Code Review
2018 Changes to International Codes

IBC - STRUCTURAL - ROOFING - ROOFING TAC

FLORIDA BUILDING COMMISSION
"Stronger Codes Through Science and Consensus"

Florida dbpr
Building Codes and Standards

2018 International Building Code - Roofing

Roofing TAC

IBC-Roofing Code Change No.	IBC-Roofing Section	Change Summary b/t 2015 IBC-R and 2018 IBC-R	Change Summary b/t 2017 IBC-R and 2018 IBC-R	Staff comments
S1-16	1401.1, 1501.1	Revises to clarify the scoping of chapters and references needing correction from a previous code change. The code change was further modified by the Committee. The modification does away with the proposed change to the scope of Chapter 15, retaining only the current wording. **Cost Impact:** Will not increase the cost of construction. This code change **merely clarifies the scoping of chapters** and references needing correction from a previous code change and does not change any provision of the code affecting cost.	Same as change between 2015 IBC-B and 2018 IBC-B	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S7-16	1510.1.1, 1510.2.1,1510.2.2, 1510.2.3	This change **clarifies** the intent of the code when a balcony or elevated walking surface serves as a weather resistant barrier and the joist spaces below are enclosed, cross ventilation is required as for enclosed rafter spaces of roofs. The code change was further modified by public comment. The public comment removed the provision for providing ventilation opening that allow inspection for decay. **Cost Impact:** Will not increase the cost of construction. Some vent openings may need to be modified to accommodate inspection of framing material. Many vent covers that are easily removable and re-installed with hand tools already comply with the intent of this requirement.	Same as change between 2015 IBC-B and 2018 IBC-B	

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G22-15	304.2, 308.2, 310.2, 402.2, 406.2, 410.2, 411.2, 412.2, 423.2, 502.1, 702.1, 802.1, 902.1, 1002.1, 1102.1, 1202.1, 1402.1, 1502.1, 1602, 1602.1, 1609.2, 1612.2, 1613.2, 1615.2, 1702.1, 1802.1, 2102.1, 2202.1, 2302.1, 2402.1, 2502.1, 2602.1, 3102.2, 3105.2, 3110.2, 404.1.1, 408.1.1, 722.1.1, [F] 307.2, [F] 415.2, [F] 421.2	Deletes definition “AMBULATORY CATR FACILITY.” Modifies Section 1602.1. There are changes to the following Definition sections of 304.2, 308.2, 310.2, 402.2, 406.2, 410.2, 411.2, 412.2, 415.2, 421.2, 423.2, 502.1, 702.1, 722.1.1, 802.1, 902.1, 1002.1, 1102.1, 1202.1, 1402.1, 1502.1, 1602, 1602.1, 1609.2,1612.2, 1613.2, 1615.2, 1702.1, 1802.1, 2102.1, 2302.1, 2402.1, 2502.1, 2602.1, 3102.2, 3105.2, 3110.2. The intent of this proposal is to remove the definition list sections scattered about the code and the lists of defined terms included within each such section. In general when new terms are added to Chapter 2, they rarely find themselves being added to one of these lists. Terms can be removed from Chapter 2, but don't always get removed from these lists. This proposal simply amends the sections to remove the lists and send the code users directly to Chapter 2. **Cost Impact:** Will not increase the cost of construction. The proposal is purely editorial in nature and will have no impact on actual construction.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

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S2-16	1503.1, 1503.2	Modifies text of Section 1503.1 “General”, 1503.2 “Flashing.”	This change is not	Overlapping provision to be

		Change to grammar concerning approved instructions. **Removal of vague wording.** **Cost Impact:** Will not increase the cost of construction. The proposal adds no additional mandatory requirements.	similar to that of the FBC. The FBC provides for Florida specific changes to this section	considered during step 2 of the code change process

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S8-16, Part I	1504.1.1	Modifies text of Section 1504.1.1 “Wind resistance of asphalt shingles.” This proposal is an editorial clarification that aligns the labeling requirement for the wind standards for asphalt shingles to provide consistent labeling requirements between the IRC and IBC. **Cost Impact:** Will not increase the cost of construction. The proposal is **editorial** and adds no new requirements.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

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S14-16	1504.1.1, 1504.3.3	Revises Table 1501.1.1 “CLASSIFICATION OF STEEP SLOPE ROOF SHINGLES TESTED IN ACCORDANCE WITH ASTM D7158 OR D 3161.” Adds new Section 1504.3.3 “Metal roof shingles.” Adds new standard “ASTM D3161/D3161M-15: Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method)” This proposal separates "metal roof shingles" as a separate	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

		line item product in Section 1504, specifically under the nonballasted roof systems provisions. This proposal also modifies the title of Table 1504.1.1 only as the table is appropriate to steep slope roofs other than asphalt shingles based on the modifications that first appeared in the 2013 Edition of ASTM Standard D3161. This proposal further modifies the ASTM standard to the 2015 edition. **Cost Impact:** Will not increase the cost of construction. This proposal would allow an **alternate testing method** which should add no cost to construction.		

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S56-16	Section: 1602.1, 1603.1, 1603.1.4, 1609.1.1, 1609.1.1.1, 1609.1.2.2, 1609.2, 1609.3, 1609.3(3) (New), 1609.3(5) (New), 1609.3(6) (New), 1609.3(7) (New), 1609.3(8) (New), 1609.3.1, 202, 2308.2.4, 2404.1, 2404.2, 2404.3.1, 2404.3.3, 2404.3.5, 2405.5.2	Modifies text of Section 1602.1 “Definitions”, Section 1603.1 “General.” 1603.1.4 “Wind design data”, 1609.1.1 “Determination of wind loads”, 1609.1.1.1 “Applicability”, 1609.1.2.2 “Application of ASTM E 1996”, 1609.2 “Definitions - HURRICANE-PRONE REGIONS, WIND-BORNE DEBRIS REGION, BASIC WIND SPEED, Vult, ALLOWABLE STRESS WIND SPEED, Vasd. Section 1609.3 “Basic design wind speed.” Modifies text of Figure 1609.3(1), FIGURE 1609.3(2), FIGURE 1609.3(3), FIGURE 1609.3(4), FIGURE 1609.3(5), FIGURE 1609.3(6), FIGURE 1609.3(7), FIGURE 1609.3(8). Modifies text of Section 1609.3.1 “Wind speed conversion.” Modifies Table 1609.3.1. Modifies text of definitions 2308.2.4 “Basic wind speed”, 2404.1 “Vertical glass”, 2404.2 “Sloped glass”, 2404.3.1 “Vertical wired glass”, 2404.3.3 “Vertical patterned glass.” 2404.3.5 “Vertical sandblasted glass”, SECTION 2405 “SLOPED GLAZING AND SKYLIGHTS.” This proposal is a coordination proposal to bring the 2018		

		IBC up to date with the provision of the 2016 edition of ASCE 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE 7-16). The changes proposed in all sections harmonizes terminology between the code and the loading standard. In all instances the word "ultimate" is changed to "basic" and the subscript "ult" is removed from the variable "V". Similarly, the word "nominal" is changed to "allowable stress" in all placed to be consistent with the terminology used in the loading standard. The increase in distance in 1609.1.1.1 Applicability to 2 miles from 1 mile is also to correct the discrepancy between the code and ASCE 7. The design wind speed maps have been updated to reflect the maps adopted into ASCE 7-16. Committee Reason modified original proposal. Updates the IBC wind load provisions for coordination with the latest edition of the referenced standard, ASCE 7 which was updated in ADM94-16. These terminology updates are very important to capture in the IBC. The modification picks up additional coordination with IBC wind requirements that were not in the original proposal. **Cost Impact:** Will not increase the cost of construction. The proposed map changes will decrease the cost of construction in the majority of the United States. The basic design wind speeds have been lowered at most locations on the new maps based on the latest data available, thus reducing the overall cost of construction. Along the hurricane coastline from Virginia to Texas, the wind speeds remain nearly unchanged from the current maps and thus the cost of construction will not change. There may be a very small increase in Category IV structures in some parts of the country, due to the new mean recurrence interval for Risk Category IV, which has now been separated from Risk Category III. The basic wind speeds for all four Risk Category maps decrease very significantly west of the Continental Divide. For example, in much of coastal California wind speeds decrease by as much as 16%, 15%, and 11% from		

		the previous maps for Risk Category II, III, and IV structures, respectively. Wind speeds in the Northern Great Plains states are similar to previous maps, and wind speeds in hurricane prone regions from Virginia to Texas remain nearly unchanged. In the rest of the continental United States south and east of the Great Plains, wind speeds decrease as much as 12%, 8%, and 4% for Risk Category II, III, and IV buildings respectively. For a comparatively small number of buildings, the design wind speeds for Risk Category IV increase slightly as a result of the split of Risk Category III and IV into separate maps with different mean recurrence intervals. The wind speeds for Risk Category IV buildings increase on the order of 5% in hurricane-prone regions from Virginia to Texas. The wind speeds for Risk Category IV buildings increase about 2% in much of Nebraska and the Dakotas and to a lesser extent in the adjacent states. This proposal coordinates the IBC with the referenced loading standard ASCE 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures. ASCE 7 will be updated from the 2010 edition to the 2016 edition as an Administrative Update to the 2018 I-Codes. As of the submission date of this code change proposal, the ASCE 7 Standards Committee has completed the committee balloting on the technical changes. The document designated ASCE 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures is expected to be completed, published, and available for purchase prior to the ICC Public Comment Hearings for Group B in October of 2016. Any person interested in obtaining a public comment copy of ASCE 7-16 may do so by contacting James Neckel at ASCE (jneckel "at" asce.org).		

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S9-16	1504.2.1.1	Modifies text of 1504.2.1.1 “Overturning resistance.” Adds new standard “ASTM C1568-08(2013), Standard Test Method for Wind Resistance of Concrete and Clay Roof Tiles (Mechanical Uplift Resistance Method).” There are no technical changes proposed with this code change request. ASTM C1568 is simply a duplication of the relevant sections of SSTD 11-99 with regard to the mechanical uplift resistance method. This modification now references a consensus standard that will have the capability to be updated in the future, as SSTD 11 has not been updated since 1999. This code change was further modified by the Committee. The modification clarifies that you still have to comply with Chapter 15 as well as one of the referenced standards. **Cost Impact:** Will not increase the cost of construction. The **ASTM standard replicates the current requirements of SBCCI** SSTD-99, and therefore will increase the cost of construction.	Same as change between 2015 IBC-B and 2018 IBC-B			
TAC Action **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**		**Commission Action** **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**			**TAC**	**Cmsn.**
				☐ **No Action Needed**	☐	☐
				☐ **Overlapping provisions**	☐	☐
S11-16	1504.3	Modifies text of section 1504.3 “Wind resistance of nonballasted roofs.” This proposal is being submitted to provide clarification regarding how to calculate wind loads on	Same as change between 2015 IBC-B and 2018			

		roof coverings. The introduction of ASCE 7-10 into the IBC, and its use of ultimate design wind speeds has caused confusion with design professionals when calculating wind loads on roof coverings. This code change was further modified by the Committee. The modification provides the clarification that allowable stress design is permitted and that it is an option, not mandatory. **Cost Impact:** Will not increase the cost of construction. This proposal is a **clarification regarding** how to calculate wind loads on roof coverings. It will have no impact on the cost of Construction.	IBC-B	

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S18-16 Part I	1504.7, 1507.11.2, 1507.12.2, 1507.13.2	Modifies text of Section 1504.7 “Impact resistance”, 1507.11.2 “Material standards”, 1507.12.2 “Material standards”, 1507.13.2 “Material standards.” The proposal removes withdrawn Canadian standards. **Cost Impact:** Will not increase the cost of construction. The **referenced standards have been withdrawn** and are invalid.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

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S21-16	1504.8	Modifies text of Section 1504.8 “Surfacing and ballast materials in hurricane-prone regions.” This proposal removes	This change is not similar to that of	Overlapping provision to be considered during step 2 of the

		a run on sentence to allow for more consistent interpretation and enforcement. **Cost Impact:** Will not increase the cost of construction. No increase to the cost of construction as **this is a clarification** of current requirements.	the FBC. The FBC provides for Florida specific changes to this section	code change process

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S2-15	1505.9, Chapter 35	Modifies text of Section 1505.9 “Rooftop mounted photovoltaic panel systems.” Add new standard “UL 2703-14, Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels.” The new UL 2703 standard, which is an ANSI consensus standard, provides the test method for testing multiple panels for each racking system. Either standard can be used to establish a fire classification of the photovoltaic panel system. This will provide another method to test photovoltaic systems for fire classification. **Cost Impact:** Will not increase the cost of construction. This will **provide another method to test photovoltaic systems** for fire classification.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

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S1-15	1505.10	Modifies text of Section [BF] 1505.10 “Roof gardens and landscaped roofs.” Modification to **clarify intent** of the code. Also the proposed change clarifies the fire classification requirements in Section 1505 apply to roof gardens and landscaped roofs. **Cost Impact:** Will not increase the cost of construction. The proposed change is a **clarification** and does not change the stringency of existing code requirements so the cost of construction will be unchanged.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

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S27-16	1507.1.1 (New), 1507.1.2 (New), 1507.2.3, 1507.3.3, 1507.4.5, 1507.5.3, 1507.5.4, 1507.6.3, 1507.6.4, 1507.7.3, 1507.7.4, 1507.8, 1507.9.3, 1507.9.4, 1507.17.3, 1507.17.4	Adds new Section. 1507.1.1 “Underlayment”, 1507.1.2 “Ice barriers”, Modifies TABLE 1507.1.1(1) “Underlayment Types”, TABLE 1507.1.1(2) “Underlayment Application”, TABLE 1507.1.1(3) “Underlayment Attachment.” TABLE 1507.8 “WOOD SHINGLE AND SHAKE INSTALLATION.” Deletes Section 1507.2.4 “Self-adhering polymer modified bitumen sheet”, 1507.2.8 “Underlayment application”, 1507.2.8.1 “High wind attachment.” 1507.3.3.1 “Low-slope roofs”, 1507.3.3.2 “High-slope roofs”, 1507.3.3.3 “High wind attachment”, 1507.5.3.1 “Underlayment and high wind”, 1507.6.3.1 “Underlayment and high wind”, 1507.8.3.1 “Underlayment and high wind”, 1507.9.3 “Underlayment”, 1507.9.3.1 “Underlayment and high wind”, 1507.17.4 “Underlayment application”, 1507.17.4.1 “High wind attachment.” Revises text of 1507.2.3 “Underlayment”, 1507.2.8 “Ice barrier”, 1507.3.3 “Underlayment”, 1507.4.5 “Underlayment and high wind”, 1507.5.3 “Underlayment”, 1507.5.4 “Ice	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

		barrier", 1507.6.3 "Underlayment", 1507.6.4 "Ice barrier", 1507.7.3 "Underlayment", 1507.7.4 "Ice barrier", 1507.8.3 "Underlayment", 1507.8.4 "Ice barrier", 1507.9.4 "Ice barrier", 1507.17.3 "Underlayment." This proposal is primarily a **reorganization of the underlayment provisions** contained within the IBC. Many of the roof covering provisions contain similar and overlapping requirements for underlayment type, application, and attachment This proposal relocates the underlayment requirements for each roof covering to a single section at the beginning of Section 1507. This reorganization results in three new tables that address underlayment type, application, and attachment required for each of the roof covings in the IBC that require underlayment. The reorganization proposed here was approved during the last code development cycle for the 2015 IRC. This proposal also clarifies the use of ASTM D 1970 as an underlayment. This code change was further modified by the Committee. The modification clarifies that metal panels do not require underlayment. **Cost Impact**: Will not increase the cost of construction. **Will result in an increase in cost in some areas**. The wind speed trigger for the enhanced underlayment has been slightly lowered resulting in it applying to more areas. However, this change will achieve consistency with IRC with regards to underlayment.		

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S28-16, Part I	1507.17.4.1, 1507.2.4, 1507.2.8.1,	Modifies text of Sections 1507.2.4 "Self-adhering polymer modified bitumen sheet", 1507.2.8.1 "High wind attachment", 1507.2.9.2 "Valleys", 1507.3.9 "Flashing", 1507.4.5	This change is not similar to that of the FBC. The FBC	Overlapping provision to be considered during step 2 of the code change process

	1507.2.9.2, 1507.3.3.3, 1507.3.9, 1507.4.5, 1507.5.3.1, 1507.5.7, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.8.8, 1507.9.3.1, 1507.9.9	"Underlayment and high wind", 1507.5.3.1 "Underlayment and high wind", 1507.5.7 "Flashing", 1507.6.3.1 "Underlayment and high wind", 1507.7.3.1 "Underlayment and high wind", 1507.8.3.1 "Underlayment and high wind", 1507.8.8 "Flashing", 1507.9.3.1 "Underlayment and high wind", 1507.9.9 "Flashing", 1507.17.4.1 "High wind attachment." The proposal adds a requirement that self-adhering underlayments bear a label to demonstrate compliance to the code. The labeling requirement for underlayments was part of a comprehensive proposal for the IRC in the past cycle; this proposal is to bring similar changes for the IBC this year. **Cost Impact:** Will not increase the cost of construction. **Will require products bear a label, which will add product approval costs.** The IRC already contains an underlayment labeling requirement, so the cost impact is expected to be minimal.	provides for Florida specific changes to this section	

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S31-16	1507.17.4.1, 1507.2.8.1, 1507.3.3.3, 1507.4.5, 1507.5.3.1, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.9.3.1	Modifies text of 1507.2.8.1 High wind attachment., 1507.3.3.3 High wind attachment., 1507.4.5 Underlayment and high wind., Modifies text of 1507.5.3.1 "Underlayment and high wind", 1507.6.3.1 "Underlayment and high wind", 1507.7.3.1 "Underlayment and high wind", 1507.8.3.1 Underlayment and high wind", 1507.9.3.1 "Underlayment and high wind", 1507.17.4.1 "High wind attachment." The IBC requirement for cap nails for attachment of roof covering underlayment in high-wind areas does not reflect commercially available cap staples successfully used in	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

		roofing material application. This proposal expands fastener alternatives to include cap staples based on testing which indicates the underlayment tears before the proposed cap staples fail. **Cost Impact:** Will not increase the cost of construction. **Recognition of these cap nails and staples should provide greater choice** to the end user of those products that are already commercially available and allowed by the IRC.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

S32-16	1507.17.4.1, 1507.2.8.1, 1507.3.3.3, 1507.4.5, 1507.5.3.1, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.9.3.1	Modifies text of 1507.2.8.1 High wind attachment., 1507.3.3.3 “High wind attachment” , 1507.4.5 “Underlayment and high wind” , 1507.5.3.1 “Underlayment and high wind” , 1507.6.3.1 “Underlayment and high wind” , 1507.7.3.1 “Underlayment and high wind”, 1507.8.3.1 “Underlayment and high wind” , 1507.9.3.1 “Underlayment and high wind” , 1507.17.4.1 “High wind attachment”. This code change proposal is identical to the proposal approved for the 2015 IRC. The cap nails listed for attachment of roof covering underlayment in high-wind areas does not reflect commercially available cap staples successfully used in roofing material application. IBC presently lists a minimum nail shank of 0.105". This proposal lowers the minimum shank diameter based on tests indicating that the underlayment tears prior to failure of the proposed cap nail. **Cost Impact:** Will not increase the cost of construction. Recognition of these ring shank and smooth cap nails should	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

		provide **greater choice to the end user** of those products that are already commercially available and allowed by the IRC.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

S30-16	1507.2.5	Modifies text of 1507.2.5 “Asphalt shingles.” ASTM D 225 has been withdrawn by ASTM and thus should no longer be referenced in IBC as a material standard for asphalt shingles with organic felt. The recognized standard specification for asphalt shingles is ASTM D 3462. **Cost Impact:** Will not increase the cost of construction. The proposed change **does not change the stringency** of existing code requirements so the cost of construction will be unchanged.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

S39-16	1507.8.9 (New), 1507.9.9 (New)	Adds Section 1507.8.9 “Label Required’ and 1507.9.9 “Label Required”. Labels need to be on the bundles of shakes and shingles so that building inspectors, contractors, architects, and owners can determine if the code compliant products are being installed. **Cost Impact:** Will not increase the cost of construction. Most bundles of shakes and shingles are appropriately labeled	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

		now, however some non-compliant products do not have a label, leaving questions as to suitability when being installed. Labels are required by the Cedar Shake and Shingle Bureau now, so manufactures are already adding this minor cost to the distribution of the products.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S40-16	1507.9.6, 1807.1.4, 2303.1.9	Modifies text of Table 1507.9.6 “Wood Shake Material Requirements”. Modifies text of Section 1807.1.4 “Permanent wood foundation systems” and 2303.1.9 “Preservative-treated wood”. The existing text was outdated, requiring clarification and updates to current AWPA section numbering **Cost Impact:** Will not increase the cost of construction. These **changes merely clarify and update the existing text without any impact** on the required specifications for materials used.	Same as change between 2015 IBC-B and 2018 IBC-B	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S43-16 Part I	1507.11.1, 1507.11.2, 1507.11.2.1 (New)	Modifies text of Section 1507.11.1 “Slope” and 1507.11.2 “Material standards”. Adds new Section 1507.11.2.1 “Base sheet”. The proposal includes a change to terminology for modified bitumen roofing materials for consistency with referenced	Same as change between 2015 IBC-B and 2018 IBC-B	

		standards and industry terminology. In addition, it includes a new section permitting the use of base sheet materials that comply with ASTM D 1970, ASTM D4601, or other standards as applicable. **Cost Impact:** Will not increase the cost of construction. The **proposal increases product options.**		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S44-16	1507.14.2	Modifies text of Section 1507.14.2". Revises section 1507.14.2 "Material standards". Adds new standard "ASTM D 7425/D 7425M—11 Standard Specification for Spray Polyurethane Foam Used for Roofing Application". The proposal adds in an alternate referenced standard applicable to spray-applied polyurethane foam insulation in roofing. **Cost Impact:** Will not increase the cost of construction. The **proposal increases options for material suppliers**; thus will increase product availability.	Same as change between 2015 IBC-B and 2018 IBC-B	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S47-16	1507.17.2 (New)	Adds Section 1507.17.2 "Deck Slope". This proposal revises the minimum roof deck slope for the installation of photovoltaic shingles. The minimum of 2:12 slope is in conformance with an accepted slope for these products in the International Residential Code. The section was also edited	This change is not similar to that of the FBC. The FBC provides for Florida specific	Overlapping provision to be considered during step 2 of the code change process

		for clarity. **Cost Impact:** Will not increase the cost of construction. This **proposal is a clarification** of roof deck requirements for PV shingles. It does not increase the cost of construction.	changes to this section	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S3-15	[BF] 1508.1.1, Table [BF] 1508.2	Deletes Section [BF] 1508.1.1 “Cellulosic fiberboard.” Modifies Table [BF] 1508.2 “MATERIAL STANDARDS FOR ROOF INSULATION.” The purpose of this code change is to clarify the intent of the code and to remove redundancy. As written, Section 1508.1.1 is a pointer to Chapter 23. Information in Chapter 23 related to wood fiberboard roof insulation is redundant to information already in Chapter 15 so the pointer does not serve a useful purpose. **Cost Impact:** Will not increase the cost of construction. The proposed **change is a clarification and does not change the stringency of existing code requirements** so the cost of construction will be unchanged.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S4-15	Table [BF] 1508.2	Modifies text of Table [BF] 1508.2 “MATERIAL STANDARDS FOR ROOF INSULATION”. The purpose of this change is to update the type designations listed for the ASTM standard currently referenced in the code for composite board roof	This change is not similar to that of the FBC. The FBC provides for	Overlapping provision to be considered during step 2 of the code change process

		insulation **Cost Impact:** Will not increase the cost of construction. The proposed **change is a clarification** and does not change the stringency of existing code requirements so the cost of construction will be unchanged.	Florida specific changes to this section	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S6-15	Table [BF] 1508.2	Modifies text of Table [BF] 1508.2 “MATERIAL STANDARDS FOR ROOF INSULATION”. The purpose of this change is to add a listing for high-density polyisocyanurate board roof insulation in Table 1508.2 **Cost Impact:** Will not increase the cost of construction. The proposed change is a **clarification** and does not change the stringency of existing code requirements so the cost of construction will be unchanged.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S7-15	1510.1.1 (New), [BG] 1510.2.1, [BG] 1510.2.2, [BG] 1510.2.3	Adds new text to Section 1510.1.1 “Area limitation”. Modifies text of [BG] 1510.2.1 “Height above roof deck” and [BG] 1510.2.3 “Use limitations”. Deletes old Section [BG] 1510.2.2 “ Area limitation.” **Cost Impact:** Will not increase the cost of construction. This proposal will not increase the cost of construction because it merely **reorganizes** and clarifies the existing code	Same as change between 2015 IBC-B and 2018 IBC-B	

		sections.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S9-15	1510.7.3	Deletes Section [BG] 1510.7.3 “Installation.” Section 1510.7.3 is redundant with Section 1510.7.4. **Cost Impact:** Will not increase the cost of construction. **Deleting redundant** text will have no impact on the cost of construction.	Same as change between 2015 IBC-B and 2018 IBC-B	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

