be tested in accordance with ASTM E2632 and shall comply with the following condition of acceptance. The test shall be conducted in triplicate and the peak heat release rate shall be less than or equal to 25 kW/ft² (269 kW/m²). If any one of the three tests does not meet the conditions of acceptance, three additional tests shall be run. All of the additional tests shall meet the condition of acceptance.

Note: the new referenced standards with the corresponding dates (and the date update for ASTM E84 to 2016) need to be added to the chapters on referenced standards, as shown above.