G180-15	406.7.2, TABLE 601, 603.1, 705.2.3, 803.3, 803.13.3, 1406.3, [BG] 1510.2.5, [BG] 1510.3, 3105.3, D102.2.8, IFC 803.1	Modifies text of Section 406.7.2 “Canopies”, 603.1 “Allowable materials”, 705.2.3 “Combustible projections”, 803.3 “Heavy timber exemption”, 803.13.3 “Heavy timber construction”, 1406.3 “Balconies and similar projections”, [BG] 1510.2.5 “Type of construction”, [BG] 1510.3 “Tanks”, 3105.3 “Design and construction”, D102.2.8 “Permanent canopies”, IFC Section 803.1 “General”. Modifies TABLE 601 (601) “FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)” This change is a reorganization of two sections and is not intended to change the intent of the code. This code change is part 2 of a proposal to reorganize Type IV Section 602.4 and heavy timber section 2304.11. This part of the change	Same as change between 2015 IBC-B and 2018 IBC-B	

		includes references found throughout the IBC to either: Type IV construction, Section 602.4, Section 2304.11, or "heavy timber". This change should follow directly after the 602.4 change and the reason for the change is included in that reason statement. **Cost Impact:** Will not increase the cost of construction. Since this is **a reorganization of existing requirements**, not the creation of new requirements, this code change will not increase the cost of construction.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S49-16	[BG] 1510.7.1	Deletes Section [BG] 1510.7.1 “Wind resistance.” Per reasoning The expansion of Section 3111 in the International Building Code by Proposal G211-15 in the Group A cycle covers all that is within Section 1510.7 and its subsections, so Section 1501.7 is no longer needed. **Cost Impact:** Will not increase the cost of construction. This proposal will not increase the cost of construction, as it is intended **to coordinate the code** with prior action approved under Group A code development.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

S51-16 Part I	1511.3.1, 202 (New); IEBC: [BS]	Modifies text of Section 1511.3.1 “Roof recover”. Adds new definition to Section 202 “ROOF COATING”. Adds new	This change is not similar to that of	Overlapping provision to be considered during step 2 of the

	706.3.	section to IEBC definition Section “ROOF COATING”. Revises Section [BS] 706.3 “Recovering versus replacement.” The proposal clarifies the enforcement process by adding additional substrates (i.e., existing roof coverings) that are acceptable for the installation of a roof coating. This code change was further modified by the Committee. The modification makes necessary corrections to address industry concerns. The committee had some concern over the introduction of a laundry list in the new wording as well as the lack of a direct tie to the material standards in Chapter 15. **Cost Impact:** Will not increase the cost of construction. This will likely **reduce the cost** of construction when questions are raised about the appropriate use of a roof coating on existing roofs.	the FBC. The FBC provides for Florida specific changes to this section	code change process

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

Code Change No: G22-15

Original Proposal

Section(s): 304.2, 308.2, 310.2, 402.2, 406.2, 410.2, 411.2, 412.2, 423.2, 502.1, 702.1, 802.1, 902.1, 1002.1, 1102.1, 1202.1, 1402.1, 1502.1, 1602, 1602.1, 1609.2, 1612.2, 1613.2, 1615.2, 1702.1, 1802.1, 2102.1, 2202.1, 2302.1, 2402.1, 2502.1, 2602.1, 3102.2, 3105.2, 3110.2, 404.1.1, 408.1.1, 722.1.1, [F] 307.2, [F] 415.2, [F] 421.2

Proponent: Sarah Rice, Preview Group, representing Preview Group

Revise as follows:

304.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

~~**AMBULATORY CARE FACILITY.**~~
CLINIC, OUTPATIENT~~.~~

[F] 307.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~
(*The lists of terms in this and subsequent sections would be deleted.)*

308.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

310.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

402.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

404.1.1 Definition. ~~The following term is~~ Terms are defined in Chapter 2:

406.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~
408.1.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

410.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

411.2 Definition. ~~The following term is~~ Terms are defined in Chapter 2~~:~~

412.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~.~~

[F] 415.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

[F] 421.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

423.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~
502.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

702.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

722.1.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2:

802.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~
902.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

1002.1 Definitions. ~~The following terms~~Terms are defined in Chapter 2~~:~~

1102.1 Definitions. ~~The following terms~~Terms are defined in Chapter 2:

1202.1 General. ~~The following terms~~Terms are defined in Chapter 2~~:~~

1402.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~
1502.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

1602.1 Definitions~~.~~ and notations ~~The following terms~~ Terms are defined in Chapter 2, The following notations are used in this chapter:

1609.2 Definitions. ~~For the purposes of Section 1609 and as used elsewhere in this code, the following terms~~ Terms are defined in Chapter 2~~.~~

1612.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

1613.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

1615.2 Definitions. ~~The following words and terms~~ Terms are defined in Chapter 2~~:~~

1702.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

1802.1 Definitions. ~~The following words and terms~~ Terms are defined in Chapter 2~~:~~

2102.1 General. ~~The following terms~~ Terms are defined in Chapter 2. The following notations are used in the chapter:

2302.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

2402.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

2502.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

2602.1 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

3102.2 Definitions. ~~The following terms~~ Terms are defined in Chapter 2~~:~~

3105.2 Definition. ~~The following term is~~ Terms are defined in Chapter 2~~:~~

3110.2 Definition. ~~The following term is~~ Terms are defined in Chapter 2~~:~~

Reason: The intent of this proposal is to remove the definition list sections scattered about the code and the lists of defined terms included within each such section. Starting with the 2012 edition of the IBC all of the definitions were consolidated into Chapter 2. These sections are vestigages of historic organization of the code. In general when new terms are added to Chapter 2, they rarely find themselves being added to one of these lists. Terms can be removed from Chapter 2, but don't always get removed from these lists. Most of the ICC codes simply have a Chapter 2 of definitions, there are no lists scattered about the code. It is time to remove these lists. I see this as an editorial action. The proposal was not accepted by the Code Correlation Committee because of a concern that the language in each section implied that all terms were defined. I have revised that language to provide a simple reference for defined terms.
This proposal simply amends the sections to remove the lists and send the code users directly to Chapter 2. An alternative the committee might consider is to delete all of these sections (except the two that list notations). Deletion would force renumber of the balance of the sections in these chapters.
In two sections, these lists also contain a list of scientific notations used in the chapter. Those notations are not found in Chapter 2. Thus the current text is incorrect and needs to be addressed. The proposal retains Section 1602 and 2102, but only for the listed notations.

Cost Impact: Will not increase the cost of construction
The proposal is purely editorial in nature and will have no impact on actual construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The proposal reduces redundancy in the code and simplifies the search for information. With each defined term italicized, the code user will go directly to Chapter 2 where the full definitions are found. The listings in front of the chapter provided no information for the code user. The intent of the committee was to change to the lists to a simple reference to Chapter 2 with the exception of those locations where the lists also included scientific notations. The notations would remain in the Chapters.

Assembly Action: **None**

Public Comments

Public Comment 1:

Maureen Traxler, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov) requests Approve as Modified by this Public Comment.

Modify as follows:

~~**304.2 Definitions. Terms are defined in Chapter 2.**~~

~~**[F] 307.2 Definitions. Terms are defined in Chapter 2**~~

~~**308.2 Definitions. Terms are defined in Chapter 2**~~

~~**310.2 Definitions. Terms are defined in Chapter 2**~~

~~**402.2 Definitions. Terms are defined in Chapter 2**~~

~~**404.1.1 Definition. Terms are defined in Chapter 2:**~~

~~**406.2 Definitions. Terms are defined in Chapter 2**~~

~~**408.1.1 Definitions. Terms are defined in Chapter 2**~~

~~**410.2 Definitions. Terms are defined in Chapter 2**~~

~~**411.2 Definition. Terms are defined in Chapter 2**~~

~~**412.2 Definitions. Terms are defined in Chapter 2**~~

~~**[F] 415.2 Definitions. Terms are defined in Chapter 2**~~

~~**[F] 421.2 Definitions. Terms are defined in Chapter 2**~~

~~**423.2 Definitions. Terms are defined in Chapter 2**~~

~~**SECTION 502**~~
~~**DEFINITIONS**~~

~~**502.1 Definitions. Terms are defined in Chapter 2**~~

~~**SECTION 702**~~
~~**DEFINITIONS**~~

~~**702.1 Definitions. Terms are defined in Chapter 2**~~

~~**722.1.1 Definitions. Terms are defined in Chapter 2:**~~

~~**SECTION 802**~~

~~DEFINITIONS~~

~~802.1 Definitions. Terms are defined in Chapter 2~~

~~SECTION 902~~
~~DEFINITIONS~~

~~902.1 Definitions. Terms are defined in Chapter 2~~

~~SECTION 1002~~
~~DEFINITIONS~~

~~1002.1 Definitions. Terms are defined in Chapter 2~~

~~SECTION 1102~~
~~DEFINITIONS~~

~~1102.1 Definitions. Terms are defined in Chapter 2:~~

~~SECTION 1202~~
~~DEFINITIONS~~

~~1202.1 General. Terms are defined in Chapter 2~~

~~SECTION 1402~~
~~DEFINITIONS~~

~~1402.1 Definitions. Terms are defined in Chapter 2~~

~~SECTION 1502~~
~~DEFINITIONS~~

~~1502.1 Definitions. Terms are defined in Chapter 2~~

~~SECTION 1602~~
~~DEFINITIONS AND NOTATIONS~~

~~1609.2 Definitions. Terms are defined in Chapter 2~~

~~1612.2 Definitions. Terms are defined in Chapter 2~~

~~1615.2 Definitions. Terms are defined in Chapter 2~~

~~1613.2 Definitions. Terms are defined in Chapter 2~~

~~SECTION 1702~~
~~DEFINITIONS~~

~~1702.1 Definitions. Terms are defined in Chapter 2~~

~~SECTION 1802~~
~~DEFINITIONS~~

~~1802.1 Definitions. Terms are defined in Chapter 2~~

~~SECTION 2102~~
~~DEFINITIONS AND NOTATIONS~~

~~2102.1 General. Notations Terms are defined in Chapter 2. The following notations are used in the chapter:~~

~~SECTION 2202~~
~~DEFINITIONS~~

~~2202.1 Definitions. The following terms are defined in Chapter 2:~~

~~SECTION 2302~~
~~DEFINITIONS~~

~~2302.1 Definitions. Terms are defined in Chapter 2~~

~~**SECTION 2402**~~
~~**DEFINITIONS**~~

~~**2402.1 Definitions. Terms are defined in Chapter 2**~~

~~**SECTION 2502**~~
~~**DEFINITIONS**~~

~~**2502.1 Definitions. Terms are defined in Chapter 2**~~

~~**SECTION 2602**~~
~~**DEFINITIONS**~~

~~**2602.1 Definitions. Terms are defined in Chapter 2**~~

~~**3102.2 Definitions. Terms are defined in Chapter 2**~~

~~**3105.2 Definition. Terms are defined in Chapter 2**~~

~~**3110.2 Definition. Terms are defined in Chapter 2**~~

Commenter's Reason: This comment deletes the definitions sections from all the chapters except Chapter 2. The original proposal deletes the lists of defined terms but leaves the statement "Terms are defined in Chapter 2." While we agree wholeheartedly with the spirit of the original proposal, we would like to take it to its logical conclusion and delete the entire sections. The text added in the original proposal doesn't add anything to the code; it's only purpose is to avoid renumbering the chapters. Everyone who has basic knowledge about the organization of the IBC, or who understands why terms are italicized knows that terms are defined in Chapter 2. For Sections 1602.1 and 2102.1, this comment lists the definitions that should be deleted in order to be very clear that the notations must remain in those sections.

Commenter's Reason: The essence of a sleeping unit is that it's a place where people sleep. In the original proposal, provisions for sleeping are optional--this comment makes sleeping accommodations a mandatory feature of a sleeping unit.

Final Hearing Results

G22-15 **AMPC1**

Back

Code Change No: S1-15

Original Proposal

Section: [BF] 1505.10

Proponent: Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

THIS PROPOSAL WAS HEARD BY THE FIRE SAFETY COMMITTEE.

Revise as follows:

[BF] 1505.10 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with Section 1505.1, Section 1507.16 and shall be installed in accordance with ANSI/SPRI VF-1.

Reason: The purpose of this code change is to clarify the intent of the code. As written, Section 1505.10 could be interpreted as an exception to the other parts of Section 1505. The proposed change clarifies the fire classification requirements in Section 1505 apply to roof gardens and landscaped roofs.

Cost Impact: Will not increase the cost of construction
The proposed change is a clarification and does not change the stringency of existing code requirements so the cost of construction will be unchanged.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that Section 1505.10 could be interpreted as an exception to the other parts of Section 1505. Therefore the inclusion of Section 1505 to apply to roof gardens and landscaped roofs is appropriate.

Assembly Action **None**

Final Hearing Results

S1-15	**AS**

Back

Code Change No: S2-15

Original Proposal

Section(s): [BF] 1505.9, Chapter 35

Proponent: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

THIS PROPOSAL WAS HEARD BY THE FIRE SAFETY COMMITTEE.

Revise as follows:

[BF] 1505.9 ~~Photovoltaic panels and modules~~ Rooftop mounted photovoltaic panel systems.
Rooftop-mounted *photovoltaic panel systems* shall be tested, *listed* and identified with a fire classification in accordance with UL 1703 or UL 2703. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.

Add new standard(s) as follows:

UL 2703-14, Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels

Reason: The position of the photovoltaic panels, as well as the slope of the roof, are critical factors in determining the fire classification of a photovoltaic panel system. The position of the photovoltaic panels is established by the racking system. Thus, the testing for photovoltaic panel systems are covered in both UL 1703 and UL 2703. The new UL 2703 standard, which is an ANSI consensus standard, provides the test method for testing multiple panels for each racking system. Either standard can be used to establish a fire classification of the photovoltaic panel system.

Cost Impact: Will not increase the cost of construction
This will provide another method to test photovoltaic systems for fire classification.

Analysis: A review of the standard proposed for inclusion in the code, UL 2703, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2015.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that the new UL 2703 standard was appropriate and provides the test method for testing multiple panels for each racking system and that either standard can be used to establish a fire classification of the photovoltaic panel system.

Assembly Action: **None**

Public Comments

Public Comment 2:

Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net) requests Approve as Modified by this Public Comment.

Modify as follows:

[BF] 1505.9 Rooftop mounted photovoltaic panel systems Rooftop rack-mounted *photovoltaic panel systems* shall be tested, *listed* and identified with a fire classification in accordance with UL 1703 ~~or~~ and UL 2703. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.

Commenter's Reason: The purpose of this public comment is to clarify S2-15. The proponent's code change allows UL 2703 to be used for rooftop-mounted photovoltaic panel systems to be tested, listed and identified with a fire classification. This would allow rooftop rack-mounted photovoltaic panel systems with photovoltaic modules that do not meet UL 1703 (the code's current requirement) to comply with IBC 2018.

The scope of UL 2703 states in Section 1.1 "...Systems, components and/or devices evaluated under this standard **may** be used to ground and/or mount a PV module **complying with UL 1703** when the specific module or frame has been evaluated for bonding/grounding or the module has been evaluated for mounting with the evaluated system, component or device." [Note: bold text in this quote is for emphasis. The bold text does not appear in the standard]

UL 2703 references UL 1703 but does not in fact require compliance with UL 1703 for PV modules used in rooftop-mounted photovoltaic panel systems. This public comment ensures that all PV modules used on rooftops will be tested, listed and identified with a fire classification in accordance with the level of performance listed in the current code.

Final Hearing Results

S2-15 **AMPC2**

Back

Code Change No: S1-16

Original Proposal

Section: 1401.1, 1501.1

Proponent: Dennis Richardson, American Wood Council, representing American Wood Council (drichardson@awc.org)

Revise as follows:

1401.1 Scope. The provisions of this chapter shall establish the minimum requirements for exterior walls; *exterior wall* coverings; *exterior wall* openings; exterior windows and doors; and architectural *trim*.~~; balconies and similar projections; and bay and oriel windows.~~

1501.1 Scope. The provisions of this chapter shall govern the design, materials, construction and quality of roof assemblies, ~~and~~ rooftop structures, and balconies where the structural framing is protected by an impervious moisture barrier.

Reason: Provisions regarding ventilation for balconies that are protected by an impervious barrier yet are located outside of the building envelope are being added to Chapter 15 (new Section 1503.7) under a seperate proposal. Since a balcony outside of the building envelope that has weather protection and supports loads most closely resembles a roof (see definition of roof assembly in IBC Section 202), it is felt chapter 15 is the most appropriate place for this provision. This code change revises the scoping statement of Chapter 15 to reflect this and also corrects the scoping statement in Chapter 14 Section 1401 that was not modified when Group A code change FS15-15 removed Balconies, similar projections and Bay and oriel windows from Chapter 14.

Cost Impact: Will not increase the cost of construction
This code change merely clarifies the scoping of chapters and references needing correction from a previous code change and does not change any provision of the code affecting cost.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

1501.1 Scope. The provisions of this chapter shall govern the design, materials, construction and quality of roof assemblies, and rooftop structures~~, and balconies where the structural framing is protected by an impervious moisture barrier~~.

Committee Reason: Since all balcony provisions were previously moved from Chapter 14 to Chapter 7, the revision to the scope of Chapter 14 is a good catch. The modification does away with the proposed change to the scope of Chapter 15, retaining only the current wording.

Assembly Action **None**

Final Action Results

S1-16 **AM**

Back

Code Change No: S2-16

Original Proposal

Section: 1503.1, 1503.2

Proponent: Mike Fischer, Kellen, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

Revise as follows:

1503.1 General. Roof decks shall be covered with *approved* roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof coverings shall be designed in accordance with this code, and installed in accordance with this code and the ~~*approved*~~ manufacturer's *approved* instructions ~~such that the roof covering shall serve to protect the building or structure~~.

1503.2 Flashing. Flashing shall be installed in such a manner so as to prevent ~~moisture~~ liquid water from entering the wall and roof through joints in copings, through moisture-permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

Reason: The current code includes references to "approved manufacturer's instructions" which tends to indicate that it is addressing instructions from approved manufacturers. Since it is the instructions that are approved, not the manufacturer, the proposed text is grammatically correct. The proposal further removes the phrase regarding protection of "the building or structure" which is undefined and vague, and changes the term "moisture" (which could include water vapor) to "liquid water" to more correctly capture the role of flashing materials and assemblies.

Cost Impact: Will not increase the cost of construction
The proposal adds no additional mandatory requirements.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee agrees that this code change clarifies this provision, noting that it moves the word "approved" to a better place.

Assembly Action **None**

Final Action Results

S2-16	**AS**

Back

Code Change No: S7-16

Original Proposal

Section(s): 2304.12.2.6 (New)

Proponent: Dennis Richardson, American Wood Council, representing American Wood Council (drichardson@awc.org)

Add new text as follows:

1503.7 Ventilation required beneath balcony or elevated walking surfaces. Enclosed framing in exterior balconies and elevated walking surfaces that are exposed to rain, snow, or drainage from irrigation, where the structural framing is protected by an impervious moisture barrier, shall be provided with openings that provide a net free cross ventilation area not less than 1/150 of the area of each separate space. Where framing supports such surfaces over 30 inches (762 mm) above grade, the ventilation openings shall be designed to allow inspection of framing material.

Reason: This change clarifies the intent of the code when a balcony or elevated walking surface serves as a weather resistant barrier and the joist spaces below are enclosed, cross ventilation is required as for enclosed rafter spaces of roofs. When the ventilation is provided for elevated walking surfaces, the ventilation openings must be designed to accommodate routine inspection of the framing material for decay or corrosion.

Cost Impact: Will increase the cost of construction
Some vent openings may need to be modified to accommodate inspection of framing material. Many vent covers that are easily removable and re-installed with hand tools already comply with the intent of this requirement.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee understands there is a problem that needs to be addressed, but believes the proposed requirement should only apply to wood and possibly light-gage steel. The fire-rating issues need to be correlated, probably in one big change, so that they allow these openings if they are small so that the inspections can be made and ventilation can be provided. As written this would be creating a conflict in the code. The committee would like to see more specificity on the inspection portals, giving some guidance to building officials. There is a concern that this is not the right location for this provision since most people would not think of walking surfaces as part of roofing. In addition it is not completely clear whether the problem that is being addressed is code-related versus something that was a construction defect.

Assembly Action: **None**

Public Comments

Public Comment 1:

Dennis Richardson, representing American Wood Council (drichardson@awc.org) requests Approve as Modified by this Public Comment.

Modify as follows:

~~**1503.7**~~ **2304.12.2.6 Ventilation required beneath balcony or elevated walking surfaces.** Enclosed framing in exterior balconies and elevated walking surfaces that are exposed to rain, snow, or drainage from irrigation~~, where the structural framing is protected by an impervious moisture barrier,~~ shall be provided with openings that provide a net free cross ventilation area not less than 1/150 of the area of each separate space. ~~Where framing supports such surfaces over 30 inches (762 mm) above grade, the ventilation openings shall be designed to allow inspection of framing material.~~

Commenter's Reason: Section 1203.3 of the IBC is generally applied by many to require ventilation in the instance where wood supports a balcony and is enclosed. A key word is enclosed. Whenever the wood framing supporting such structures is enclosed it is more difficult for water in the assembly to dry out regardless of the source of the water (even if remaining from rain during the construction period). Even though section 1203.3 is generally applied by many, there is no specific reference to this application. It is critical to provide ventilation to these areas when enclosed and the wood supports an elevated balcony exposed to the weather. The committee suggested this change needed to be located where it is clear it applies to wood hence the change to chapter 23. The committee also suggested this needs to be correlated with fire-rating issues and this code change proposal could create an inconsistency. That is incorrect as Section 1406.3 of the 2015 IBC makes it clear how fire-rating issues can be resolved with the current code by extending sprinkler protection to these areas (1406.3 will be relocated in the 2018 IBC):

Section 1406.3, Exception 3: "Balconies and similar projections on buildings of Type III, IV and V construction shall be permitted to be of Type V construction, and shall not be required to have a fire resistance rating where sprinkler protection is extended to these areas."

Finally the original code change went a step further to introduce the concept of providing ventilation openings that allow the inspection for decay. This is a concept that has been introduced and is being tested by one jurisdiction where there was a balcony failure. The concept is valid but still being perfected so it has been removed from this proposal and may need to be addressed with a future code change when it is ready for prime time.

Information on this and other code change proposals by American Wood Council may be found at the following web address: www.woodcode.org .

Final Action Results

S7-16	AMPC1

Code Change No: S8-16 Part I

Original Proposal

Section: IBC: 1504.1.1

Proponent: Mike Fischer, Kellen, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1504.1.1 Wind resistance of asphalt shingles. Asphalt shingles shall be tested in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table 1504.1.1 for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table 1504.1.1.

Exception: Asphalt shingles ~~that are~~ not included in the scope of ASTM D 7158 shall be tested and labeled in accordance with ASTM D 3161. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 3161 and the required classification in Table 1504.1.1.

Reason: This proposal is an editorial clarification that aligns the labeling requirement for the wind standards for asphalt shingles to provide consistent labeling requirements between the IRC and IBC.

Cost Impact: Will not increase the cost of construction
The proposal is editorial and adds no new requirements.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This code change makes an editorial change that wil clarify the labeling requirements for asphalt shingles.

Assembly Action **None**

Final Action Results

S8-16 Part I	**AS**

Back

Code Change No: S9-16

Original Proposal

Section: 1504.2.1.1

Proponent: Rob Brooks, Rob Brooks and Associates, LLC representing Dow Building Solutions, representing Rob Brooks and Associates, LLC representing Dow Building Solutions (rob.brooks.mail@gmail.com)

Revise as follows:

1504.2.1.1 Overturning resistance. Concrete and clay roof tiles shall be tested to determine their resistance to overturning due to wind in accordance with SBCCI SSTD 11 or ASTM C 1568, and Chapter 15.

Reference standards type: This reference standard is new to the ICC Code Books
Add new standard(s) as follows:

ASTM C1568-08(2013), *Standard Test Method for Wind Resistance of Concrete and Clay Roof Tiles (Mechanical Uplift Resistance Method)*

Reason: In 2003, ASTM International Subcommittee C15.06 replicated SSTD 11-99 by subdividing the SBCCI standard into three different ASTM standards: 1) ASTM C1568-03, *Standard Test Method for Wind Resistance of Concrete and Clay Roof Tiles (Mechanical Uplift Resistance Method)*, 2) ASTM C1569-03, *Standard Test Method for Wind Resistance of Concrete and Clay Roof Tiles (Wind Tunnel Method)*, and 3) ASTM C1570-03, *Standard Test Method for Wind Resistance of Concrete and Clay Roof Tiles (Air Permeability Method)*.

The cross-correlation of ASTM C1568 and SSTD 11 is as follows:
C1568 Section 5 relates to SSTD 11 Section 201
C1568 Section 6 relates to SSTD 11 Sections 202, 204 and 205
C1568 Section 7 relates to SSTD 11 Section 203
C1568 Section 8 relates to SSTD 11 Section 206
C1568 Section 9 relates to SSTD 11 Section 207
C1568 Section 10 relates to SSTD 11 Section 300
C1568 Section 11 relates to SSTD 11 Section 400
C1568 Section 12 relates to SSTD 11 Section 500
C1568 Section 13 relates to SSTD 11 Section 600
C1568 Section 14 relates to SSTD 11 Section 700

There are no technical changes proposed with this code change request. ASTM C1568 is simply a duplication of the relevant sections of SSTD 11-99 with regard to the mechanical uplift resistance method. This modification now references a consensus standard that will have the capability to be updated in the future, as SSTD 11 has not been updated since 1999.

Bibliography: Additional information on the background and development of the ASTM standards is available at http://www.rci-online.org/interface/2014-11-smith-masters-gurley.pdf

Cost Impact: Will not increase the cost of construction
The ASTM standard replicates the current requirements of SBCCI SSTD-99, and therefore will increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM C1568, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2016.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

1504.2.1.1 Overturning resistance. Concrete and clay roof tiles shall be tested to determine their resistance to overturning due to wind in accordance with Chapter 15 and either SBCCI SSTD 11 or ASTM C 1568~~, and Chapter 15~~.

Committee Reason: The proposal adds an alternative referenced standard for determining the overturning resistance of clay and concrete roof tiles. The modification clarifies that you still have to comply with Chapter 15 as well as one of the referenced standards.

Assembly Action **None**

Final Action Results

S9-16 **AM**

Back

Code Change No: S11-16

Original Proposal

Section: 1504.3

Proponent: Mike Ennis, SPRI Inc., representing SPRI Inc. (m.ennis@mac.com)

Revise as follows:

1504.3 Wind resistance of nonballasted roofs. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section ~~1609~~ 1609.5.2. The wind load on the roof covering shall be determined using allowable stress design.

Reason: This proposal is being submitted to provide clarification regarding how to calculate wind loads on roof coverings. The introduction of ASCE 7-10 into the IBC, and its use of ultimate design wind speeds has caused confusion with design professionals when calculating wind loads on roof coverings. This proposal does not change any requirements, it simply clarifies that allowable stress wind loads shall be used for roof coverings.

Cost Impact: Will not increase the cost of construction
This proposal is a clarification regarding how to calculate wind loads on roof coverings. It will have no impact on the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

1504.3 Wind resistance of nonballasted roofs. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609.5.2. The wind load on the roof covering shall be permitted to be determined using allowable stress design.

Committee Reason: The committee recognizes there is some confusion and stating that allowable stress design is permitted to be used for roof coverings will help clarify this. Doing so will assist architects, building officials and the roofing industry. The modification provides the clarification that allowable stress design is permitted and that it is an option, not mandatory.

Assembly Action **None**

Final Action Results

S11-16	**AM**

Back

Code Change No: S14-16

Original Proposal

Section: 1504.1.1, 1504.3.3 (New)

Proponent: Andy Williams (afwilliams@Connect2amc.com)

Revise as follows:

TABLE 1504.1.1
CLASSIFICATION OF ~~ASPHALT~~ STEEP SLOPE ROOF SHINGLES TESTED IN ACCORDANCE WITH ASTM D 7158 OR D 3161

(Portions of table not shown remain unchanged)
For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.
a. The standard calculations contained in ASTM D 7158 assume Exposure Category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

Add new text as follows:

1504.3.3 Metal roof shingles. Metal roof shingles applied to a solid or closely fitted deck shall be tested in accordance with FM 4474, UL 580, UL 1897, or ASTM D 3161. Metal roof shingles tested in accordance with ASTM D 3161 shall meet the classification requirements of Table 1504.1.1 for the appropriate maximum basic wind speed and the metal shingle packaging shall bear a label to indicate compliance with ASTM D 3161 and the required classification in Table 1504.1.1.

Reference standards type: This is an update to reference standard(s) already in the ICC Code Books

Add new standard(s) as follows:

ASTM D3161/D3161M-~~13~~ 15: Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method)

Reason:

- This proposal separates "metal roof shingles" as a separate line item product in Section 1504, specifically under the non-ballasted roof systems provisions.
- This proposal also modifies the title of Table 1504.1.1 only as the table is appropriate to steep slope roofs other than asphalt shingles based on the modifications that first appeared in the 2013 Edition of ASTM Standard D3161.
- This proposal further modifies the ASTM standard to the 2015 edition.

This proposal would create a separate line item for metal roof shingles based on the fact that metal shingles are not the same in all respects as either asphalt shingles (Section 1504.1.1) or the other roof systems (Section 1504.3.1) provisions.
One of the major considerations for this product type is the wind uplift testing which is addressed by several industry standards including FM, UL, and ASTM. The majority of manufacturers use one or more of these standards and we propose that the choice should remain with the manufacturer to demonstrate compliance.

ASTM D3161 is a fan-induced wind test that was originally developed for asphalt shingles. The most recent version, ASTM D3161M-15, is no longer constrained to asphalt shingles, but expanded to evaluate wind resistance of discontinuous, air permeable, steep slope roofing products that results from the product's rigidity, with or without contribution from sealant or other adhesive to help hold down the leading edge of the tabs, or mechanical interlocking, with or without contribution from sealant or other adhesive to hold down the leading edge of the tab, or any combination thereof." This would clearly include metal shingles which are specifically identified in Scope Section 1.3.

Inclusion of this standard as a compliance path for metal shingles would alleviate many of the difficulties experienced by metal shingle manufacturers when required by current code language to conduct either UL 1897 or UL 580 in a non-air-permeable fashion that does not fairly represent this product class. Underwriter's Laboratories has provided metal shingle wind classifications using earlier versions of ASTM D3161 for many years, and currently has D3161-related metal shingles in their Online Classification Directory and UL was also a proponent of the scope change to D3161. These points illustrate UL's acceptance of D3161 as a viable means to demonstrate wind resistance of metal shingles.

The scope of ASTM D3161M-15 is very clear in Section 1.3 where it states "This test method was formerly titled "Wind Resistance of Asphalt Shingles (Fan-Induced Method)" but was revised to acknowledge that the method is applicable to many other steep slope roofing products and has been used to evaluate the wind resistance of those products for many years by several testing and certification laboratories."

Cost Impact: Will not increase the cost of construction
This proposal would allow an alternate testing method which should add no cost to construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Now that the referenced standard has been updated to include metal roof shingles, the requirements need to be added to the code. These are now consistent with other roofing products in the way they are being tested and the requirements for labeling. There is a question on the correct location for the new section as it will be confusing to locate these requirements with non-ballasted roofs.

Assembly Action **None**

Final Action Results

S14-16 **AS**

Back

Code Change No: S18-16 Part I

Original Proposal

Section: IBC: 1504.7, 1507.11.2, 1507.12.2, 1507.13.2

Proponent: Mike Fischer, Kellen, representing Asphalt Roofing Manufacturers Association., representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1504.7 Impact resistance. Roof coverings installed on low-slope roofs (roof slope < 2:12) in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, ~~CGSB 37-GP-52M~~ or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470.

1507.11.2 Material standards. Modified bitumen roof coverings shall comply with ~~CGSB 37-GP-56M,~~ ASTM D 6162, ASTM D 6163, ASTM D 6164, ASTM D 6222, ASTM D 6223, ASTM D 6298 or ASTM D 6509.

1507.12.2 Material standards. Thermoset single-ply roof coverings shall comply with ASTM D 4637~~,~~ or ASTM D 5019 ~~or CGSB 37-GP-52M~~.

1507.13.2 Material standards. Thermoplastic single-ply roof coverings shall comply with ASTM D 4434, ASTM D 6754, or ASTM D 6878 ~~or CGSB CAN/CGSB 37-54~~.

Reason: The proposal removes withdrawn Canadian standards.

Cost Impact: Will not increase the cost of construction
The referenced standards have been withdrawn and are invalid.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This code change removes a referenced standard that has been withdrawn.

Assembly Action **None**

Final Action Results

S18-16 Part I	**AS**

Back

Code Change No: S21-16

Original Proposal

Section: 1504.8

Proponent: Edward Kulik, representing Building Code Action Committee (bcac@iccsafe.org)

Revise as follows:

1504.8 ~~Aggregate~~ Surfacing and ballast materials in hurricane-prone regions. ~~Aggregate used as surfacing for roof coverings and aggregate, gravel or stone used as ballast shall not be used on the roof of~~ For a building located in a hurricane-prone region as defined in Section 202, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the site~~.~~, the following materials shall not be used on the roof:

1. Aggregate used as surfacing for roof coverings
2. Aggregate, gravel or stone used as ballast

Reason: This proposal removes a run on sentence to allow for more consistent interpretation and enforcement. This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2014 and 2015 the BCAC has held 5 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: **BCAC**

Cost Impact: Will not increase the cost of construction
No increase to the cost of construction as this is a clarification of current requirements.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal rewords Section 1504.8, providing a clarification of the current requirements.

Assembly Action **None**

Final Action Results

S21-16 **AS**

Back

Code Change No: S56-16

Original Proposal

Section: 1602.1, 1603.1, 1603.1.4, 1609.1.1, 1609.1.1.1, 1609.1.2.2, 1609.2, 1609.3, 1609.3(3) (New), 1609.3(5) (New), 1609.3(6) (New), 1609.3(7) (New), 1609.3(8) (New), 1609.3.1, 202, 2308.2.4, 2404.1, 2404.2, 2404.3.1, 2404.3.3, 2404.3.5, 2405.5.2

Proponent: Jennifer Goupil, AMERICAN SOCIETY OF CIVIL ENGINEERS, representing SELF (jgoupil@asce.org)

Revise as follows:

1602.1 Definitions. The following terms are defined in Chapter 2:

NOTATIONS.

D	=	Dead load.
D_i	=	Weight of ice in accordance with Chapter 10 of ASCE 7.
E	=	Combined effect of horizontal and vertical earthquake induced forces as defined in Section 12.4.2 of ASCE 7.
F	=	Load due to fluids with well-defined pressures and maximum heights.
F_a	=	Flood load in accordance with Chapter 5 of ASCE 7.
H	=	Load due to lateral earth pressures, ground water pressure or pressure of bulk materials.
L	=	Roof live load greater than 20 psf (0.96 kN/m ^{2}) and floor live load.
L_r	=	Roof live load of 20 psf (0.96 kN/m ^{2}) or less.
R	=	Rain load.
S	=	Snow load.
T	=	Self-straining load.
V_{asd}	=	~~Nominal~~ Allowable stress design wind speed ~~(3-second gust)~~, miles per hour (mph) (km/hr) where applicable.
V~~ult~~	=	~~Ultimate~~ Basic design wind speeds ~~(3-second gust)~~, miles per hour (mph) (km/hr) determined from Figure 1609.3(1)~~, 1609.3(2), 1609.3(3~~ to 1609.3(8) or ASCE 7.

W	=	Load due to wind pressure.
W_i	=	Wind-on-ice in accordance with Chapter 10 of ASCE 7.

1603.1 General. *Construction documents* shall show the size, section and relative locations of structural members with floor levels, column centers and offsets dimensioned. The design loads and other information pertinent to the structural design required by Sections 1603.1.1 through 1603.1.8 shall be indicated on the *construction documents*.

Exception: *Construction documents* for buildings constructed in accordance with the *conventional light-frame construction* provisions of Section 2308 shall indicate the following structural design information:

1. Floor and roof live loads.
2. Ground snow load, P_g.
3. ~~Ultimate~~ Basic design wind speed, V_{ult}, ~~(3-second gust),~~ miles per hour (mph) (km/hr) and ~~nominal~~ allowable stress design wind speed, V_{asd}, as determined in accordance with Section 1609.3.1 and wind exposure.
4. *Seismic design category* and *site class*.
5. Flood design data, if located in *flood hazard areas* established in Section 1612.3.
6. Design load-bearing values of soils.

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral force-resisting system of the structure:

1. ~~Ultimate~~ Basic design wind speed, V_{ult}, ~~(3-second gust),~~ miles per hour (km/hr) and ~~nominal~~ allowable stress design wind speed, V_{asd}, as determined in accordance with Section 1609.3.1.
2. *Risk category*.
3. Wind exposure. Applicable wind direction if more than one wind exposure is utilized.
4. Applicable internal pressure coefficient.
5. Design wind pressures to be used for exterior component and cladding materials not specifically designed by the *registered design professional* responsible for the design of the structure, psf (kN/m^2).

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the ~~ultimate~~basic design wind speed, V_{ult}, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AWC WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas, provided the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment.
6. Wind tunnel tests in accordance with ASCE 49 and Sections 31.4 and 31.5 of ASCE 7.

The wind speeds in Figures 1609.3(1)~~, 1609.3(2) and 1609.3(3~~ thorough 1609.3(8) are ~~ultimate~~ basic design wind speeds, V_{ult}, and shall be converted in accordance with Section 1609.3.1 to ~~nominal~~ allowable stress design wind speeds, V_{asd}, when the provisions of the standards referenced in Exceptions 4 and 5 are used.

1609.1.1.1 Applicability. The provisions of ICC 600 are applicable only to buildings located within Exposure B or C as defined in Section 1609.4. The provisions of ICC 600, AWC WFCM and AISI S230 shall not apply to buildings sited on the upper half of an isolated hill, ridge or escarpment meeting the following conditions:

1. The hill, ridge or escarpment is 60 feet (18 288 mm) or higher if located in Exposure B or 30 feet (9144 mm) or higher if located in Exposure C;
2. The maximum average slope of the hill exceeds 10 percent; and
3. The hill, ridge or escarpment is unobstructed upwind by other such topographic features for a distance from the high point of 50 times the height of the hill or ~~1 mile~~ 2 miles (~~1.61~~3.22 km), whichever is greater.

1609.1.2.2 Application of ASTM E 1996. The text of Section 6.2.2 of ASTM E 1996 shall be substituted as follows:

6.2.2 Unless otherwise specified, select the wind zone based on the ~~strength~~ basic design wind speed, V_{ult}, as follows:
6.2.2.1 *Wind Zone 1*—130 mph ≤ ~~ultimate~~ basic design wind speed, V_{ult}< 140 mph.
6.2.2.2 *Wind Zone 2*—140 mph ≤ ~~ultimate~~ basic design wind speed, V_{ult}< 150 mph at greater than one mile (1.6 km) from the coastline. The coastline shall be measured from the mean high water mark.
6.2.2.3 *Wind Zone 3*—150 mph (58 m/s) ≤ ~~ultimate~~ basic design wind speed, V_{ult}≤ 160 mph (63 m/s), or 140 mph (54 m/s) ≤ ~~ultimate~~ basic design wind speed, V_{ult} ≤ 160 mph (63 m/s) and within one mile (1.6 km) of the coastline. The coastline shall be measured from the mean high water mark.
6.2.2.4 *Wind Zone 4*— ~~ultimate~~ basic design wind speed, V_{ult} >160 mph (63 m/s).

1609.2 Definitions. For the purposes of Section 1609 and as used elsewhere in this code, the following terms are defined in Chapter 2.

HURRICANE-PRONE REGIONS.
WIND-BORNE DEBRIS REGION.
BASIC WIND SPEED, V_{ult}.
ALLOWABLE STRESS WIND SPEED, V_{asd}.

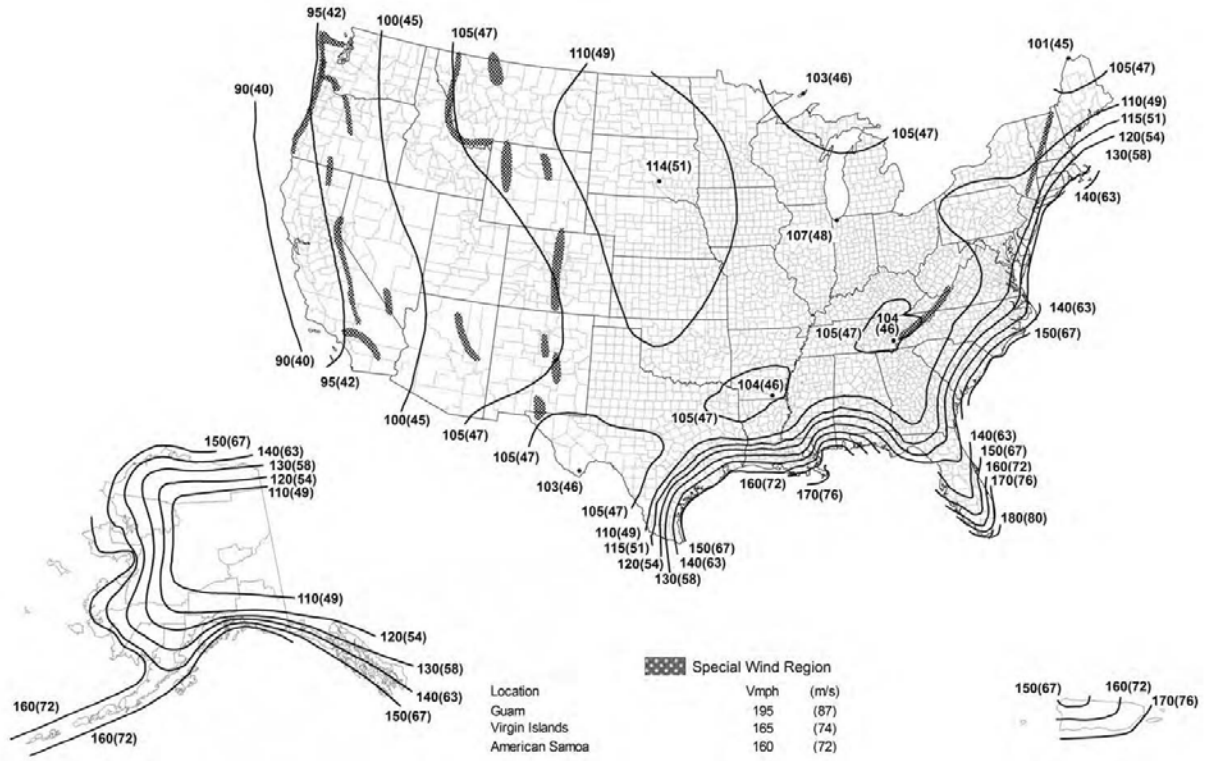
1609.3 ~~Ultimate~~ Basic design wind speed. The ~~ultimate~~ basic design wind speed, V_{ult}, in mph, for the determination of the wind loads shall be determined by Figures 1609.3(1)~~, 1609.3(2) and 1609.3(3~~ through (8). The ~~ultimate~~ basic design wind speed, V_{ult}, for use in the design of Risk Category II buildings and structures shall be obtained from Figure 1609.3(1) and (5). The ~~ultimate~~ basic design wind speed, V_{ult}, for use in the design of Risk Category III buildings and structures shall be obtained from Figure 1609.3(2) and (6). The basic design wind speed, *V*, for use in the design of Risk Category IV buildings and structures shall be obtained from Figure ~~1609.3(2~~1609.3(3) and (7). The ~~ultimate~~ basic design wind speed, V_{ult}, for use in the design of Risk Category I buildings and structures shall be obtained from Figure ~~1609.3(3~~1609.3(4) and (8). The ~~ultimate~~ basic design wind speed, V_{ult}, for the special wind regions indicated near mountainous terrain and near gorges shall be in accordance with local jurisdiction requirements. The ~~ultimate~~ basic design wind speeds, V_{ult}, determined by the local jurisdiction shall be in accordance with ~~Section 26.5.1~~ Chapter 26 of ASCE 7.

In nonhurricane-prone regions, when the ~~ultimate~~ basic design wind speed, V_{ult}, is estimated from regional climatic data, the ~~ultimate~~ basic design wind speed, V_{ult}, shall be determined in accordance with ~~Section 26.5.3~~ Chapter 26 of ASCE 7.

Delete and substitute as follows:

FIGURE ~~1609.3~~ 1609.3(1) (1)
~~ULTIMATE~~ BASIC DESIGN WIND SPEEDS, ~~v_{ult}~~V , FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

(Existing code figure not shown for clarity)

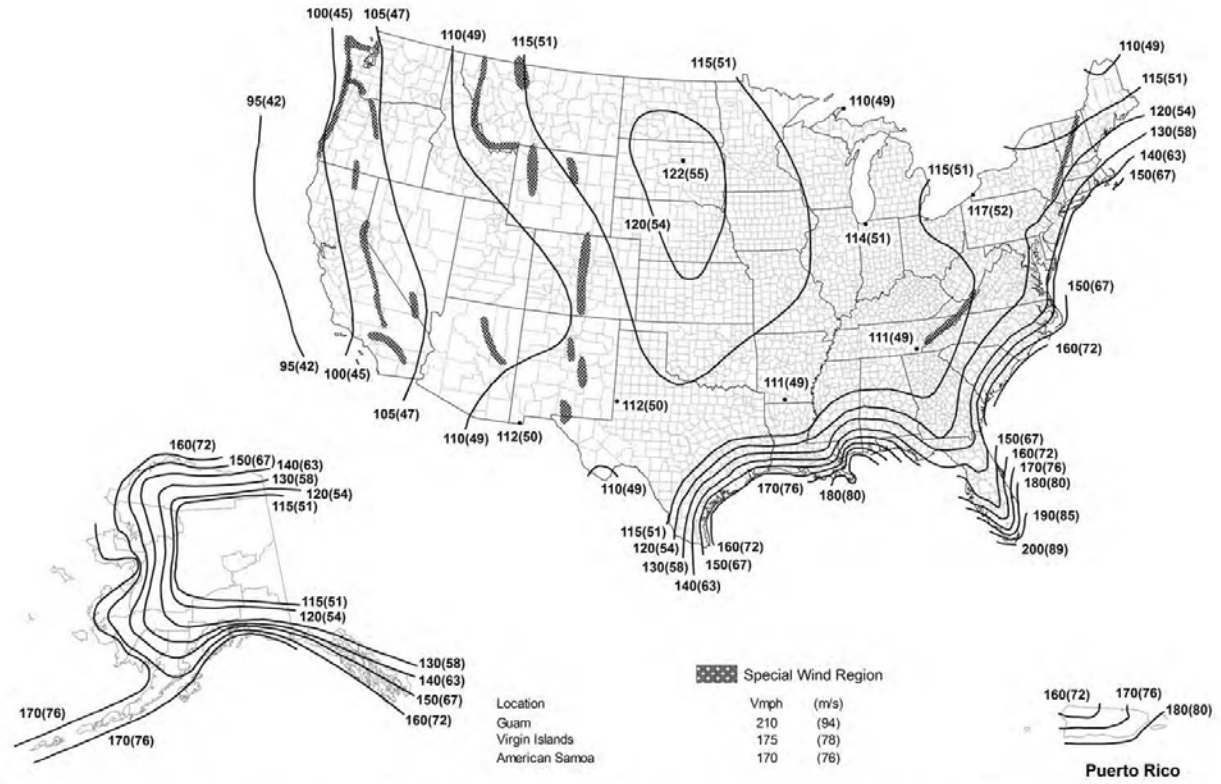


Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation is permitted between contours. Point values are provided to aid with interpolation.
3. Islands, coastal areas, and land boundaries outside the last contour shall use the last wind speed contour.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 Years).
6. Location-specific basic wind speeds shall be permitted to be determined using www.atcouncil.org/windspeed

Revise as follows:

FIGURE ~~1609.3~~ 1609.3(2) (2)
~~ULTIMATE~~ BASIC DESIGN WIND SPEEDS, $v_{~~ult~~}$, FOR RISK CATEGORY III ~~AND IV~~ BUILDINGS AND OTHER STRUCTURES

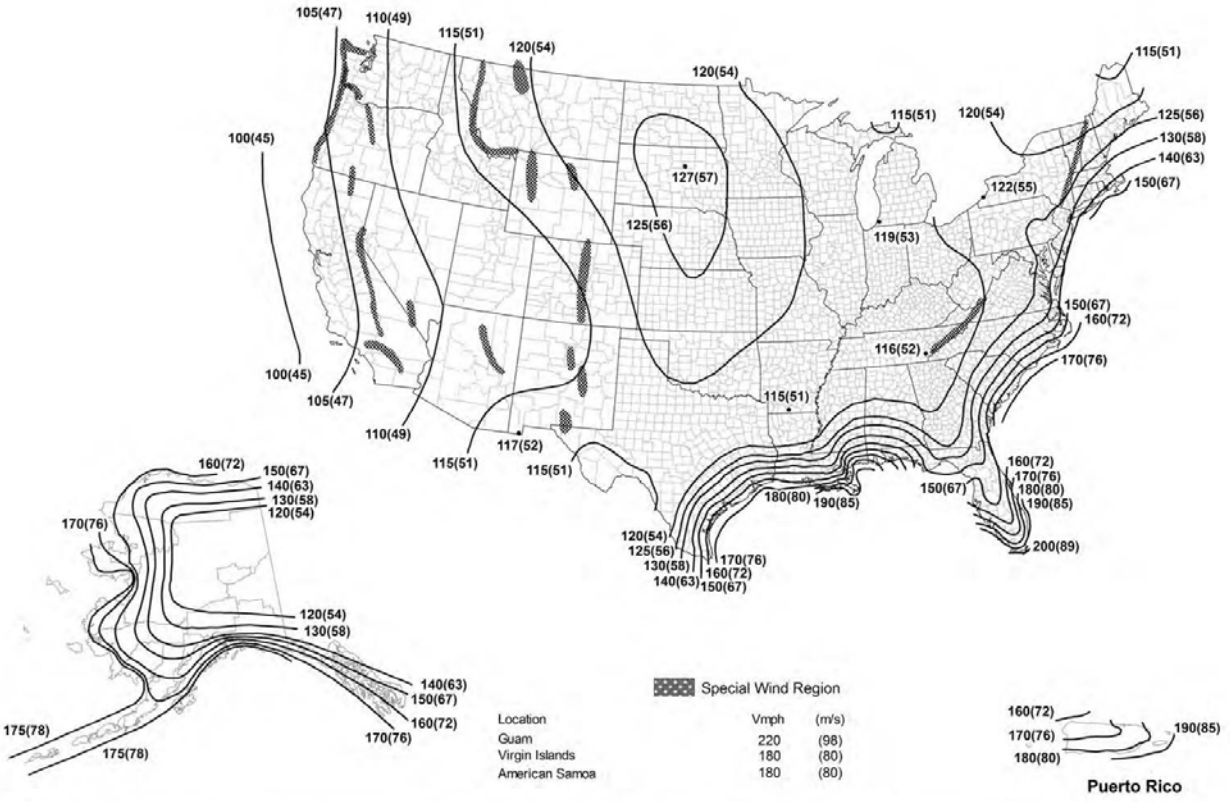
(Existing code figure not shown for clarity)



Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation is permitted between contours. Point values are provided to aid with interpolation.
3. Islands, coastal areas, and land boundaries outside the last contour shall use the last wind speed contour.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (Annual Exceedance Probability = 0.000588, MRI = 1700 Years).
6. Location-specific basic wind speeds shall be permitted to be determined using www.atcouncil.org/windspeed

Add new text as follows:

FIGURE 1609.3(3)
BASIC DESIGN WIND SPEEDS, V, FOR RISK CATEGORY IV BUILDINGS AND OTHER STRUCTURES



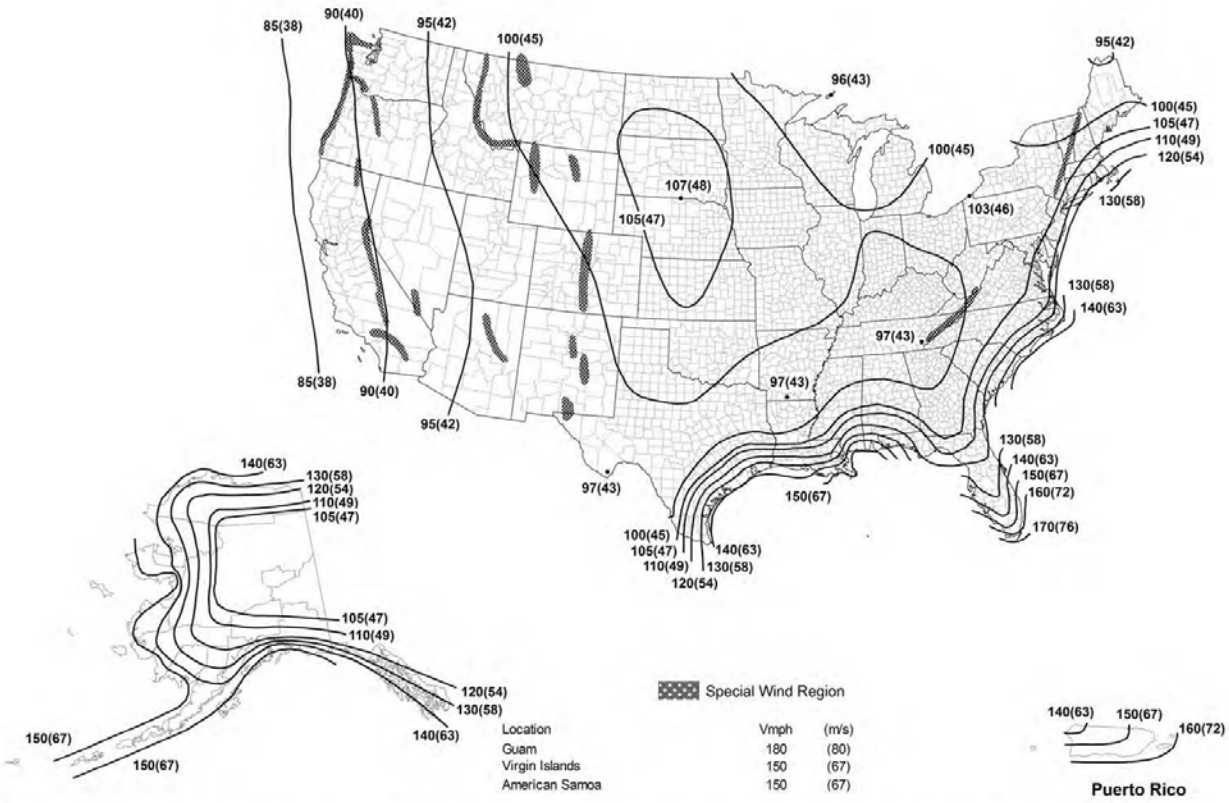
Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation is permitted between contours. Point values are provided to aid with interpolation.
3. Islands, coastal areas, and land boundaries outside the last contour shall use the last wind speed contour.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 1.6% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00033, MRI = 3000 Years).
6. Location-specific basic wind speeds shall be permitted to be determined using www.atcouncil.org/windspeed

Delete and substitute as follows:

FIGURE ~~1609.3~~1609.3(4) (3)
~~ULTIMATE~~BASIC DESIGN WIND SPEEDS, ~~v_{ult}~~V , FOR RISK CATEGORY I BUILDINGS AND OTHER STRUCTURES

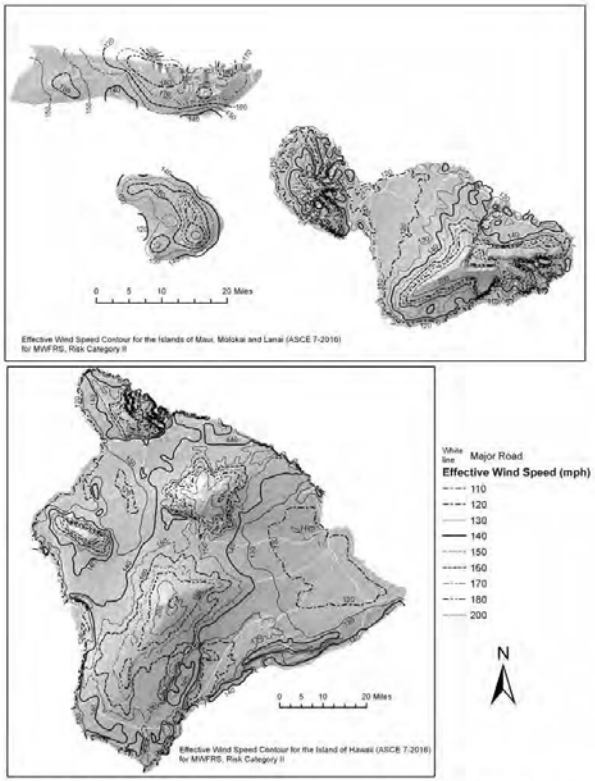
(Existing code figure not shown for clarity)



Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation is permitted between contours. Point values are provided to aid with interpolation.
3. Islands, coastal areas, and land boundaries outside the last contour shall use the last wind speed contour.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 15% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00333, MRI = 300 Years).
6. Location-specific basic wind speeds shall be permitted to be determined using www.atcouncil.org/windspeed

Add new text as follows:

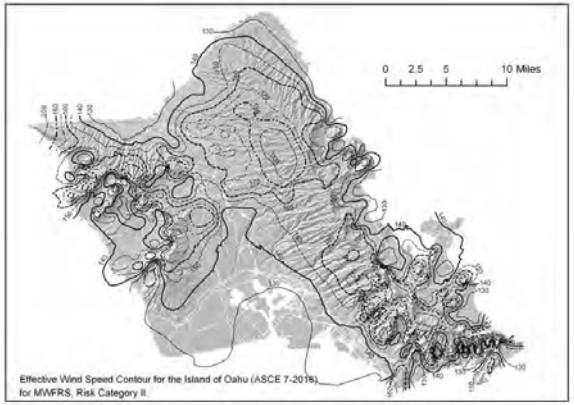
FIGURE 1609.3(5)
BASIC DESIGN WIND SPEEDS, V, FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES IN HAWAII



Basic Wind Speeds for Risk Category II Buildings and Other Structures (Hawaii).

Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_d of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 Years).

FIGURE 1609.3(5)
CONTINUED

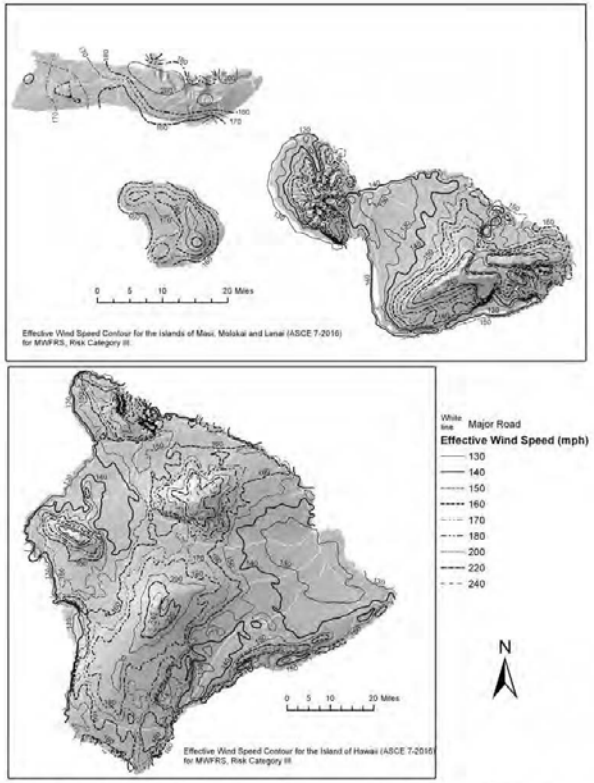


(continued) Basic Wind Speeds for Risk Category II Buildings and Other Structures (Hawaii).

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_{zt} of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 Years).

FIGURE 1609.3(6)
BASIC DESIGN WIND SPEEDS, V, FOR RISK CATEGORY III BUILDINGS AND OTHER STRUCTURES IN HAWAII

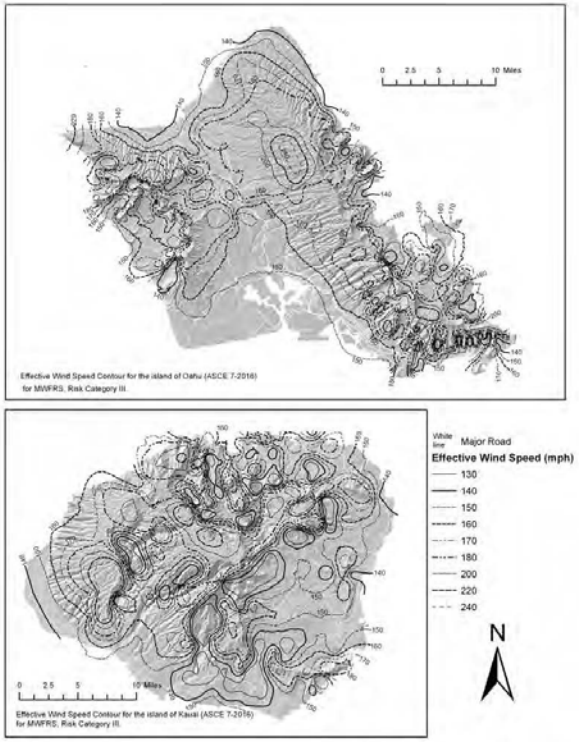


Basic Wind Speeds for Risk Category III Buildings and Other Structures (Hawaii).

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_{zt} of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (Annual Exceedance Probability = 0.000588, MRI = 1700 Years).).

FIGURE 1609.3(6)
CONTINUED

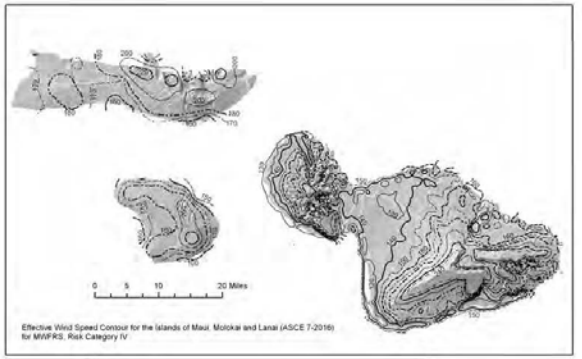


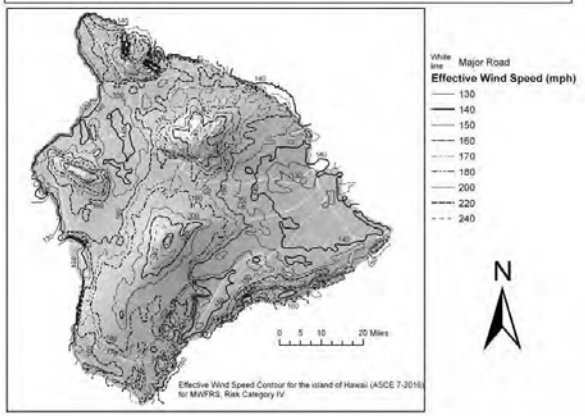
(continued) Basic Wind Speeds for Risk Category III Buildings and Other Structures (Hawaii).

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_{zt} of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (Annual Exceedance Probability = 0.000588, MRI = 1700 Years).).

FIGURE 1609.3(7)
BASIC DESIGN WIND SPEEDS, V, FOR RISK CATEGORY IV BUILDINGS AND OTHER STRUCTURES IN HAWAII



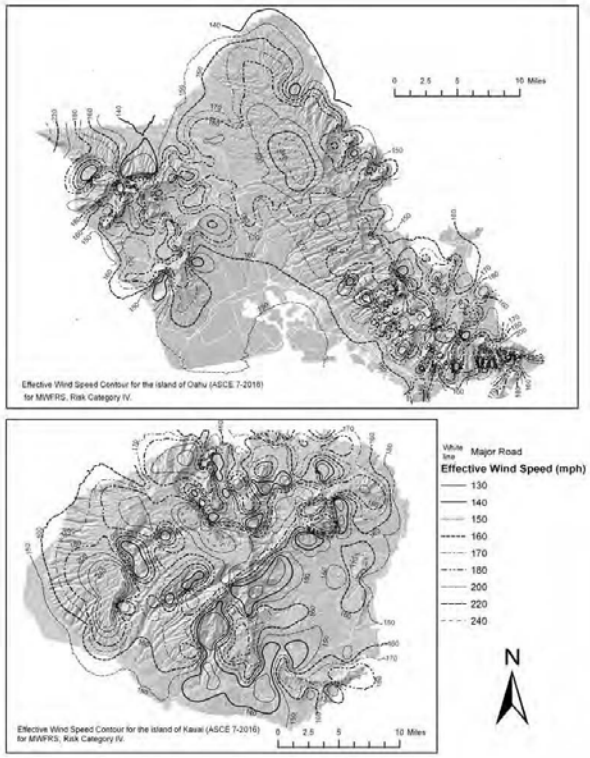


Basic Wind Speeds for Risk Category IV Buildings and Other Structures (Hawaii).

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_{zt} of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 1.7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.000333, MRI = 3000 Years).).

FIGURE 1609.3(7)
CONTINUED

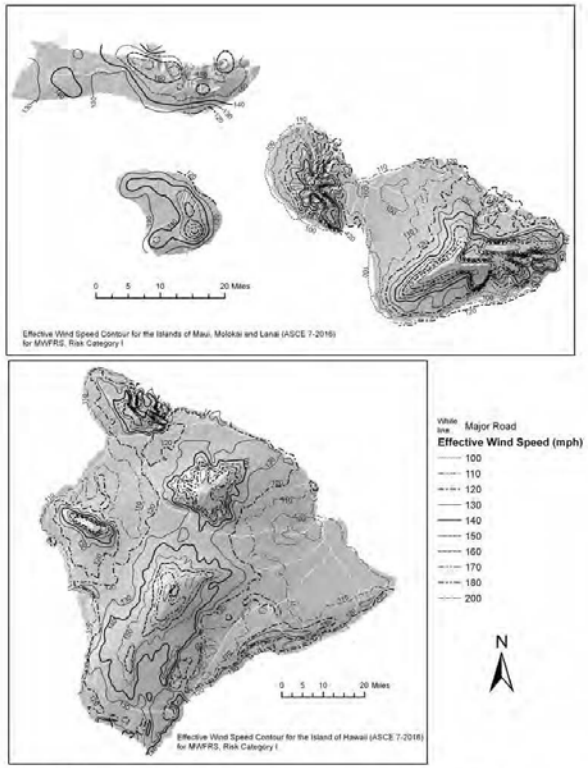


(continued) Basic Wind Speeds for Risk Category IV Buildings and Other Structures (Hawaii).

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_{zt} of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 1.7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.000333, MRI = 3000 Years).).

FIGURE 1609.3(8)
BASIC DESIGN WIND SPEEDS, V, FOR RISK CATEGORY I BUILDINGS AND OTHER STRUCTURES IN HAWAII

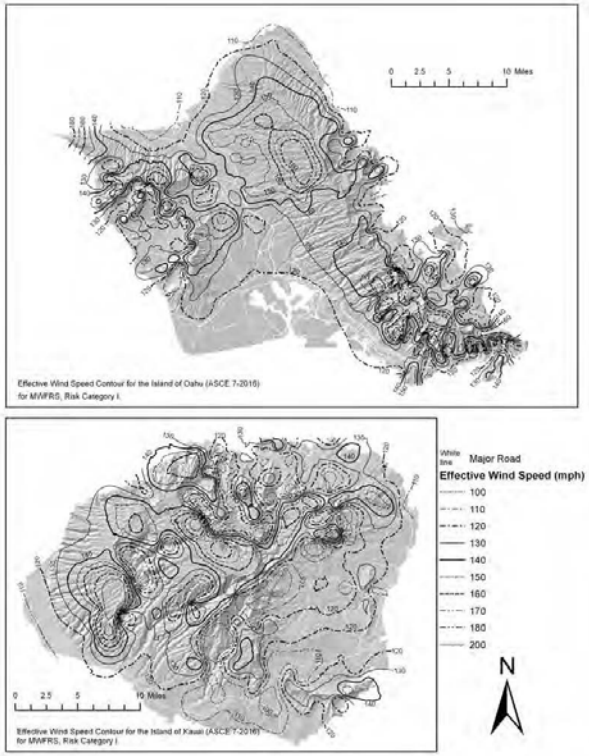


Basic Wind Speeds for Risk Category I Buildings and Other Structures (Hawaii).

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_{zt} of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 15% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00333, MRI = 300 Years).

FIGURE 1609.3(8)
CONTINUED



(continued) Basic Wind Speeds for Risk Category I Buildings and Other Structures (Hawaii).

Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. It is permitted to use the standard values of K_{zt} of 1.0 and K_d as given in Table 26.6-1
5. Ocean promontories and local escarpments shall be examined for unusual wind conditions.
6. Wind speeds correspond to approximately a 15% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00333, MRI = 300 Years).

Revise as follows:

1609.3.1 Wind speed conversion. When required, the ~~ultimate~~ basic design wind speeds of Figures 1609.3(1)~~, 1609.3(2) and 1609.3(3~~ through (8) shall be converted to ~~nominal~~ allowable stress design wind speeds, V_{asd}, using Table 1609.3.1 or Equation 16-33.

$$L = L_o\left(0.25 + \frac{15}{\sqrt{K_{LL}A_T}}\right) \qquad \textbf{(Equation 16-33)}$$

where:

V_{asd}	=	~~Nominal~~ Allowable stress design wind speed applicable to methods specified in Exceptions 4 and 5 of Section 1609.1.1.
V~~ult~~	=	~~Ultimate~~ Basic design wind speeds determined from Figures 1609.3(1)~~, 1609.3(2) or 1609.3(3~~ through (8).

TABLE 1609.3.1
WIND SPEED CONVERSIONS[a, b, c]

V_{ULT}	100	110	120	130	140	150	1
V_{asd}	78	85	93	101	108	116	1

For SI: 1 mile per hour = 0.44 m/s.

a. Linear interpolation is permitted.

b. V_{asd} = ~~nominal~~ allowable stress design wind speed applicable to methods specified in Exceptions 1 through 5 of Section 1609.1.1.

c. V~~ult~~ = ~~ultimate~~ basic design wind speeds determined from Figure 1609.3(1)~~, 1609.3(2) or 1609.3(3~~ through (8).

Reason: This proposal is a coordination proposal to bring the 2018 IBC up to date with the provision of the 2016 edition of *ASCE 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures* (ASCE 7-16).

The changes proposed in all sections harmonizes terminology between the code and the loading standard. In all instances the word "ultimate" is changed to "basic" and the subscript "ult" is removed from the variable "V". Similarly, the word "nominal" is changed to "allowable stress" in all placed to be consistent with the terminology used in the loading standard.

The increase in distance in 1609.1.1.1 Applicability to 2 miles from 1 mile is also to correct the discrepancy between the code and ASCE 7.

The design wind speed maps have been updated to reflect the maps adopted into ASCE 7-16. During the development of the ASCE 7-16 standard the ASCE 7 Wind Load Subcommittee made substantial revision to the wind speed maps contained within the standard, and the number of maps went from three to eight. These revisions include the development of separate maps for Risk Categories III and IV structures; reconstruction of the special wind regions within the maps, correcting known deficiencies in the wind speed contours; and modification of the basic wind speed based on updated climatic and weather data. New hurricane contours in the northeastern states were developed based on updated hurricane models and the locations of the contours along the hurricane coast line were adjusted to reflect new research into the decay rate of hurricanes over land. New maps for the State of Hawaii were developed to eliminate it as a "special wind region" and to provide guidance on the wind patterns for the state that occur because of the unique topography there. Currently there are eight new maps for main wind force and component and cladding design in the ASCE 7-16 standard along with four new serviceability maps.

Cost Impact: Will not increase the cost of construction

The proposed map changes will decrease the cost of construction in the majority of the United States. The basic design wind speeds have been lowered at most locations on the new maps based on the latest data available, thus reducing the overall cost of construction. Along the hurricane coastline from Virginia to Texas, the wind speeds remain nearly unchanged from the current maps and thus the cost of construction will not change. There may be a very small increase in Category IV structures in some parts of the country, due to the new mean recurrence interval for Risk Category IV, which has now been separated from Risk Category III.

The basic wind speeds for all four Risk Category maps decrease very significantly west of the Continental Divide. For example, in much of coastal California wind speeds decrease by as much as 16%, 15%, and 11% from the previous maps for Risk Category II, III, and IV structures, respectively. Wind speeds in the Northern Great Plains states are similar to previous maps, and wind

speeds in hurricane prone regions from Virginia to Texas remain nearly unchanged. In the rest of the continental United States south and east of the Great Plains, wind speeds decrease as much as 12%, 8%, and 4% for Risk Category II, III, and IV buildings respectively. For a comparatively small number of buildings, the design wind speeds for Risk Category IV increase slightly as a result of the split of Risk Category III and IV into separate maps with different mean recurrence intervals. The wind speeds for Risk Category IV buildings increase on the order of 5% in hurricane-prone regions from Virginia to Texas. The wind speeds for Risk Category IV buildings increase about 2% in much of Nebraska and the Dakotas and to a lesser extent in the adjacent states. This proposal coordinates the IBC with the referenced loading standard *ASCE 7 Minimum Design Loads and Associated Criteria for Buildings and Other Structures*. ASCE 7 will be updated from the 2010 edition to the 2016 edition as an Administrative Update to the 2018 I-Codes.

As of the submission date of this code change proposal, the ASCE 7 Standards Committee has completed the committee balloting on the technical changes. The document designated *ASCE 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures* is expected to be completed, published, and available for purchase prior to the ICC Public Comment Hearings for Group B in October of 2016. Any person interested in obtaining a public comment copy of ASCE 7-16 may do so by contacting James Neckel at ASCE (jneckel "at" asce.org).

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

[BS] WIND-BORNE DEBRIS REGION. *Areas within hurricane-prone regions located:*

1. Within 1 mile (1.61 km) of the coastal mean high water line where the ~~ultimate~~ basic design wind speed, V ~~ult~~, is 130 mph (58 m/s) or greater; or
2. In areas where the ~~ultimate~~ basic design wind speed is 140 mph (63.6 m/s) or greater.

For Risk Category II buildings and structures and Risk Category III buildings and structures, except health care facilities, the wind-borne debris region shall be based on Figure 1609.3.(1). For Risk Category IV buildings and structures and Risk Category III health care facilities, the windborne debris region shall be based on Figure 1609.3(2).

[BS] WIND SPEED, Vult. ~~Ultimate~~ Basic design wind speeds.

[BS] WIND SPEED, V_{asd}. ~~Nominal~~ Allowable stress design wind speeds.

SECTION 2308
CONVENTIONAL LIGHT-FRAME CONSTRUCTION

2308.2.4 ~~Ultimate~~ *Basic* *wind speed.* ~~*Vult*~~ *shall not exceed 130 miles per hour (57 m/s) (3-second gust).*

Exceptions:

1. ~~*Vult*~~ shall not exceed 140 mph (61.6 m/s) (3-second gust) for buildings in Exposure Category B that are not located in a *hurricane-prone region*.
2. Where ~~*Vult*~~ exceeds 130 mph (3-second gust), the provisions of either AWC WFCM or ICC 600 are permitted to be used.

CHAPTER 24
GLASS AND GLAZING

SECTION 2404
WIND, SNOW, SEISMIC AND DEAD LOADS ON GLASS

2404.1 Vertical glass. Glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors and other exterior applications shall be designed to resist the wind loads due to ~~ultimate~~ *basic design wind speed, ~~Vult~~,* in *S*ection 1609 for components and cladding. Glass in glazed curtain walls, glazed storefronts and glazed partitions shall meet the seismic requirements of ASCE 7, Section 13.5.9. The load resistance of glass under uniform load shall be determined in accordance with ASTM E 1300.

The design of vertical glazing shall be based on Equation 24-1.

$0.6\ F_{gw} \leq F_{ga}$	**(Equation 24-1)**

where:

F_{gw}	=	Wind load on the glass due to ~~ultimate~~ basic design wind speed, V_{ult} , computed in accordance with Section 1609.
F_{ga}	=	Short duration load on the glass as determined in accordance with ASTM E 1300.

2404.2 Sloped glass. Glass sloped more than 15 degrees (0.26 rad) from vertical in skylights, sunrooms, sloped roofs and other exterior applications shall be designed to resist the most critical combinations of loads determined by Equations 24-2, 24-3 and 24-4.

$F_g = 0.6\ W_o - D$	**(Equation 24-2)**
$F_g = 0.6\ W_i + D + 0.5\ S$	**(Equation 24-3)**
$F_g = 0.3\ W_i + D + S$	**(Equation 24-4)**

where:

D	=	Glass dead load psf (kN/m ^{2}).
		For glass sloped 30 degrees (0.52 rad) or less from horizontal,
	=	13 t_g (For SI: 0.0245 t_g).
		For glass sloped more than 30 degrees (0.52 rad) from horizontal,
	=	13 t_g cos (For SI: 0.0245 t_g cos).
F_g	=	Total load, psf (kN/m ^{2}) on glass.
S	=	Snow load, psf (kN/m ^{2}) as determined in Section 1608.
t_g	=	Total glass thickness, inches (mm) of glass panes and plies.
W_i	=	Inward wind force, psf (kN/m ^{2}) due to ~~ultimate~~basic design wind speed, V_{ult} , as calculated in Section 1609.
W_o	=	Outward wind force, psf (kN/m ^{2}) due to ~~ultimate~~basic design wind speed, V_{ult} , as calculated in Section 1609.
	=	Angle of slope from horizontal.-
=	Angle of slope from horizontal.	

Exception: The performance grade rating of unit skylights and tubular daylighting devices shall be determined in accordance with Section 2405.5.

The design of sloped glazing shall be based on Equation 24-5.

$F_g \leq F_{ga}$	**(Equation 24-5)**

where:

F_g	=	Total load on the glass as determined by Equations 24-2, 24-3 and 24-4.
F_{ga}	=	Short duration load resistance of the glass as determined in accordance with ASTM E 1300 for Equations 24-2 and 24-3; or the long duration load resistance of the glass as determined in accordance with ASTM E 1300 for Equation 24-4.

2404.3 Wired, patterned and sandblasted glass.

2404.3.1 Vertical wired glass. Wired glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors and other exterior applications shall be designed to resist the wind loads in Section 1609 for components and cladding according to the following equation:

$0.6 F_{gw} < 0.5 F_{ge}$	**(Equation 24-6)**

where:

F_{gw}	=	Wind load on the glass due to ~~ultimate~~ basic design wind speed, V_{ult} , computed in accordance with Section 1609.
F_{ge}	=	Nonfactored load from ASTM E 1300 using a thickness designation for monolithic glass that is not greater than the thickness of wired glass.

2404.3.3 Vertical patterned glass. Patterned glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors and other exterior applications shall be designed to resist the wind loads in Section 1609 for components and cladding according to Equation 24-9.

$F_{gw} < 1.0 F_{ge}$	**(Equation 24-9)**

where:

F_{gw}	=	Wind load on the glass due to ~~ultimate~~ basic design wind speed, V_{ult} , computed in accordance with Section 1609.
F_{ge}	=	Nonfactored load in accordance with ASTM E 1300. The value for patterned glass shall be based on the thinnest part of the glass. Interpolation between nonfactored load charts in ASTM E 1300 shall be permitted.

2404.3.5 Vertical sandblasted glass. Sandblasted glass sloped 15 degrees (0.26 rad) or less from vertical in windows, curtain and window walls, doors, and other exterior applications shall be designed to resist the wind loads in Section 1609 for components and cladding according to Equation 24-12.

$0.6 F_{gw} < 0.5 F_{ge}$	**(Equation 24-12)**

where:

F_g	=	Wind load on the glass due to ~~ultimate~~ basic design wind speed, V_{ult} , computed in accordance with Section 1609.
F_{ge}	=	Nonfactored load in accordance with ASTM E 1300. The value for sandblasted glass is for moderate levels of sandblasting.

SECTION 2405
SLOPED GLAZING AND SKYLIGHTS

2405.5.2 Skylights rated for separate performance grades for positive and negative design pressure. The design of skylights rated for performance grade for both positive and negative design pressures shall be based on Equations 24-14 and 24-15.

$F_{gi} \le PG_{Po}$	**(Equation 24-14)**
$F_{go} \le PG_{Ne}$	**(Equation 24-15)**

where:

PG_{Pos}	=	Performance grade rating of the skylight under positive design pressure;
PG_{Neg}	=	Performance grade rating of the skylight under negative design pressure; and

F_{gi} and F_{go} are determined in accordance with the following:
For $0.6W_o \ge D$,

where:

W_o	=	Outward wind force, psf (kN/m^2) due to ~~ultimate~~ basic design wind speed, V_{ult} , as calculated in Section 1609.
D	=	The dead weight of the glazing, psf (kN/m^2) as determined in Section 2404.2 for glass, or by the weight of the plastic, psf (kN/m^2) for plastic glazing.
F_{gi}	=	Maximum load on the skylight determined from Equations 24-3 and 24-4 in Section 2404.2.
F_{go}	=	Maximum load on the skylight determined from Equation 24-2.

For $0.6 W_o < D$,

where:

W_o	=	The outward wind force, psf (kN/m^2) due to ~~ultimate~~ basic design wind speed, V_{ult} . as calculated in Section 1609.
D	=	The dead weight of the glazing, psf (kN/m^2) as determined in Section 2404.2 for glass, or by the weight of the plastic for plastic glazing.
F_{gi}	=	Maximum load on the skylight determined from Equations 24-2 through 24-4 in Section 2404.2.
F_{go}	=	0.

Committee Reason: This proposal updates the IBC wind load provisions for coordination with the latest edition of the referenced standard, ASCE 7 which was updated in ADM94-16. These terminology updates are very important to capture in the IBC. The modification picks up additional coordination with IBC wind requirements that were not in the original proposal.

Assembly Action **None**

Final Action Results

S56-16 **AM**

Back

Code Change No: G180-15

Original Proposal

Section: 406.7.2, TABLE 601, 603.1, 705.2.3, 803.3, 803.13.3, 1406.3, [BG] 1510.2.5, [BG] 1510.3, 3105.3, D102.2.8, 803.1

Proponent: Dennis Richardson, American Wood Council, representing American Wood Council (drichardson@awc.org)

Revise as follows:

406.7.2 Canopies. Canopies under which fuels are dispensed shall have a clear, unobstructed height of not less than 13 feet 6 inches (4115 mm) to the lowest projecting element in the vehicle drive-through area. Canopies and their supports over pumps shall be of noncombustible materials, *fire-retardant-treated wood* complying with Chapter 23, ~~wood of Type IV sizes~~ heavy timber complying with Section 2304.11 or of construction providing 1-hour *fire resistance*. Combustible materials used in or on a *canopy* shall comply with one of the following:

1. Shielded from the pumps by a noncombustible element of the *canopy*, or ~~wood of Type IV sizes~~ heavy timber complying with Section 2304.11;
2. Plastics covered by aluminum facing having a thickness of not less than 0.010 inch (0.30 mm) or corrosion-resistant steel having a base metal thickness of not less than 0.016 inch (0.41 mm). The plastic shall have a *flame spread index* of 25 or less and a smoke developed index of 450 or less when tested in the form intended for use in accordance with ASTM E 84 or UL 723 and a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929; or
3. Panels constructed of light-transmitting plastic materials shall be permitted to be installed in *canopies* erected over motor vehicle fuel-dispensing station fuel dispensers, provided the panels are located not less than 10 feet (3048 mm) from any building on the same *lot* and face *yards* or streets not less than 40 feet (12 192 mm) in width on the other sides. The aggregate areas of plastics shall be not greater than 1,000 square feet (93 m^2). The maximum area of any individual panel shall be not greater than 100 square feet (9.3 m^2).

TABLE 601 (601)
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame[f] (see Section 202)	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls Exterior[e, f] Interior	3 3[a]	2 2[a]	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	See Section ~~602.4.6~~2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	$1\frac{1}{2}$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.
d. Not less than the fire-resistance rating required by other sections of this code.
e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
f. Not less than the fire-resistance rating as referenced in Section 704.10.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

   1.1 Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less.
   1.2 Nonbearing *exterior walls* where fire-resistance-rated construction is not required.
   1.3 Roof construction, including girders, trusses, framing and decking.

   Exception: In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

   Exceptions:

   1 Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
   2 Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.

3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Sections 801 and 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated wood*, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.
13. Combustible *exterior wallcoverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.

17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.11.
19. Heavy timber as permitted by Note c to Table 601 and Sections ~~602.4.7~~602.4.3 and 1406.3.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the *International Mechanical Code*.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

705.2.3 Combustible projections. Combustible projections extending to within 5 feet (1524 mm) of the line used to determine the *fire separation distance* shall be of not less than 1-hour fire-resistance-rated construction, ~~Type IV~~ heavy timber construction complying with Section 2304.11, fire-retardant-treated wood or as required by Section 1406.3.

Exception: Type VB construction shall be allowed for combustible projections in Group R-3 and U occupancies with a fire separation distance greater than or equal to 5 feet (1524 mm).

803.3 Heavy timber exemption. Exposed portions of building elements complying with the requirements for buildings of ~~Type IV~~ heavy timber construction in Section 602.4 or Section 2304.11 shall not be subject to *interior finish* requirements.

803.13.3 Heavy timber construction. Wall and ceiling finishes of all classes as permitted in this chapter that are installed directly against the wood decking or planking of ~~Type IV~~ heavy timber construction in Sections 602.4.2 or 2304.11 or to wood furring strips applied directly to the wood decking or planking shall be fireblocked as specified in Section 803.13.1.1.

1406.3 Balconies and similar projections. Balconies and similar projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated where required by Table 601 for floor construction or shall be of ~~Type IV~~ heavy timber construction in accordance with Section ~~602.4~~ 2304.11. The aggregate length of the projections shall not exceed 50 percent of the building's perimeter on each floor.

Exceptions:

1. On buildings of Type I and II construction, three stories or less above *grade plane*, *fire-retardant-treated wood* shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.
2. Untreated wood is permitted for pickets and rails or similar guardrail devices that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections on buildings of Type III, IV and V construction shall be permitted to be of Type V construction, and shall not be required to have a *fire-resistance rating* where sprinkler protection is extended to these areas.
4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.

[BG] 1510.2.5 Type of construction. Penthouses shall be constructed with walls, floors and roofs as required for the type of construction of the building on which such penthouses are built.

Exceptions:

1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall not be required to have a fire-resistance rating.
2. On buildings of Type I construction two stories or less in height above grade plane or of Type II construction, the exterior walls and roofs of penthouses with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602 and be constructed of fire-retardant-treated wood. The exterior walls and roofs of penthouses with a *fire separation distance* of 20 feet (6096 mm) or greater shall be permitted to be constructed of fire-retardant-treated wood and shall not be required to have a fire-resistance rating. Interior framing and walls shall be permitted to be constructed of fire-retardant-treated wood.
3. On buildings of Type III, IV or V construction, the exterior walls of penthouses with a fire separation distance greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table 602. On buildings of Type III, IV or VA construction, the exterior walls of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be of ~~Type IV~~ heavy timber construction complying with Sections 602.4 and 2304.11 or noncombustible construction or fire-retardant-treated wood and shall not be required to have a fire-resistance rating.

[BG] 1510.3 Tanks. Tanks having a capacity of more than 500 gallons (1893 L) located on the roof deck of a building shall be supported on masonry, reinforced concrete, steel or ~~Type IV~~ heavy timber construction complying with Section 2304.11 provided that, where such supports are located in the building above the lowest *story*, the support shall be fire-resistance rated as required for Type IA construction.

3105.3 Design and construction. *Awnings* and *canopies* shall be designed and constructed to withstand wind or other lateral loads and live loads as required by Chapter 16 with due allowance for shape, open construction and similar features that relieve the pressures or loads. Structural members shall be protected to prevent deterioration. *Awnings* shall have frames of noncombustible material, *fire-retardant-treated wood*, ~~wood of Type IV size~~ heavy timber complying with Section 2304.11, or 1-hour construction with combustible or noncombustible covers and shall be either fixed, retractable, folding or collapsible
.

D102.2.8 Permanent canopies. Permanent canopies are permitted to extend over adjacent open spaces provided all of the following are met:

1. The canopy and its supports shall be of noncombustible material, *fire-retardant-treated wood*, ~~Type IV construction~~ heavy timber complying with Section 2304.11 or of 1-hour fire-resistance-rated construction.

   Exception: Any textile covering for the canopy shall be flame resistant as determined by tests conducted in accordance with NFPA 701 after both accelerated water leaching and accelerated weathering.

2. Any canopy covering, other than textiles, shall have a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723 in the form intended for use.
3. The canopy shall have at least one long side open.
4. The maximum horizontal width of the canopy shall not exceed 15 feet (4572 mm).

5. The *fire resistance* of *exterior walls* shall not be reduced.

2015 International Fire Code

Revise as follows:

803.1 General. The provisions of this section shall limit the allowable fire performance and smoke development of interior wall and ceiling finishes and interior wall and ceiling trim in existing buildings based on location and occupancy classification. Interior wall and ceiling finishes shall be classified in accordance with Section 803 of the *International Building Code*. Such materials shall be grouped in accordance with ASTM E 84, as indicated in Section 803.1.1, or in accordance with NFPA 286, as indicated in Section 803.1.2.

Exceptions:

1. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls and ceilings.
2. Exposed portions of structural members complying with the requirements of ~~buildings of Type IV construction~~ heavy timber in accordance with the *International Building Code* shall not be subject to interior finish requirements.

Reason: This code change is part 2 of a proposal to reorganize Type IV Section 602.4 and heavy timber section 2304.11. This part of the change includes references found throughout the IBC to either: Type IV construction, Section 602.4, Section 2304.11, or "heavy timber". This change should follow directly after the 602.4 change and the reason for the change is included in that reason statement.

The references found in this part are generally changed to Type IV or Section 602.4 when the section of the code is referring to the type of construction associated with a structure. The references are generally changed to "heavy timber complying with Section 2304.11" when the code is referring to a heavy timber element found in a building of another type of construction. This change is a reorganization of two sections and is not intended to change the intent of the code.

Cost Impact: Will not increase the cost of construction
Since this is a reorganization of existing requirements, not the creation of new requirements, this code change will not increase the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This is a companion piece to G179-15. G179 reorganizes the heavy timber provisions. This change provides corrections to the various new section numbers resulting from G179-15.

Assembly Action **None**

Final Hearing Results

G180-15 **AS**

Back

Code Change No: S3-15

Original Proposal

Section: [BF] 1508.1.1, Table [BF] 1508.2

Proponent: Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

THIS PROPOSAL WAS HEARD BY THE FIRE SAFETY COMMITTEE.

Delete without substitution:

[BF] 1508.1.~~1 Cellulosic fiberboard.~~ ~~Cellulosic fiberboard roof insulation shall conform to the material and installation requirements of Chapter 23.~~

Revise as follows:

TABLE [BF] 1508.2
MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene	ASTM C 578
Fiber-reinforced gypsum board	ASTM C 1278
Glass-faced gypsum board	ASTM C 1177
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or II
Wood fiberboard	ASTM C 208, Type II

Reason: The purpose of this code change is to clarify the intent of the code and to remove redundancy. As written, Section 1508.1.1 is a pointer to Chapter 23. Information in Chapter 23 related to wood fiberboard roof insulation is redundant to information already in Chapter 15 so the pointer does not serve a useful purpose.

Further, the title of section 1508.1.1 is potentially confusing because the term "cellulosic fiberboard" is used while the term "wood fiberboard" is used in Table 1508.2. This change eliminates the lesser used of the two terms to describe the same material. Lastly, "Type II" is added to the ASTM C208 reference for wood fiberboard in Table 1508.2. Of the six types of wood fiberboard addressed in ASTM C208, only Type II is used for roof insulation.

Cost Impact: Will not increase the cost of construction
The proposed change is a clarification and does not change the stringency of existing code requirements so the cost of construction will be unchanged.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that Section 1508, which referenced Chapter 23, was not required as the information in chapter 23 is also in Chapter 15. Further, the committee agreed that wood fiberboard was the current industry term for cellulosic fiberboard complying with ASTM C 208, Type II.

Assembly Action **None**

Final Hearing Results

S3-15 **AS**

Back

Code Change No: S4-15

Original Proposal

Section: Table [BF] 1508.2

Proponent: Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

THIS PROPOSAL WAS HEARD BY THE FIRE SAFETY COMMITTEE.

Revise as follows:

TABLE [BF] 1508.2
MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or ~~VI~~ VII
Expanded polystyrene	ASTM C 578
Extruded polystyrene	ASTM C 578
Fiber-reinforced gypsum board	ASTM C 1278
Glass-faced gypsum board	ASTM C 1177
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or II
Wood fiberboard	ASTM C 208

Reason: The purpose of this change is to update the type designations listed for the ASTM standard currently referenced in the code for composite board roof insulation. ASTM C1289-13E1 is referenced. As part of the 13E1 edition, Type VI was removed and Type VII was added. The proposed change strikes the outdated "Type VI" and adds the new "Type VII".

Cost Impact: Will not increase the cost of construction
The proposed change is a clarification and does not change the stringency of existing code requirements so the cost of construction will be unchanged.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that keeping the codes current with updated referenced standards was important.

Assembly Action **None**

Final Hearing Results

S4-15 **AS**

Back

Code Change No: S6-15

Original Proposal

Section: Table [BF] 1508.2

Proponent: Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

THIS PROPOSAL WAS HEARD BY THE FIRE SAFETY COMMITTEE.

Revise as follows:

TABLE [BF] 1508.2
MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene	ASTM C 578
Fiber-reinforced gypsum board	ASTM C 1278
Glass-faced gypsum board	ASTM C 1177
High-density polyisocyanurate board	ASTM C1289, Type II, Class 4
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or II
Wood fiberboard	ASTM C 208

Reason: The purpose of this change is to add a listing for high-density polyisocyanurate board roof insulation in Table 1508.2. As part of the 13E1 edition of ASTM C1289 (already included in IBC), Type II, Class 4 was added to the standard to address high-density polyisocyanurate board roof insulation.

Cost Impact: Will not increase the cost of construction
The proposed change is a clarification and does not change the stringency of existing code requirements so the cost of construction will be unchanged.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that keeping the codes current with updated referenced standards was important.

Assembly Action **None**

Final Hearing Results

S6-15 **AS**

Back

Code Change No: S7-15

Original Proposal

Section: 1510.1.1 (New), [BG] 1510.2.1, [BG] 1510.2.2, [BG] 1510.2.3

Proponent: Maureen Traxler, representing Washington Association of Building Officials Technical Code Development Committee (maureen.traxler@seattle.gov)

THIS PROPOSAL WAS HEARD BY THE IBC-GENERAL COMMITTEE.

Add new text as follows:

1510.1.1 Area limitation. The aggregate area of penthouses and other enclosed rooftop structures shall not exceed one-third the area of the supporting roof deck. Such penthouses and other enclosed rooftop structures shall not be required to be included in determining the building area or number of stories as regulated by Section 503.1. The area of such penthouses shall not be included in determining the fire area specified in Section 901.7.

Revise as follows:

[BG] 1510.2.1 Height above roof deck. Penthouses constructed on buildings of other than Type I construction shall not exceed 18 feet (5486 mm) in height above the roof deck as measured to the average height of the roof of the penthouse. Penthouses located on the roof of buildings of Type I construction shall not be limited in height.

~~**Exceptions:**~~

1. ~~Where used to enclose tanks or elevators that travel to the roof level, penthouses shall be permitted to have a maximum height of 28 feet (8534 mm) above the roof deck.~~
2. ~~Penthouses located on the roof of buildings of Type I construction shall not be limited in height.~~

Exception: Where used to enclose tanks or elevators that travel to the roof level, penthouses shall be permitted to have a maximum height of 28 feet (8534 mm) above the roof deck.

Delete without substitution:

~~**[BG] 1510.2.2 Area limitation.** The aggregate area of penthouses and other enclosed rooftop structures shall not exceed one-third the area of the supporting roof deck. Such penthouses and other enclosed rooftop structures shall not be required to be included in determining the building area or number of stories as regulated by Section 503.1. The area of such penthouses shall not be included in determining the fire area specified in Section 901.7.~~

Revise as follows:

[BG] 1510.2.3 Use limitations. Penthouses shall not be used for purposes other than the shelter of mechanical or electrical equipment, tanks, elevators and related machinery, or vertical shaft openings in the roof assembly.

Reason: This proposal reorganizes the provisions for penthouses. Section 1510.2.2 is relocated to 1510.1 because it applies to all enclosed rooftop structures, and shouldn't be located in the subsection that applies only to penthouses. In Section 1510.2.1, exception 2 is relocated to the charging paragraph because it is actually a separate technical requirement and not an exception to

the charging paragraph. The phrase "elevators and related machinery" is added in Section 1510.2.3 because it is part of the definition of "penthouse." Penthouses are commonly used to shelter rooftop elevator equipment and shouldn't be prohibited by Section 1510.

Cost Impact: Will not increase the cost of construction
This proposal will not increase the cost of construction because it merely reorganizes and clarifies the existing code sections.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee approved this proposal because it clarifies and improves the code.

Assembly Action **None**

Final Hearing Results

S7-15	**AS**

Back

Code Change No: S9-15

Original Proposal

Section: 1510.7.3

Proponent: Maureen Traxler, City of Seattle, representing Seattle Dept of Planning & Development (maureen.traxler@seattle.gov)

THIS PROPOSAL WAS HEARD BY THE IBC-GENERAL COMMITTEE.

Delete without substitution:

~~**[BG] 1510.7.3 Installation.** Rooftop-mounted *photovoltaic panels* and *modules* shall be installed in accordance with the manufacturer's instructions.~~

Reason: Section 1510.7.3 is redundant with Section 1510.7.4.

Cost Impact: Will not increase the cost of construction
Deleting redundant text will have no impact on the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This is a good catch. It deletes repetitive, redundant material that serves no purpose in the code.

Assembly Action **None**

Final Hearing Results

S9-15	**AS**

Back

Code Change No: S27-16

Original Proposal

Section: 1507.1.1 (New), 1507.1.2 (New), 1507.2.3, 1507.3.3, 1507.4.5, 1507.5.3, 1507.5.4, 1507.6.3, 1507.6.4, 1507.7.3, 1507.7.4, 1507.8, 1507.9.3, 1507.9.4, 1507.17.3, 1507.17.4

Proponent: T. Eric Stafford, PE, representing Institute for Business and Home Safety

Add new text as follows:

1507.1.1 Underlayment. Underlayment for asphalt shingles, clay and concrete tile, metal roof shingles, mineral surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes and metal roof panels shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D 226, D 1970, D 4869 and D 6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table 1507.1.1(1). Underlayment shall be applied in accordance with Table 1507.1.1(2). Underlayment shall be attached in accordance with Table 1507.1.1(3).

Exceptions:

1. As an alternative, self-adhering polymer modified bitumen underlayment complying with ASTM D 1970 installed in accordance with the manufacturer's installation instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted.
2. As an alternative, a minimum 4-inch wide strip of self-adhering polymer modified bitumen membrane complying with ASTM D 1970 installed in accordance with the manufacturer's installation instructions for the deck material shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for design wind speeds less than 120 mph shall be applied over the 4-inch wide membrane strips.
3. As an alternative, two layers of underlayment complying with ASTM D 226 Type II or ASTM D 4869 Type IV shall be permitted to be installed as follows: Apply a 19-inch strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide strips of underlayment felt, overlapping successive sheets 19 inches. The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6- inch spacing at side and end laps. End laps shall be 4 inches and shall be offset by 6 feet (1829 mm). Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch. Thickness of the outside edge of plastic caps shall be not less than 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.

1507.1.2 Ice barriers. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier shall be installed for asphalt shingles, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, and wood shakes. The ice barrier shall consists of not less than two layers of underlayment cemented together or a self-adhering polymer modified bitumen sheet shall be used in place of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

TABLE 1507.1.1(1)
Underlayment Types

Roof Covering	Section	Maximum Ultimate Design Wind Speed, V_{ult} < 140 mph	Maximum Ultimate Design Wind Speed, Vult ≥ 140 mph
Asphalt Shingles	1507.2	ASTM D 226 Type I or II ASTM D 4869 Type I, II, III, or IV ASTM D 6757	ASTM D 226 Type II ASTM D 4869 Type IV ASTM D 6757
Clay and concrete tiles	1507.3	ASTM D 226 Type II ASTM D 2626 Type I ASTM D 6380 Class M mineral surfaced roll roofing	ASTM D 226 Type II ASTM D 2626 Type I ASTM D 6380 Class M mineral surfaced roll roofing
Metal panels	1507.4	Manufacturer's instructions	ASTM D 226 Type II ASTM D 4869 Type IV
Metal roof shingles	1507.5	ASTM D 226 Type I or II ASTM D 4869 Type I, II, III, or IV	ASTM D 226 Type II ASTM D 4869 Type IV
Mineral-surfaced roll roofing	1507.6	ASTM D 226 Type I or II ASTM D 4869 Type I, II, III, or IV	ASTM D 226 Type II ASTM D 4869 Type IV
Slate shingles	1507.7	ASTM D 226 Type II ASTM D 4869 Type III or IV	ASTM D 226 Type II ASTM D 4869 Type IV
Wood shingles	1507.8	ASTM D 226 Type I or II ASTM D 4869 Type I, II, III, or IV	ASTM D 226 Type II ASTM D 4869 Type IV
Wood shakes	1507.9	ASTM D 226 Type I or II ASTM D 4869 Type I, II, III, or IV	ASTM D 226 Type II ASTM D 4869 Type IV
Photovoltaic shingles	1507.17	ASTM D 226 Type I or II ASTM D 4869 Type I, II, III, or IV ASTM D 6757	ASTM D 226 Type II ASTM D 4869 Type IV ASTM D 6757

TABLE 1507.1.1(2)
Underlayment Application

Roof Covering	Section	Maximum Ultimate Design Wind Speed, Vult < 140 mph	Maximum Ultimate Design Wind Speed, Vult ≥ 140 mph
Asphalt shingles	1507.2	For roof slopes from two units vertical in 12 units horizontal (2:12), up to four units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner. Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm). End laps shall be 4 inches and shall be offset by 6 feet (1829 mm). Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of four units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet (1829 mm).	Same as Maximum Ultimate Design Wind Speed, V_{ult} < 140 mph except all laps shall be a minimum of 4 inches

Roof Covering	Section	Maximum Ultimate Design Wind Speed, Vult < 140 mph	Maximum Ultimate Design Wind Speed, Vult ≥ 140 mph
Clay and concrete tile	1507.3	For roof slopes from two and one-half units vertical in 12 units horizontal (2 1/2:12), up to four units vertical in 12 units horizontal (4:12), underlayment shall be a minimum of two layers underlayment applied as follows. Starting at the eave, apply a 19-inch (483 mm) strip of underlayment shall be applied parallel with the eave. Starting at the eave, apply a36-inch-wide (914 mm) strips of underlayment felt shall be applied, overlapping successive sheets 19 inches (483 mm). End laps shall be 4 inches and shall be offset by 6 feet (1829 mm). For roof slopes of four units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), End laps shall be 4 inches and shall be offset by 6 feet (1829 mm).	Same as Maximum Ultimate Design Wind Speed, Vult < 140 mph except all laps shall be a minimum of 4 inches
Metal roof panels	1507.4	Apply in accordance with the manufacturer's installation instructions	For roof slopes from two units vertical in 12 units horizontal (2:12), up to four units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner. Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm). End laps shall be 4 inches and shall be offset by 6 feet (1829 mm). For roof slopes of four units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 4 inches (51 mm), End laps shall be 4 inches and shall be offset by 6 feet (1829 mm).
Metal roof shingles	1507.5		
Mineral-surfaced roll roofing	1507.6		
Slate shingles	1507.7		
Wood shakes	1507.8		
Wood shingles	1507.9		
Photovoltaic shingles	1507.17	For roof slopes from three units vertical in 12 units horizontal (3:12), up to four units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied in the following manner. Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm). End laps shall be 4 inches and shall be offset by 6 feet (1829 mm). Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of four units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and	Same as Maximum Ultimate Design Wind Speed, Vult < 140 mph except all laps shall be a minimum of 4 inches

Roof Covering	Section	Maximum Ultimate Design Wind Speed, Vult < 140 mph	Maximum Ultimate Design Wind Speed, Vult ≥ 140 mph
		lapped 2 inches (51 mm), Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet (1829 mm).	

TABLE 1507.1.1(3)
Underlayment Attachment

Roof Covering	Section	Maximum Ultimate Desing Wind Speed, Vult < 140 mph	Maximum Ultimate Desing Wind Speed, Vult ≥ 140 mph
Asphalt shingles	1507.2	Fastened sufficiently to hold in place	The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. Underlayment shall be attached using metal or plastic cap nails or cap staples with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Staples shall be not less than 21 gage. Cap nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.
Clay and concrete tile	1507.3		
Photovoltaic shingles	1507.17		
Metal roof panels	1507.4	Manufacturer's installation instructions	The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. Underlayment shall be attached using metal or plastic cap nails or cap staples with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Staples shall be not less than 21 gage. Cap nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.
Metal roof shingles	1507.5		
Mineral-surfaced roll roofing	1507.6		
Slate shingles	1507.7		
Wood shingles	1507.8		
Wood shakes	1507.9		

Revise as follows:

1507.2.3 Underlayment. ~~Unless otherwise noted, required underlayment~~ Underlayment shall ~~conform to ASTM D 226, Type I, ASTM D 4869, Type I, or ASTM D 6757.~~comply with Section 1507.1.1

Delete without substitution:

~~**1507.2.4 Self-adhering polymer modified bitumen sheet.** Self-adhering polymer modified bitumen sheet shall comply with ASTM D 1970.~~

Revise as follows:

~~**1507.2.8.2**~~ **1507.2.8 Ice barrier.** ~~In areas where there has been a history of~~ When required, ice ~~forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet~~ barriers shall ~~be~~

~~used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building~~ comply with Section 1507.1.2.

~~Exception~~: ~~Detached accessory structures that contain no conditioned floor area.~~

Delete without substitution:

~~1507.2.8 Underlayment application.~~ ~~For roof slopes from two units vertical in 12 units horizontal (17-percent slope) and up to four units vertical in 12 units horizontal (33-percent slope), underlayment shall be two layers applied in the following manner. Apply a minimum 19-inch-wide (483 mm) strip of underlayment felt parallel with and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment overlapping successive sheets 19 inches (483 mm) and fasten sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal.~~

~~1507.2.8.1 High wind attachment.~~ ~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~Exception:~~ ~~As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~

Revise as follows:

1507.3.3 Underlayment. ~~Unless otherwise noted, required underlayment~~
Underlayment shall ~~conform to: ASTM D 226, Type II; ASTM D 2626 or ASTM D 6380, Class M mineral-surfaced roll roofing~~ comply with Section 1507.1.1.

Delete without substitution:

~~1507.3.3.1 Low-slope roofs.~~ ~~For roof slopes from 2 1/2 units vertical in 12 units horizontal (21-percent slope), up to four units vertical in 12 units horizontal (33-percent slope), underlayment shall be a minimum of two layers applied as follows:~~

1. ~~Starting at the eave, a 19-inch (483 mm) strip of underlayment shall be applied parallel with the eave and fastened sufficiently in place.~~
2. ~~Starting at the eave, 36-inch-wide (914 mm) strips of underlayment felt shall be applied overlapping successive sheets 19 inches (483 mm) and fastened sufficiently in place.~~

~~1507.3.3.2 High-slope roofs.~~ ~~For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be a minimum of one layer of underlayment felt applied shingle~~

~~fashion, parallel to, and starting from the eaves and lapped 2 inches (51 mm), fastened only as necessary to hold in place.~~

~~**1507.3.3.3 High wind attachment.** Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~

Revise as follows:

1507.4.5 Underlayment and high wind. Underlayment ~~applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s)~~ shall comply with ~~ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970~~Section 1507.1.1. ~~The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~

1507.5.3 Underlayment. Underlayment shall comply with ~~ASTM D 226, Type I or ASTM D 4869~~Section 1507.1.1.

Delete without substitution:

~~**1507.5.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

Revise as follows:

1507.5.4 Ice barrier. In areas where there has been a history of When required, ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet barriers shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building comply with Section 1507.1.2.

Exception: Detached accessory structures that contain no conditioned floor area.

1507.6.3 Underlayment. Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869Section 1507.1.1.

Delete without substitution:

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

Revise as follows:

1507.6.4 Ice barrier. In areas where there has been a history of When required, ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet barriers shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building comply with Section 1507.1.2.

Exception: Detached accessory structures that contain no conditioned floor area.

1507.7.3 Underlayment. Underlayment shall comply with ASTM D 226, Type II or ASTM D 4869, Type III or IVSection 1507.1.1.

Delete without substitution:

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the

~~side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~

Revise as follows:

1507.7.4 Ice barrier. ~~In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of~~ When required, ice ~~forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet~~ barriers shall ~~extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building~~ comply with Section 1507.1.2.

Exception: ~~Detached accessory structures that contain no conditioned floor area.~~

TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
1. Roof slope	Wood shingles shall be installed on slopes of not less than three units vertical in 12 units horizontal (3:12).	Wood shakes shall be installed on slopes of not less than four units vertical in 12 units horizontal (4:12).
2. Deck requirement		
Temperate climate	Shingles shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1″× 4″ nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners.	Shakes shall be applied to roofs with solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1″× 4″ nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. When 1″ × 4″ spaced sheathing is installed at 10 inches, boards must be installed between the sheathing boards.
In areas where the average daily temperature in January is 25°F or less or where there is a possibility of ice forming along the eaves causing a backup of water.	Solid sheathing is required.	Solid sheathing is required.
3. Interlayment	No requirements.	Interlayment shall comply with ASTM D 226, Type 1.
4. Underlayment		
Temperate climate	Underlayment shall comply with Section 1507.1.1 ~~ASTM D 226, Type 1~~.	Underlayment shall comply with Section 1507.1.1 ~~ASTM D 226, Type 1~~.
~~In areas where there is a possibility of ice forming along the eaves causing a backup of water.~~	~~An ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the eave"s edge to a point at least 24 inches inside the exterior wall line of~~	~~An ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the lowest edges of all roof surfaces to a point at least 24 inches inside the exterior wall line of the~~

	~~the building.~~	~~building.~~
5. Application		
Attachment	Fasteners for wood shingles shall be hot-dipped galvanized or Type 304 (Type 316 for coastal areas) stainless steel with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.	Fasteners for wood shakes shall be hot-dipped galvanized or Type 304 (Type 316 for coastal areas) with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.
No. of fasteners	Two per shingle.	Two per shake.
Exposure	Weather exposures shall not exceed those set forth in Table 1507.8.7.	Weather exposures shall not exceed those set forth in Table 1507.9.8.
Method	Shingles shall be laid with a side lap of not less than 1.5 inches between joints in courses, and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles shall be 0.25 to 0.375 inch.	Shakes shall be laid with a side lap of not less than 1.5 inches between joints in adjacent courses. Spacing between shakes shall not be less than 0.375 inch or more than 0.625 inch for shakes and taper sawn shakes of naturally durable wood and shall be 0.25 to 0.375 inch for preservative-treated taper sawn shakes.
Flashing	In accordance with Section 1507.8.8.	In accordance with Section 1507.9.9.

For SI: 1 inch = 25.4 mm, °C = [(°F) - 32]/1.8.

1507.8.3 Underlayment. Underlayment shall comply with ~~ASTM D 226, Type I or ASTM D 4869~~Section 1507.1.1.

Delete without substitution:

~~**1507.8.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

> ~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~

Revise as follows:

1507.8.4 Ice barrier. ~~In areas where there has been a history of~~ When required, ice ~~forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet~~ barriers shall ~~be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building~~ comply with Section 1507.1.2.

> **Exception:** ~~Detached accessory structures that contain no conditioned floor area.~~

1507.9.3 Underlayment. Underlayment shall comply with ~~ASTM D 226, Type I or ASTM D 4869~~Section 1507.1.1.

Delete without substitution:

~~**1507.9.3.1 Underlayment and high wind.** Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

> ~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~

Revise as follows:

1507.9.4 Ice barrier. ~~In areas where there has been a history of~~ When required, ice ~~forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet~~ barriers shall ~~be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building~~ comply with Section 1507.1.2.

> **Exception:** ~~Detached accessory structures that contain no conditioned floor area.~~

1507.17.3 Underlayment. ~~Unless otherwise noted, required underlayment~~ Underlayment shall ~~conform to ASTM D 226, ASTM D 4869 or ASTM D 6757~~comply with Section 1507.1.1.

~~**1507.17.4.2**~~ **1507.17.4 Ice barrier.** ~~In areas where there has been a history of~~ When required, ice ~~forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet~~ barriers shall ~~be used instead of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building~~ comply with Section 1507.1.1.

> **Exception:** ~~Detached accessory structures that contain no conditioned floor area.~~

Delete without substitution:

~~**1507.17.4 Underlayment application.** Underlayment shall be applied shingle fashion, parallel to and starting from the eave, lapped 2 inches (51 mm) and fastened sufficiently to hold in place.~~

~~**1507.17.4.1 High wind attachment.** Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied along the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd} is not less than 120 mph (54 m/s) shall comply with ASTM D 226, Type II, ASTM D 4869, Type IV or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in~~

~~accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3-/4 inch (19.1 mm) into the roof sheathing.~~

Exception: ~~As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~

Reason: This proposal is primarily a reorganization of the underlayment provisions contained within the IBC. In the current IBC, underlayment provisions are specified individually for each type of roof covering. Many of the roof covering provisions contain similar and overlapping requirements for underlayment type, application, and attachment. This proposal relocates the underlayment requirements for each roof covering to a single section at the beginning of Section 1507. This reorganization results in three new tables that address underlayment type, application, and attachment required for each of the roof covings in the IBC that require underlayment. Consolidating the underlayment requirements into a single section will make the provisions more user-friendly and in particular highlights the key differences between the requirements for underlayment for the different types of roof coverings addressed by the IBC. The reorganization proposed here was approved during the last code development cycle for the 2015 IRC.

This proposal also clarifies the use of ASTM D 1970 as an underlayment. The proposal does not require the use of the self-adhering membrane, as it is already permitted by the code. In fact, the existing exception for using the self-adhering membrane was requested to be included by the IBC Structural Committee, and subsequently approved by the IRC Committee during the last code change cycle so that it was clear that a self-adhering membrane was permitted as an alternative to the underlayment provisions for high wind. This proposal simply clarifies the permitted installations of the self-adhering membrane that would provide an equivalent or better level of water intrusion prevention to the underlayment requirements for high wind. The criteria specified are consistent with the IBHS Fortified program requirements for creating a "sealed roof deck". Additionally, the provisions of this proposal are the most widely accepted methods recognized by insurance companies for providing discounts and credits in hurricane-prone regions. This proposal revises the wind speed threshold that triggers the enhanced underlayment provisions from V_{asd} = 120 mph to V_{ult} = 140 mph which will make the IBC consistent with the IRC. This adjustment was approved during the last code cycle and is included in the 2015 IRC. The original code change that pegged this trigger at 120 mph was developed to correspond with the wind speed maps in the 2009 IBC and ASCE 7-05. During the 2009/2010 code cycle, the wind speed maps in the IBC and IRC have been updated for consistency with ASCE 7-10. A simple conversion of the enhanced underlayment provisions wind speed trigger does not accurately reflect the intent of the original proposal, particularly as it relates to the geographic areas affected. The trigger as originally proposed, was essentially chosen to capture the coastal areas of the hurricane-prone regions, where the potential for loss of roof covering is increased, accompanied by exposure to significant amounts of rainfall. The trigger was chosen based upon a geographic location on the wind speed map rather than a particular design limitation. However, the new maps in ASCE 7-10 have shifted the contours closer to the coast for the entire hurricane-prone region, which resulted in a reduction of the geographic area required to comply with the enhanced underlayment provisions. This proposal sets wind speed trigger for the enhanced underlayment provisions at $V_{ult} \geq 140$ mph, which corresponds better geographically with the 120 mph trigger that was intended to work the 2009 IBC wind speed maps and is consistent with the 2015 IRC.

Additionally, this proposal simply adds an additional method for preventing water penetration when the primary roof covering is lost due to high winds. Water penetration has been well document from post-hurricane damage assessments where hurricane winds were strong enough to blow off the primary roof covering, but not strong enough to blow off roof sheathing. In such instances, significant property damage and extended occupant displacement routinely occur due to water intrusion. Such damage is particularly common in inland areas, where hurricane-strength winds occur, but building codes and standards are not as stringent as in coastal jurisdictions.

While enhanced underlayment provisions are currently addressed in the code, the protection afforded by the self-adhering polymer-modified bitumen underlayment is in a bit of a different category. The 2015 IBC permits the of this product as an alternative to the enhanced underlayment (felt) provisions for roofing products address in this code change. When the self-adhering polymer-modified bitumen underlayment as described in proposed Exceptions 1 and 2 is used, the condition it creates is referred to as a "sealed roof deck" in that it prevents water from entering the building through gaps in the roof sheathing. It is also a component of the IBHS Fortified Program for creating a sealed roof deck. Recent tests conducted at the IBHS Research Facility have found the system proposed as new Exception 3, to perform similar to the self-adhering polymer-modified bitumen underlayment. As a result, this system of underlayment application and attachment is now recognized by the Fortified Program for creating a sealed roof deck. While this system is currently required in the code for roof slopes between 2:12 and 4:12, it provides an equal level of water penetration protection for roof slopes above 4:12. Incorporating this method in the code provides an option for reducing the risk of water penetration that is on par with the self-adhering polymer-modified bitumen underlayment.

Cost Impact: Will increase the cost of construction
Will result in an increase in cost in some areas. The wind speed trigger for the enhanced underlayment has been slightly lowered resulting in it applying to more areas. However, this change will achieve consistency with IRC with regards to underlayment.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

1507.1.1 Underlayment. Underlayment for asphalt shingles, clay and concrete tile, metal roof shingles, mineral surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes and metal roof panels shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D 226, D 1970, D 4869 and D 6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table 1507.1.1(1). Underlayment shall be applied in accordance with Table 1507.1.1(2). Underlayment shall be attached in accordance with Table 1507.1.1(3).

Exceptions:

1. As an alternative, self-adhering polymer modified bitumen underlayment complying with ASTM D 1970 installed in accordance with the manufacturer's installation instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed, shall be permitted.
2. As an alternative, a minimum 4-inch wide strip of self-adhering polymer modified bitumen membrane complying with ASTM D 1970 installed in accordance with the manufacturer's installation instructions for the deck material shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for design wind speeds less than 120 mph shall be applied over the 4-inch wide membrane strips.
3. As an alternative, two layers of underlayment complying with ASTM D 226 Type II or ASTM D 4869 Type IV shall be permitted to be installed as follows: Apply a 19-inch strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide strips of underlayment felt, overlapping successive sheets 19 inches. The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6- inch spacing at side and end laps. End laps shall be 4 inches and shall be offset by 6 feet (1829 mm). Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch. Thickness of the outside edge of plastic caps shall be not less than 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.
4. Structural metal panels that do not require a substrate or underlayment.

Committee Reason: This proposal reorganizes the provisions for underlayment, making them more user-friendly. The modification clarifies that metal panels do not require underlayment.

Assembly Action **None**

Final Action Results

S27-16 **AM**

Back

Code Change No: S28-16 Part I

Original Proposal

Section: 1507.17.4.1, 1507.2.4, 1507.2.8.1, 1507.2.9.2, 1507.3.3.3, 1507.3.9, 1507.4.5, 1507.5.3.1, 1507.5.7, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.8.8, 1507.9.3.1, 1507.9.9

Proponent: Mike Fischer, Kellen, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1507.2.4 Self-adhering polymer modified bitumen sheet. Self-adhering polymer modified bitumen sheet shall ~~comply~~ bear a label indicating compliance with ASTM D 1970.

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.2.9.2 Valleys. Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least 24 inches (610 mm) wide and of any of the corrosion-resistant metals in Table 1507.2.9.2.
2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing complying with ASTM D 3909 or ASTM D 6380 shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valleys covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380, and at least 36 inches (914 mm) wide or types as described in Item 1 or 2 above shall be permitted. Self-adhering polymer modified bitumen underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted in lieu of the lining material.

Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.3.9 Flashing. At the juncture of the roof vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall not be less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley, or a self-adhering polymer-modified bitumen sheet ~~complying~~ bearing a label indicating compliance with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solid cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, or ASTM D 4869 Type IV~~, or ASTM D 1970~~. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.5.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67

mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.5.7 Flashing. Roof valley flashing shall be of corrosion-resistant metal of the same material as the roof covering or shall comply with the standards in Table 1507.4.3(1). The valley flashing shall extend at least 8 inches (203 mm) from the centerline each way and shall have a splash diverter rib not less than $^{3}/_{4}$ inch (19.1 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing shall have a 36-inch-wide (914 mm) underlayment directly under it consisting of either one layer of underlayment running the full length of the valley or a self-adhering polymer-modified bitumen sheet ~~complying~~ bearing a label indicating compliance with ASTM D 1970, in addition to underlayment required for metal roof shingles. The metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for roof slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.8.8 Flashing. At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall be not less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley or a self-adhering polymer-modified bitumen sheet ~~complying~~ bearing a label indicating compliance with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

1507.9.9 Flashing. At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall be not less than 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley or a self-adhering polymer-modified bitumen sheet ~~complying~~ bearing a label indicating compliance with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a

backup of water, the metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.

1507.17.4.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied along the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd} is not less than 120 mph (54 m/s) shall comply with ASTM D 226, Type II, ASTM D 4869, Type IV or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

> **Exception:** As an alternative, adhered underlayment ~~complying~~ bearing a label indicating compliance with ASTM D 1970 shall be permitted.

Reason: Roofing underlayments are a critical component and provide protection to the roof deck and other components during installation as well as replacements and after storm events. The proposal adds a requirement that self-adhering underlayments bear a label to demonstrate compliance to the code. The labeling requirement for underlayments was part of a comprehensive proposal for the IRC by IBHS in the past cycle; it is hoped that a similar proposal will be approved for the IBC this year. The proposal also adds photovoltaic shingles to the list of roof covering materials requiring labeled underlayment materials in the IRC.

Cost Impact: Will increase the cost of construction
Will require products bear a label, which will add product approval costs. The IRC already contains an underlayment labeling requirement, so the cost impact is expected to be minimal.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This code change levels the playing field for underlaymnet by clarifying the requirement for labeling.

Assembly Action **None**

Final Action Results

S28-16 Part I **AS**

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Code Change No: S30-16

Original Proposal

Section: 1507.2.5

Proponent: Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net); T. Eric Stafford, PE, representing Institute for Business and Home Safety (testafford@charter.net)

Revise as follows:

1507.2.5 Asphalt shingles. Asphalt shingles shall comply with ~~ASTM D 225 or~~ ASTM D 3462.

Reason:
WILEN: ASTM D 225 has been withdrawn by ASTM and thus should no longer be referenced in IBC as a material standard for asphalt shingles with organic felt. Organic shingles are no longer available and a similar change was approved for removing ASTM D 255 from Chapter 9 of IRC for the 2015 edition (RB417-13). This change will make IBC Section 1507.2.5 consistent with IRC Section R905.2.4.

STAFFORD: ASTM D 225 was withdrawn by ASTM International in 2012 because shingles with organic felt are no longer produced by U.S manufacturers, nor are these products available on the market. Code change RB417–13 removed ASTM D 225 from the IRC for the same reason. The recognized standard specification for asphalt shingles is ASTM D 3462.

Cost Impact: Will not increase the cost of construction
The proposed change does not change the stringency of existing code requirements so the cost of construction will be unchanged.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal removes the reference to an ASTM standard that has been withdrawn.

Assembly Action **None**

Final Action Results

S30-16	**AS**

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Code Change No: S31-16

Original Proposal

Section: 1507.17.4.1, 1507.2.8.1, 1507.3.3.3, 1507.4.5, 1507.5.3.1, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.9.3.1

Proponent: Andy Williams, representing International Staple, Nail, and Tool Association (afwilliams@Connect2amc.com)

Revise as follows:

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.3.3.3 High wind attachment. Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of ~~at least~~ not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.5.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof

sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)]

sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.17.4.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied along the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd} is not less than 120 mph (54 m/s) shall comply with ASTM D 226, Type II, ASTM D 4869, Type IV or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using cap nails or cap staples. Caps shall be metal or plastic ~~cap nails~~ with a nominal head diameter of not less than 1 inch (~~25~~25.4 mm) ~~with~~. Metal caps shall have a thickness of ~~not less than~~ at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. ~~The cap nail~~ Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). Cap-nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] ~~with~~. Staple gage shall be not less than 21 gage [0.032 inch (0.81mm)]. Cap-nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

Reason: This code change proposal is identical to the proposal approved as submitted by ISANTA in 2013 for the 2015 IRC.
The IBC requirement for cap nails for attachment of roof covering underlayment in high-wind areas does not reflect commercially available cap staples successfully used in roofing material application. This proposal expands fastener alternatives to include cap staples based on testing which indicates the underlayment tears before the proposed cap staples fail. The cap staple bearing area on the underlayment is the same as for the cap nail - as determined by the cap diameter.
Testing was conducted in general accordance with ASTM D4869 using Type IV underpayment ("30 pound"). That underpayment is at the high end of the thickness and toughness range of code-required underlayment which makes this a "worst case test" for the cap staples.

The test procedure and results are as follows
Report on Testing
July 2012
Testing was performed by Stanley Black & Decker at the request of Internaitonal Staple, Nail and Tool Association (ISANTA)

Materials

- Roofing paper, 30# (ASTM D4869, Type IV)
- Sheathing material - 4-ply, 15/32-inch. Southern Pine Plywood, cut in 2 by 2 inch squares
- Fasteners - Ring shank cap nails with nail shank diameters before threading of 0.083 inch and 0.105 inch. Cap staples, 18 gage and 21 gage.
- Caps - 1 inch diameter plastic caps

Method
The test method was designed to facilitate one of three potential failure modes: cap failure, fastener withdrawal, or cap pulling through the underlayment. A 14 x 14 inch sheet of underlayment was cut from the roll. the cap-fastener was driven through the center of the underlayment sheet into a 2x2 inch block of sheathing matrail. The assembled test specimen was turned over so that the sheathing block was visible and the fastener head was down. The assembled speciment was secured in the test fixture base with the fastener centered below the sheathing block clamping fixture. The sheathing block was clamped by the fixture attached to the traversing head of the test machine. The test specimen was loaded at a constant displacement of 1 inch/minute until failure. Load and displacement were measured continuously during the test. Failure mode was observed and peak force was recorded as the failure load. Photographs are attached.

Discussion
The test is intended to evaluate the functionality of the ISANTA proposal for adding additionalcommercially available cap fasteners for use on the same spacing as IBC's 0.105" cap nail with a plastic or metal 1" diameter cap (as specified).The underlayment is not wind qualified. However, AC188 evaluation includes a requirement for tensile strength by using one of threeASTM standards, for example, ASTM D412. The AC does not include a punch-through or pull-through evaluation. The minimum tensile strength criterion of AC 188 is 20 lbf/inch-width. The 20 lbf/inch-width is a valuable benchmark in that it could also be used to assess the potential uplift resistance of teh underlayment because that is controlled by tensile strength.

Tensile strength also appears to be a predictor of pull through performance. The 1-inch caps generally pulled through the underlayment at approximately 32 lb. Some nonlinear behaviour occurs at the start of the loading process, then the load-deflection diagram becomes linear and as the load approaches the maximum a minor plastic region develops that reflects fiber separation and cap yielding. This was generally characteristic for all cap-fasteners.

Conclusions

From the testing and review of test standardsand acceptance criteria, we can conclude that the underlayment minimum tensile strength is teh controlling strength property of the system and is can be used as a reasonable approximation of the potential holding capacity of the cap-fasteners based on the cap diameter. Engineering analysis of the negative pressures on roof surfaces should provide reasonble estimates of expected forces that will be resisted by fasteners and can be used to establish fastening schedules that reflect the fastener holding capacity (pull-through or withdrawal) and tensile strength of the underlayment when loaded as a membrane between fasteners.

Results of Cap Fastener Testing with ASTM D4869, Type IV Underlayment
(# of Failures, By Failure Mode)

Cap Fastener[1]	Failure Load (pounds)	Fastener Withdrawl	Cap Failure	Underlayment Tear
"Code Nail" 2012 IBC Cap Nail 0.105" nail diameter ring shank nail	31.8	1	7	8
0.083" nail diameter ring shank nail	32.4	0	4	2
21 Gage staple	36.2	0	0	5
18 Gage staple	32.1	0	2	9

References:
State of Florida

- Testing Application Standards (TAS) published in the State of Florida Buildign Code 2007 for High Velocity Hurricane Zone (HVHZ) product approval testing.
- TAS 111(B)-95, Test Procedure for Edge Metal Pull-off Performance
- TAS 117(C)-95, Test Procedure for Dynamic Pull-off Performance of Roofing Nail Heads or Fasteners with Bearing Plates
- TAS 117(A)-95, Test Procedure for Withdrawl Resistance Testing of MEchanical Fasteners Used in Roof System Assemblies
- TAS 117(B)-95, Test Procedure for Dynamic pull-through Performance of Roofing Membranes over Fastener Heads or Fasteners with Metal Bearing Plates.

ASTM Standards

- ASTM D1037, Standard Test Methods for Evaluating Properties of Wood-base fiber and Particle Panel Materials, Nail head Pull-through Test.
- ASTM D4869, Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
- ASTM D412, Test MEthod for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

Acceptance Criteria

- ICC-ES, AC188: Acceptance Criteria for Roof Underlayments. July 2007.

Cost Impact: Will not increase the cost of construction
Recognition of these cap nails and staples should provide greater choice to the end user of those products that are already commercially available and allowed by the IRC.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal adds requirements for cap nails and provides specificity on how they are to used.

Assembly Action **None**

Final Action Results

S31-16 **AS**

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Code Change No: S32-16

Original Proposal

Section: 1507.17.4.1, 1507.2.8.1, 1507.3.3.3, 1507.4.5, 1507.5.3.1, 1507.6.3.1, 1507.7.3.1, 1507.8.3.1, 1507.9.3.1

Proponent: Andy Williams (afwilliams@Connect2amc.com)

Revise as follows:

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.3.3.3 High wind attachment. Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied

with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.5.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch (0.25mm). Minimum thickness of the outside edge of plastic caps shall be 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.10 5~~0.083 inch (~~2.67~~ 2.11 mm)~~]~~ ~~with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.

Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the

roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

1507.17.4.1 High wind attachment. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied along the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd} is not less than 120 mph (54 m/s) shall comply with ASTM D 226, Type II, ASTM D 4869, Type IV or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) ~~with~~. Metal caps shall have a thickness of ~~not less than~~ at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25mm). Thickness of the outside edge of plastic caps shall be 0.035 inch (0.89mm). The ~~cap nail~~ cap-nail shank shall be a minimum of ~~12 gage [0.105~~ 0.083 inch (~~2.67~~ 2.11 mm)~~] with~~ for ring shank cap nails and 0.091 inch (2.31mm) for smooth shank cap nails. Cap nails shall have a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.

Reason: This code change proposal is identical to the proposal approved as submitted by ISANTA in 2013 for the 2015 IRC.

The cap nails listed for attachment of roof covering underlayment in high-wind areas does not reflect commercially available cap staples successfully used in roofing material application. IBC presently lists a minimum nail shank of 0.105". This proposal lowers the minimum shank diameter based on tests indicating that the underlayment tears prior to failure of the proposed cap nail. (Minimum diameter of 0.083" for ring shank nails and minimum diameter of 0.091" for smooth shank cap nails.)
Testing was conducted in general accordance with ASTM D4869 using Type IV underpayment ("30 pound"). That underpayment is at the high end of the thickness and toughness range of code-required underlayment which makes this a "worst case test" for the fastener. This proposal addresses both commercially available hand-driven and power-driven cap-nails.

The test procedure and results are as follows
Report on Testing
July 2012
Testing was performed by Stanley Black & Decker at the request of International Staple, Nail and Tool Association (ISANTA)

Materials

- Roofing paper, 30# (ASTM D4869, Type IV)
- Sheathing material - 4-ply, 15/32-inch. Southern Pine Plywood, cut in 2 by 2 inch squares
- Fasteners - Ring shank cap nails with nail shank diameters before threading of 0.083 inch and 0.105 inch. Cap staples, 18 gage and 21 gage.
- Caps - 1 inch diameter plastic caps

Method
The test method was designed to facilitate one of three potential failure modes: cap failure, fastener withdrawal, or cap pulling through the underlayment. A 14 x 14 inch sheet of underlayment was cut from the roll. the cap-fastener was driven through the center of the underlayment sheet into a 2x2 inch block of sheathing material. The assembled test specimen was turned over so that the sheathing block was visible and the fastener head was down. The assembled specimen was secured in the test fixture base with the fastener centered below the sheathing block clamping fixture. The sheathing block was clamped by the fixture attached to the traversing head of the test machine. The test specimen was loaded at a constant displacement of 1 inch/minute until failure. Load and displacement were measured continuously during the test. Failure mode was observed and peak force was recorded as the failure load. Photographs are attached.

Discussion
The test is intended to evaluate the functionality of the ISANTA proposal for adding additional commercially available cap fasteners for use on the same spacing as IBC's 0.105" cap nail with a plastic or metal 1" diameter cap (as specified).The underlayment is not wind qualified. However, AC188 evaluation includes a requirement for tensile strength by using one of three ASTM standards, for example, ASTM D412. The AC does not include a punch-through or pull-through evaluation. The minimum tensile strength criterion of AC 188 is 20 lbf/inch-width. The 20 lbf/inch-width is a valuable benchmark in that it could also be used to assess the potential uplift resistance of teh underlayment because that is controlled by tensile strength.

Tensile strength also appears to be a predictor of pull through performance. The 1-inch caps generally pulled through the underlayment at approximately 32 lb. Some nonlinear behavior occurs at the start of the loading process, then the load-deflection diagram becomes linear and as the load approaches the maximum a minor plastic region develops that reflects fiber separation and cap yielding. This was generally characteristic for all cap-fasteners.

Conclusions
From the testing and review of test standards and acceptance criteria, we can conclude that the underlayment minimum tensile strength is the controlling strength property of the system and is can be used as a reasonable approximation of the potential holding capacity of the cap-fasteners based on the cap diameter. Engineering analysis of the negative pressures on roof surfaces should provide reasonable estimates of expected forces that will be resisted by fasteners and can be used to establish fastening schedules that reflect the fastener holding capacity (pull-through or withdrawal) and tensile strength of the underlayment when loaded as a membrane between fasteners.

Results of Cap Fastener Testing with ASTM D4869, Type IV Underlayment
(# of Failures, By Failure Mode)

Cap Fastener[1]	Failure Load (pounds)	Fastener Withdrawl	Cap Failure	Underlayment Tear
"Code Nail" 2012 IBC Cap Nail 0.105" nail diameter ring shank nail	31.8	1	7	8
0.083" nail diameter ring shank nail	32.4	0	4	2
21 Gage staple	36.2	0	0	5
18 Gage staple	32.1	0	2	9

References:
Reference Standards
State of Florida

- Testing Application Standards (TAS) published in the State of Florida Buildign Code 2007 for High Velocity Hurricane Zone (HVHZ) product approval testing.
- TAS 111(B)-95, Test Procedure for Edge Metal Pull-off Performance
- TAS 117(C)-95, Test Procedure for Dynamic Pull-off Performance of Roofing Nail Heads or Fasteners with Bearing Plates
- TAS 117(A)-95, Test Procedure for Withdrawl Resistance Testing of MEchanical Fasteners Used in Roof System Assemblies
- TAS 117(B)-95, Test Procedure for Dynamic pull-through Performance of Roofing Membranes over Fastener Heads or Fasteners with Metal Bearing Plates.

ASTM Standards

- ASTM D1037, Standard Test Methods for Evaluating Properties of Wood-base fiber and Particle Panel Materials, Nail head Pull-through Test.
- ASTM D4869, Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
- ASTM D412, Test MEthod for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

Acceptance Criteria

- ICC-ES, AC188: Acceptance Criteria for Roof Underlayments. July 2007.

Cost Impact: Will not increase the cost of construction
Recognition of these ring shank and smooth cap nails should provide greater choice to the end user of those products that are already commercially available and allowed by the IRC.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This code change allows the use of ring shank cap nails and provides specificity on how they are to be used.

Assembly Action **None**

Final Action Results

S32-16 **AS**

Back

Code Change No: S39-16

Original Proposal

Section: 1507.8.9 (New), 1507.9.9 (New)

Proponent: David Roodvoets, Cedar Shake and Shingle Buresu, representing Cedar Shake and Shingle Bureau (davelee@ix.netcom.com)

Add new text as follows:

1507.8.9 Label Required. Each bundle of shingles shall be identified by a label of an approved grading or inspection bureau or agency.

1507.9.9 Label Required. Each bundle of shakes shall be identified by a label of an approved grading or inspection bureau or agency.

Reason: Labels need to be on the bundles of shakes and shingles so that building inspectors, contractors, architects, and owners can determine if the code compliant products are being installed.

Cost Impact: Will not increase the cost of construction
Most bundles of shakes and shingles are appropriately labeled now, however some non-compliant products do not have a label, leaving questions as to suitability when being installed. Labels are required by the Cedar Shake and Shingle Bureau now, so manufactures are already adding this minor cost to the distribution of the products.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee feels that requiring labels on bundles of wood shakes and shingles makes sense.

Assembly Action **None**

Final Action Results

S39-16	**AS**

Back

Code Change No: S40-16

Original Proposal

Section: 1507.9.6, 1807.1.4, 2303.1.9

Proponent: Colin McCown, representing American Wood Protection Association

Revise as follows:

TABLE 1507.9.6
WOOD SHAKE MATERIAL REQUIREMENTS

MATERIAL	MINIMUM GRADES	APPLICABLE GRADING RULES
Wood shakes of naturally durable wood	1	CSSB
Taper sawn shakes of naturally durable wood	1 or 2	CSSB
Preservative-treated shakes and shingles of naturally durable wood	1	CSSB
Fire-retardant-treated shakes and shingles of naturally durable wood	1	CSSB
Preservative-treated taper sawn shakes of Southern pine treated in accordance with AWPA U1 (Commodity Specification A, Special Requirement 4.6 ~~Use Category 3B and Section 5.6~~)	1 or 2	TFS

CSSB = Cedar Shake and Shingle Bureau.
TFS = Forest Products Laboratory of the Texas Forest Services.

1807.1.4 Permanent wood foundation systems. Permanent wood foundation systems shall be designed and installed in accordance with AWC PWF. Lumber and plywood shall be preservative treated in accordance with AWPA U1 (Commodity Specification A, ~~Use Category 4B and Section 5.2~~ Special Requirement 4.2) and shall be identified in accordance with Section 2303.1.9.1.

2303.1.9 Preservative-treated wood. Lumber, timber, plywood, piles and poles supporting permanent structures required by Section 2304.12 to be preservative treated shall conform to ~~the requirements of the applicable~~ AWPA ~~Standard~~ U1 and M4 ~~for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1~~. Lumber and plywood used in permanent wood foundation systems shall conform to Chapter 18.

Reason: The existing text was outdated, requiring clarification and updates to current AWPA section numbering.

Cost Impact: Will not increase the cost of construction
These changes merely clarify and update the existing text without any impact on the required specifications for materials used.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Agreement with proponent's reason which indicates that the proposal is making needed updates to outdated AWPA section references.

Assembly Action **None**

Final Action Results

S40-16 **AS**

Back

Code Change No: S43-16 Part I

Original Proposal

Section: 1507.11.1, 1507.11.2, 1507.11.2.1 (New)

Proponent: Mike Fischer, Kellen, representing Asphalt Roofing Manufacturers Association (mfischer@kellencompany.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

Revise as follows:

1507.11.1 Slope. Modified bitumen ~~membrane roofs~~ roofing shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

1507.11.2 Material standards. Modified bitumen ~~roof coverings~~ roofing materials shall comply with CGSB 37-GP-56M, ASTM D 6162, ASTM D 6163, ASTM D 6164, ASTM D 6222, ASTM D 6223, ASTM D 6298 or ASTM D 6509.

Add new text as follows:

1507.11.2.1 Base sheet. A base sheet that complies with the requirements of 1507.11.2, ASTM D 4601, or ASTM D 1970 shall be permitted to be used with a modified bitumen cap sheet.

Reason: The proposal includes a change to terminology for modified bitumen roofing materials for consistency with referenced standards and industry terminology. In addition, it includes a new section permitting the use of base sheet materials that comply with ASTM D 1970, ASTM D4601, or other standards as applicable.

Cost Impact: Will not increase the cost of construction
The proposal increases product options.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Per the proponent's reason which indicates that this change introduces terminology that is more consistent with industry. The committee also suggests a public comment to replace "shall be permitted".

Assembly Action **None**

Final Action Results

S43-16 Part I **AS**

Back

Code Change No: S44-16

Original Proposal

Section: 1507.14.2

Proponent: Mike Fischer, Kellen, representing The Center for the Polyurethanes Industry of the American Chemistry Council (mfischer@kellencompany.com)

Revise as follows:

1507.14.2 Material standards. Spray-applied polyurethane foam insulation shall comply with ASTM C 1029 Type III or IV ~~as defined in~~, or ASTM ~~C 1029~~ D7425.

Reference standards type: This is an update to reference standard(s) already in the ICC Code Books
Add new standard(s) as follows:

ASTM D 7425/D 7425M—11 Standard Specification for Spray Polyurethane Foam Used for Roofing Application

Reason: The proposal adds in an alternate referenced standard applicable to spray-applied polyurethane foam insulation in roofing. ASTM D7425 is referenced in the 2015 IRC (Section R1905.14.2); it is added here for consistency.

Cost Impact: Will not increase the cost of construction
The proposal increases options for material suppliers; thus will increase product availability.

Analysis: The standard proposed for inclusion in this code, ASTM D7425, is referenced in the International Residential Code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal provides an additional option for spray-applied polyurethane foam insulation by adding a referenced standard which coordinates this section with the IRC.

Assembly Action **None**

Final Action Results

S44-16	**AS**

Back

Code Change No: S47-16

Original Proposal

Section: 1507.17.2 (New)

Proponent: Lorraine Ross, representing The Dow Chemical Company (Intech@tampabay.rr.com)

Add new text as follows:

1507.17.2 Deck Slope. *Photovoltaic shingles* shall be installed on roof slopes of not less than two units vertical in 12 units horizontal (2:12).

Reason: This proposal revises the minimum roof deck slope for the installation of photovoltaic shingles. The minimum of 2:12 slope is in conformance with an accepted slope for these products in the International Residential Code. The section was also edited for clarity.

Cost Impact: Will not increase the cost of construction
This proposal is a clarification of roof deck requirements for PV shingles. It does not increase the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal establishes a suitable minimum pitch for installing photovoltaic shingles. There is a some concern with the wording "shall be installed".

Assembly Action **None**

Final Action Results

S47-16	**AS**

Back

Code Change No: S49-16

Original Proposal

Section: [BG] 1510.7.1

Proponent: Joseph Cain, SunEdison, representing Solar Energy Industries Association (SEIA) (joecainpe@aol.com)

Delete without substitution:

~~**[BG] 1510.7.1 Wind resistance.** Rooftop-mounted *photovoltaic panels* and *modules* shall be designed for component and cladding wind loads in accordance with Chapter 16 using an effective wind area based on the dimensions of a single unit frame.~~

Reason: The expansion of Section 3111 in the International Building Code by Proposal G211-15 in the Group A cycle covers all that is within Section 1510.7 and its subsections, so Section 1501.7 is no longer needed. Further, ASCE 7-16 will include wind load calculation methods specific to rooftop solar photovoltaic systems, including PV systems installed parallel to a pitched roof in Section 29.4.4. This proposal to delete Section 1510.7 will remove conflicts with Section 3111 and ASCE 7-16.

2015 IBC Section 1510.7.1 (Section 1509.7.1 in 2012 IBC) requires the use of "an effective wind area based on the dimensions of a single unit frame." This requirement is inconsistent with ASCE 7.

In ASCE 7-10, Effective Wind Area is defined in Section 26.2 as follows:
EFFECTIVE WIND AREA, A: The area used to determine (GCp). For component and cladding elements, the effective wind area in Figs. 30.4-1 through 30.4-7, 30.5-1, 30.6-1, and 30.8-1 through 30.8-3 is the span length multiplied by an effective width that need not be less than one-third the span length. For cladding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.

In Wind loads on low profile solar photovoltaic systems on flat roofs (SEAOC-PV2-2012), the Structural Engineers Association of California includes a thorough discussion of effective wind area for photovoltaic panel systems within a commentary section of the paper. The closing statement of this commentary section in PV2 by SEAOC addresses the difference between IBC (2012 & 2015) and ASCE definitions:

The requirements and commentary above differ from the provision of IBC 2012 Section 1509.7.1, which states, "Rooftop mounted photovoltaic systems shall be designed … using an effective wind area based on the dimensions of a single unit frame." It is the consensus opinion of the SEAOC Solar Photovoltaic Systems Committee that this provision is not appropriate for many types of systems and parts of solar arrays. The provision can be un-conservative for a fastener with tributary area less than a "single unit frame" and is overly conservative for elements of a solar array, such as main supports or members that have a tributary area of several solar modules. The provision may also be overly conservative if applied to a framing member of a building supporting multiple attachments from a solar array.

In the 2013 California Building Code, the California Division of State Architect – Structural Safety (DSA-SS) revised 2012 IBC Section 1509.7.1 (which became 1510.7.1 in the 2015 IBC). This amendment was also adopted by the Building Standards Commission and Housing & Community Development. The amendment provided an exception to refer to IBC Chapter 16 and the definition of effective wind area in ASCE 7 Section 26.2, as follows:

1509.7 Photovoltaic systems. Rooftop mounted photovoltaic systems shall be designed in accordance with this section.

1509.7.1 Wind resistance. Rooftop mounted photovoltaic systems shall be designed for wind loads for component and cladding in accordance with Chapter 16 using an effective wind area based on the dimensions of a single unit frame.

Exception: [BSC, HCD-1, HCD-2, DSA-SS/CC] *The effective wind area shall be in accordance with Chapter 16 and ASCE 7 Section 26.2.*

To further support this topic, a proposal was submitted by SEAOC for ASCE 7-16 to specifically reference EWA for photovoltaic panel systems. ASCE 7-16 is still under development. Chapter 26 has been balloted successfully by the Wind Loads Subcommittee. In DRAFT ASCE 7-16, Effective Wind Area is defined in Section 26.2 as follows:

[DRAFT] EFFECTIVE WIND AREA, A: The area used to determine the external pressure coefficient (GCp) and (GCrn). For C&C elements, the effective wind area in Figs. 30.3-1 through 30.3-7, 30.5-1, 30.5-1, and 30.7-1 through 30.7-3 is the span length multiplied by an effective width that need not be less than one-third the span length. For rooftop solar arrays, the effective wind area in Fig. 29.4-7 is equal to the tributary area for the structural element being considered, except that the width of the effective wind area need not be less than one-third its length. For cladding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.

With the solar-specific definition of effective wind area in ASCE 7, there is no need for Section 1510.7.1.

Cost Impact: Will not increase the cost of construction
This proposal will not increase the cost of construction, as it is intended to coordinate the code with prior action approved under Group A code development.

Analysis: *Wind loads on low profile solar photovoltaic systems on flat roofs*, Report SEAOC-PV2-2012, Structural Engineers Association of California, August 2012.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This code change removes a code provision that is in conflict with the referenced load standard, ASCE 7. There is no reason for deviating.

Assembly Action **None**

Final Action Results

S49-16 **AS**

Code Change No: S51-16 Part I

Original Proposal

Section: IBC: 1511.3.1, 202 (New); IEBC: , [BS] 706.3.

Proponent: James Kirby, representing Roof Coating Manufacturers Association, representing Center for Environmental Innovation in Roofing (jkirby@kellencompany.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC-BUILDING CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1511.3.1 Roof recover. The installation of a new roof covering over an existing roof covering shall be permitted where any of the following conditions occur:

1. Where the new roof covering is installed in accordance with the roof covering manufacturer's approved instructions.
2. Complete and separate roofing systems, such as standing-seam metal roof panel systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
3. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1511.4.
4. The application of a new protective *roof* coating over an existing protective *roof coating*, metal roof panel, metal roof shingle, mineral surfaced roll roofing, built-up roof, modified bitumen roofing, thermoset and thermoplastic single-ply roofing and spray polyurethane foam roofing system shall be permitted without tear off of existing roof coverings.

Add new definition as follows:

ROOF COATING. A fluid-applied and fully adhered coating used for roof maintenance, *roof repair*, or as a component of a *roof covering system* or *roof assembly*.

2015 International Existing Building Code

Add new definition as follows:

ROOF COATING. A fluid-applied and fully adhered coating used for roof maintenance, *roof repair*, or as a component of a *roof covering system* or *roof assembly*

Revise as follows:

[BS] 706.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.

3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 706.4.
3. ~~The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.~~
3. The application of a new protective *roof* coating over an existing protective *roof coating*, metal roof panel, metal roof shingle, mineral surfaced roll roofing, built-up roof, modified bitumen roofing, thermoset and thermoplastic single-ply roofing and spray polyurethane foam roofing system shall be permitted without tear off of existing roof coverings.
4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507 of the *International Building Code*.

Reason: The proposal clarifies the enforcement process by adding additional substrates (i.e., existing roof coverings) that are acceptable for the installation of a roof coating.

Cost Impact: Will not increase the cost of construction
This will likely reduce the cost of construction when questions are raised about the appropriate use of a roof coating on existing roofs.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

2015 International Building Code

ROOF COATING. A fluid-applied ~~and fully~~ adhered coating used for roof maintenance*, roof repair*, or as a component of a *roof covering system* or *roof assembly.*

2015 International Existing Building Code

ROOF COATING. A fluid-applied ~~and fully~~ adhered coating used for roof maintenance*, roof repair*, or as a component of a *roof covering system* or *roof assembly*

Committee Reason: This proposal updates reroofing requirements for consistency with industry practice for commonly used materials. The new definitions provide needed consistency between the IBC and the IEBC. The modification makes necessary corrections to address industry concerns. The committee had some concern over the introduction of a laundry list in the new wording as well as the lack of a direct tie to the material standards in Chapter 15.

Assembly Action None

Final Action Results

S51-16 Part I **AM**

2018 IBC (General) Overlapping Provisions

G133-15

Table 1006.2.1 Space with one exist or exit access doorway. Revise as follow:

Change the "Maximum occupant load of space" for both "R-2" and "R-3" from "10" to "49".

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM
A, E, F-1, M, R, ~~S-~~	200	250[b]
S-1	200	400[b]

No change to the remaining text within the table and footnotes

G137-15

505.2.1 Area limitation. (No Change)

Exceptions:

1. – 2. (No Change)

3. In sprinklered Group S2 occupancies of Type III construction, the enclosed and unenclosed areas under mezzanines shall be allowed to be included when calculating the permissible size of mezzanines.

G138-15

505.2.1 Area limitation. (No Change)

Exceptions:

1. – 2. (No Change)

3. In sprinklered Group S2 occupancies of Type III construction, the enclosed and unenclosed areas under mezzanines shall be allowed to be included when calculating the permissible size of mezzanines.

G202-15

3007.6 Fire service access elevator lobby. The fire service access elevator shall open into a fire service access elevator lobby in accordance with Sections 3007.6.1 through 3007.6.5. Egress is permitted through the elevator lobby in accordance with Item 1 if Section 1016.2.
Exceptions:

1. Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to open into an elevator lobby in accordance with Section 3007.6.1.

2. Where a fire service access elevator is required, a 1-hour fire-rated fire service access elevator lobby with direct access from the fire service access elevator is not required if the fire service access elevator opens into an exit access corridor that is no less than 6 feet wide for its entire length and is at least 150 square feet with the exception of door openings, and has a minimum 1-hour fire rating with three- quarter hour fire and smoke rated openings; and during a fire event the fire service access elevator is pressurized and floor- to-floor smoke control is provided.

Exception: Where transient residential occupancies occur at floor levels more than 420 feet above the level of fire service access, a 1-hour fire-rated service access elevator lobby with direct access from the fire service access elevator is required.

3007.9.1 Access. The *exit* enclosure containing the standpipe shall have access to the floor without passing through the fire service access elevator lobby.

Exception: Group R1 and R2 occupancy buildings. Standpipes in high-rise buildings of Group R1 or R2 must be located in stairwells and are subject only to the requirements of the Florida Fire Prevention Code and NFPA 14, Standard for the Installation of Standpipes and Hose Systems, adopted by the State Fire Marshal.

G220-15

3105.3.4.1

Fabric used for awnings or fabric-covered frames shall meet the flame propagation performance criteria of NFPA 701 or have a *flame spread index* not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

Exception: Awnings or fabric-covered frames used in conjunction with Group R-3 occupancies.

3105.3.4.2

Supports for fabric awnings and fabric-covered frame shall be of metal or similar durable material.

G223-15

SECTION 458
MANUFACTURED BUILDINGS

Change Section 458.1 to read as shown:

458.1 General. The following administrative requirements for inspection and plan review apply to manufactured buildings including factory-built schools. Additional technical requirements for factory-built schools can be found in Section 453.

Note: See Department of Business and Professional Regulation Rule 61-41 ~~9B-1~~, *Florida Administrative Code* and Chapter 553, *Florida Statutes*.

G32-16

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities. • Screen enclosures.
II	Buildings and other structures except those listed in Risk Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing Group E occupancies with an occupant load greater than 250. • Buildings and other structures containing educational occupancies for

	students above he 12th grade with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident care recipients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000a. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Risk Category IV. • Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the ~~*International*~~ *Florida Fire Prevention Code*; and Are sufficient to pose a threat to the public if releasedb.
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Group I-2 occupancies having surgery or emergency treatment facilities. • Fire, rescue, ambulance and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Risk Category IV structures. • Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the ~~*International*~~ *Florida Fire Prevention Code*; and

	Are sufficient to pose a threat to the public if releasedb. • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.1.2 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

G22-15 Back

1502.1 Definitions.
~~The following terms are defined in Chapter 2:~~
The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein

S2-16 Back

1503.2 Flashing. Flashings shall be used to seal roofing systems, where the system is interrupted or terminated and shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.

S8-16, Part I Back

1504.1 Wind resistance of roofs. Roof decks and roof coverings shall be designed for wind loads in accordance with Chapter 16 and Sections 1504.2, 1504.3 and 1504.4.

1504.1.1 Wind resistance of asphalt shingles. Asphalt shingles shall be ~~tested in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table 1504.1.1 for the appropriate maximum basic~~designed for wind speeds in accordance with Section 1507.2.7. ~~Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table 1504.1.1.~~

~~Exception: Asphalt shingles that are not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table 1504.1.1.~~

TABLE 1504.1.1

CLASSIFICATION OF ASPHALT SHINGLES

~~MAXIMUM BASIC WIND SPEED V_{ult} FROM FIGURE 1609A, B, C or ASCE 7~~	~~MAXIMUM BASIC WIND SPEED, V_{asd}, FROM TABLE 1609.3.1~~	~~ASTM D 7158[a] CLASSIFICATION~~	~~ASTM D 3161 CLASSIFICATION~~
~~110~~	~~85~~	~~D, G or H~~	~~A, D or F~~
~~116~~	~~90~~	~~D, G or H~~	~~A, D or F~~
~~129~~	~~100~~	~~G or H~~	~~A, D or F~~
~~142~~	~~110~~	~~G or H~~	~~F~~
~~155~~	~~120~~	~~G or H~~	~~F~~
~~168~~	~~130~~	~~H~~	~~F~~
~~181~~	~~140~~	~~H~~	~~F~~
~~194~~	~~150~~	~~H~~	~~F~~

~~**For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.**~~

~~**a. The standard calculations contained in ASTM D 7158 assume Exposure Category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.**~~

S14-16 Back

TABLE 1504.1.1

CLASSIFICATION OF ASPHALT SHINGLES

~~MAXIMUM BASIC WIND SPEED V_{ult} FROM FIGURE 1609A, B, C or ASCE 7~~	~~MAXIMUM BASIC WIND SPEED, V_{asd}, FROM TABLE 1609.3.1~~	~~ASTM D 7158[a] CLASSIFICATION~~	~~ASTM D 3161 CLASSIFICATION~~
~~110~~	~~85~~	~~D, G or H~~	~~A, D or F~~
~~116~~	~~90~~	~~D, G or H~~	~~A, D or F~~
~~129~~	~~100~~	~~G or H~~	~~A, D or F~~
~~142~~	~~110~~	~~G or H~~	~~F~~
~~155~~	~~120~~	~~G or H~~	~~F~~
~~168~~	~~130~~	~~H~~	~~F~~
~~181~~	~~140~~	~~H~~	~~F~~
~~194~~	~~150~~	~~H~~	~~F~~

~~**For SI: 1 foot = 304.8 mm; 1 mph = 0.447 m/s.**~~

~~**a. The standard calculations contained in ASTM D 7158 assume Exposure Category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.**~~

S18-16 Part I Back

1504.7 Impact resistance.
Roof coverings installed on low-slope roofs (roof slope < 2:12) in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746-85(2015), ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470. All structural metal roofing systems having a thickness equal to or greater than 22 gage and all non-structural metal roof systems having a thickness equal to or greater than 26 gage shall be exempt from the tests listed above.

S21-16 Back

1504.8 Aggregate.
Aggregate ~~used as surfacing for roof coverings and aggregate, gravel or stone used as ballast~~

~~shall not be used on the roof of a building located in a hurricane-prone region as defined in Section 202, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the site~~ shall be permitted as roof surfacing when installed on slopes of 3:12 or less, not less than 400 pound (182 kg) of roofing gravel or 300 pounds (145 kg) of slag per square shall be applied. A minimum of 50 percent of the total aggregate shall be embedded in the flood coat of bitumen or installed in accordance with its product approval. Aggregate shall be dry and free from dirt and shall be in compliance with the sizing requirements set forth in ASTM D 1863. A building official may request a test to confirm compliance with these requirements.

S2-15 Back

1505.9 Photovoltaic panels and modules. ~~Rooftop mounted *photovoltaic panel systems* shall be tested, *listed* and identified with a fire classification in accordance with UL 1703. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.~~ **RESERVED**

S1-15 Back

1505.10 Roof gardens and landscaped roofs. ~~Roof gardens and landscaped roofs shall comply with Section 1507.16 and shall be installed in accordance with ANSI/SPRI VF-1.~~ **RESERVED**

S27-16 Back

1507.1.1 Underlayment. Unless otherwise noted, underlayment for asphalt shingles, metal roof panels, metal roof shingles, mineral surfaced roll roofing, slate shingles, wood shingles, and wood shakes shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D 226(2009), D 1970(2015a), D 4869(2016) and D 6757(2016) shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table 1507.1.1. Underlayment shall be applied and attached in accordance with Table 1507.1.1.

Exception:

A reinforced synthetic underlayment that is approved as an alternate to underlayment complying with ASTM D226 Type II and having a minimum tear strength per ASTM D1970(2015a) or ASTM D 4533(2015) of 20 lbs shall be permitted. This underlayment shall be installed and attached in accordance with the underlayment attachment methods of Table 1507.1.1 for the applicable roof covering and slope, except metal cap nails shall be required where the ultimate design wind speed, V_{ult}, equals or exceeds 150 mph.~~All seams shall be sealed with a compatible adhesive or compatible 4 inch wide tape.~~

TABLE 1507.1.1 UNDERLAYMENT TABLE

Roof Covering Section	**Roof Slope 2:12 and Less Than 4:12 Underlayment**	**Underlayment Attachment[a]**	**Roof Slope 4:12 and Greater Underlayment**	**Underlayment Attachment[a]**

Asphalt shingles **1507.2**	ASTM D 226 Type I or II ASTM D 4869 Type II, III or IV ASTM D 6757	**1**	ASTM D 226 Type II ASTM D 4869 Type IV ASTM D 6757	**2**
	ASTM D 1970	**3**	ASTM D 1970	**3**
Concrete and Clay Tile **1507.3**	**See Section 1507.3.3**			
Metal roof panels **1507.4**	ASTM D 226 Type I or II ASTM D 4869 Type II, III or IV ASTM D 6757	**1**	ASTM D 226 Type II ASTM D 4869 Type IV ASTM D 6757	**2**
	ASTM D 1970	**3**	ASTM D 1970	**3**
Metal roof shingles **roofing** **1507.5**	ASTM D 226 Type I or II ASTM D 4869 Type II, III or IV ASTM D 6757	**1**	ASTM D 226 Type II ASTM D 4869 Type IV ASTM D 6757	**2**
	ASTM D 1970	**3**	ASTM D 1970	**3**
Mineral-surfaced roll roofing **1507.6**	ASTM D 226 Type I or II ASTM D 4869 Type II, III or IV ASTM D 6757	**1**	ASTM D 226 Type II ASTM D 4869 Type IV ASTM D 6757	**2**
	ASTM D 1970	**3**	ASTM D 1970	**3**
Slate shingles **1507.7**	ASTM D 226 Type I or II ASTM D 4869 Type II, III or IV ASTM D 6757	**1**	ASTM D 226 Type II ASTM D 4869 Type IV ASTM D 6757	**2**
	ASTM D 1970	**3**	ASTM D 1970	**3**
Wood shingles **1507.8**	ASTM D 226 Type I or II ASTM D 4869 Type II, III or IV	**1**	ASTM D 226 Type II ASTM D 4869 Type IV	**2**
Wood shakes **1507.9**	-	Limited to roof slopes 4:12 and Greater	ASTM D 226 Type II ASTM D 4869 Type IV	**2**
Photovoltaic Shingles **1507.17**	ASTM D 226 Type I or II ASTM D 4869 Type II,	**1**	ASTM D 226 Type II ASTM D 4869 Type IV	**2**

	III or IV ASTM D 6757		ASTM D 6757	
	ASTM D 1970	**3**	ASTM D 1970	**3**

[a]Underlayment Attachment

1. **Roof slopes from two units vertical in 12 units horizontal (17-percent slope), and less than four units vertical in 12 units horizontal (33-percent slope).** Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), end laps shall be 4 6 inches and shall be offset by 6 feet. The underlayment shall be attached to a nailable deck with corrosion-resistant fasteners with one row centered in the field of the sheet with a maximum fastener spacing of 12 inches (305 mm) o.c., and one row at the end and side laps fastened 6 inches (152 mm) o.c. Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.
2. **Roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater.** Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 4 inches (51 mm), end laps shall be 4 6 inches and shall be offset by 6 feet. The underlayment shall be attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 inches (305 mm) o.c., and one row at the end and side laps fastened 6 inches (152 mm) o.c. Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.
3. **Roof slopes from two units vertical in 12 units horizontal (17-percent slope), and greater**. The entire roof deck shall be covered with an approved self-adhering polymer modified bitumen underlayment complying with ASTM D 1970(2015a) installed in accordance with both the underlayment manufacturer's and roof covering manufacturer's installation instructions for the deck material, roof ventilation configuration and climate exposure for the roof covering to be installed.

Exception: A minimum 4-inch-wide (102 mm) strip of self-adhering polymer-modified bitumen membrane complying with ASTM D 1970(2015a), installed in accordance with the manufacturer's instructions for the deck material, shall be applied over all joints in the roof decking. An approved underlayment in accordance with Table 1507.1.1 for the applicable roof covering shall be applied over

1507.2.3 Underlayment. ~~Unless otherwise noted, required underlayment shall conform to ASTM D 226, Type I, ASTM D 4869, Type I, or ASTM D 6757.~~ Underlayment shall comply and be installed in accordance with Section 1507.1.1.

1507.2.8 Underlayment application. ~~.~~ . Underlayment shall comply with Section 1507.1.1.

~~For roof slopes from two units vertical in 12 units horizontal (17-percent slope) and up to four~~

~~units vertical in 12 units horizontal (33-percent slope), underlayment shall be two layers applied in the following manner. Apply a minimum 19-inch-wide (483 mm) strip of underlayment felt parallel with and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment overlapping successive sheets 19 inches (483 mm), by fastened sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches (51 mm), fastened sufficiently to hold in place. Distortions in the underlayment shall not interfere with the ability of the shingles to seal.~~ **Reserved**

~~1507.2.8 Underlayment application.~~

~~Underlayment shall be installed using one of the following methods:~~

-

1. ~~For roof slopes from two units vertical in 12 units horizontal (17-percent slope), and less than four units vertical in 12 units horizontal (33-percent slope). Underlayment shall comply with ASTM D 226, Type I or Type II or ASTM D 4869, Type II or Type IV or ASTM D 6757 and shall be two layers applied in the following manner. Apply a 19-inch (483 mm) strip of underlayment felt parallel to and starting at the eaves, fastened sufficiently to hold in place. Starting at the eave, apply 36-inch-wide (914 mm) sheets of underlayment, overlapping successive sheets 19 inches (483 mm), and fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with one row in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). Synthetic underlayment shall be fastened in accordance with this section and the manufacturer's recommendations.~~

   -

2. ~~For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater. Underlayment shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV or ASTM D 6757 and shall be one layer applied in the following manner. Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 4 inches (51 mm), fastened with 1 inch (25 mm) round plastic cap, metal cap nails or nails and tin-tabs attached to a nailable deck with two staggered rows in the field of the sheet with a maximum fastener spacing of 12 in. o.c. (305 mm), and one row at the overlaps fastened 6 in. o.c. (152 mm). Synthetic underlayment shall be fastened in accordance with this section and the manufacturer's recommendations End laps shall be offset by 6 feet (1829 mm).~~

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3. **~~As an alternative, the entire roof deck shall be covered with an approved self-adhering polymer modified bitumen sheet meeting ASTM D 1970 or an approved self-adhering synthetic underlayment installed in accordance with the manufacturer's installation instructions.~~**

1507.2.8.1 High wind attachment.

~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~Exception:~~ ~~As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved**

1507.2.8.2 Ice barrier.

~~In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the *exterior wall* line of the building.~~

~~Exception:~~ ~~Detached accessory structures that contain no conditioned floor area.~~ **Reserved**

1507.3.3 Underlayment.

Unless otherwise noted, ~~required underlayment shall conform to: ASTM D 226, Type II; ASTM D 2626 or ASTM D 6380, Class M mineral-surfaced roll roofing.~~ underlayment shall be applied according to the underlayment manufacturer's installation instructions or the recommendations of the FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual, Fifth Edition where the basic wind speed, V_{asd}, is determined in accordance with Section 1609.3.1 or the recommendations of RAS 118, 119 or 120.

1507.3.3.1 ~~Low-slope roofs~~ Slope and underlayment requirements.

~~For roof slopes from $2^{1}/_{2}$ units vertical in 12 units horizontal (21-percent slope), up to four units vertical in 12 units horizontal (33-percent slope), underlayment shall be a minimum of two layers applied as follows:~~

~~1. Starting at the eave, a 19-inch (483 mm) strip of underlayment shall be applied parallel with the eave and fastened sufficiently in place.~~

~~2. Starting at the eave, 36-inch-wide (914 mm) strips of underlayment felt shall be applied overlapping successive sheets 19 inches (483 mm) and fastened sufficiently in place.~~ Refer to FRSA/TRI Florida High Wind Concrete and Clay Roof Tile Installation Manual, Fifth Edition (2012) where the basic wind speed, V_{asd}, is determined in accordance with Section 1609.3.1 for underlayment and slope requirements for specific roof tile systems or the recommendations of RAS 118, 119 or 120.

1507.3.3.2 High-slope roofs.
~~For roof slopes of four units vertical in 12 units horizontal (33-percent slope) or greater, underlayment shall be a minimum of one layer of underlayment felt applied shingle fashion, parallel to, and starting from the eaves and lapped 2 inches (51 mm), fastened only as necessary to hold in place.~~ Reserved.

1507.3.3.3 High wind attachment.
~~Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ Reserved.

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1507.2.4 Self-adhering polymer modified bitumen sheet. Self-adhering polymer modified bitumen sheet shall comply with ASTM D 1970(2015a).

1507.2.8.1 High wind attachment.
~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.~~
~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D~~

~~6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved**

1507.2.9.2 Valleys

Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least ~~24~~ 16 inches (~~610~~ 406 mm) wide and of any of the corrosion-resistant metals in Table 150~~7~~3.2~~.9. 2~~.

2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing complying with ASTM D 3909 or ASTM D 6380 Class M-03(2013) shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.

3. For closed valleys (valleys covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380 Class S-03(2013) , and at least 36 inches (914 mm) wide or types as described in Item 1 or 2 above shall be permitted. Self-adhering polymer modified bitumen underlayment complying with ASTM D 1970 shall be permitted in lieu of the lining material.

1507.3.9 Flashing.
At the juncture of the roof vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions ~~, and where of metal, shall not be less than 0.019 inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25-percent slope) and over, the valley flashing shall have a 36-inch-wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley, or a self-adhering polymer-modified bitumen sheet complying with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solid cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed~~ or the recommendations of the FRSA/TRI Florida High Wind Concrete and Clay Roof

Tile Installation Manual, Fifth Edition(2012) where the basic wind speed, V_{asd}, is determined in accordance with Section 1609.3.1 or the recommendation of RAS 118, 119 or 120.

1507.4.5 Underlayment and high wind. ~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.5.3.1 Underlayment and high wind.
~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.5.7 Flashing.
Roof valley flashing shall be of corrosion-resistant metal of the same material as the roof covering or shall comply with the standards in Table 1507.4.3(1). The valley flashing shall extend at least 8 inches (203 mm) from the centerline each way and shall have a splash diverter

rib not less than ~~$^3/_4$~~ 0.75 inch (19.1 mm) high at the flow line formed as part of the flashing. Sections of flashing shall have an end lap of not less than 4 inches (102 mm). ~~In areas where the average daily temperature in January is 25°F (-4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing shall have a 36-inch-wide (914 mm) underlayment directly under it consisting of either one layer of underlayment running the full length of the valley or a self-adhering polymer-modified bitumen sheet complying with ASTM D 1970, in addition to underlayment required for metal roof shingles. The metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for roof slopes under seven units vertical in 12 units horizontal (58-percent slope) or self-adhering polymer-modified bitumen sheet shall be installed.~~

1507.6.3.1 Underlayment and high wind.

~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.7.3.1 Underlayment and high wind.

~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.~~

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted. **Reserved.**

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosionresistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
RESERVED

1507.8.8 Flashing. At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall be not less than 0.019 inch

(0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flash ing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25 percent slope) and over, the valley flashing shall have a 36 inch wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley or a self adhering polymer modified bitumen sheet complying with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (4°C) or less or

where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing

underlayment shall be solidly cemented to the roofing underlayment for slopes under seven units vertical in 12

units horizontal (58 percent slope) or self adhering polymer modified bitumen sheet shall be installed.
RESERVED

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosionresistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of ¾ inch (19.1 mm) into the roof sheathing.

Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.
RESERVED

1507.9.9 Flashing. ~~At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided in accordance with the manufacturer's installation instructions, and where of metal, shall be not less than 0.019 inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion resistant metal. The valley flashing shall extend at least 11 inches (279 mm) from the centerline each way and have a splash diverter rib not less than 1 inch (25 mm) high at the flow line formed as part of the flashing. Sections of flash ing shall have an end lap of not less than 4 inches (102 mm). For roof slopes of three units vertical in 12 units horizontal (25 percent slope) and over, the valley flashing shall have a 36 inch wide (914 mm) underlayment of either one layer of Type I underlayment running the full length of the valley or a self adhering polymer modified bitumen sheet complying with ASTM D 1970, in addition to other required underlayment. In areas where the average daily temperature in January is 25°F (4°C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, the metal valley flashing underlayment shall be solidly cemented to the roofing underlayment for slopes under seven units vertical in 12 units horizontal (58 percent slope) or self adhering polymer modified bitumen sheet shall be installed.~~ **RESERVED**

1507.17.4.1 High wind attachment. ~~Underlayment applied in areas subject to high winds [Vasd greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied a long the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where Vasd is not less than 120 mph (54 m/s) shall comply with ASTM D 226, Type II, ASTM D 4869, Type IV or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **RESERVED**

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1507.2.8.1 High wind attachment.

~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120~~

~~mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved**

1507.3.3.3 High wind attachment.
~~Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ Reserved.

1507.4.5 Underlayment and high wind.~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.5.3.1 Underlayment and high wind.

~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.6.3.1 Underlayment and high wind.

~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^3/_4$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.7.3.1 Underlayment and high wind.

~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be~~

~~applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.8.3.1 Underlayment and high wind. ~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosionresistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~
RESERVED

1507.9.3.1 Underlayment and high wind. ~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosionresistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~
RESERVED

1507.9.4 Ice barrier. ~~In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering~~

~~polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.~~

~~**Exception:** Detached accessory structures that contain no conditioned floor area.~~ **RESERVED**

1507.17.4.1 High wind attachment. ~~Underlayment applied in areas subject to high winds [Vasd greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied a long the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where Vasd is not less than 120 mph (54 m/s) shall comply with ASTM D 226, Type II, ASTM D 4869, Type IV or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **RESERVED**

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1507.2.8.1 High wind attachment.
~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.~~
~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gauge [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gauge [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved**

1507.3.3.3 High wind attachment.
~~Underlayment applied in areas subject to high wind [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Sections 1507.3.3.1 and 1507.3.3.2 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ Reserved.

1507.4.5 Underlayment and high wind.~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.5.3.1 Underlayment and high wind.
~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.6.3.1 Underlayment and high wind.
~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12-gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of $^{3}/_{4}$ inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.7.3.1 Underlayment and high wind.
~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.~~

~~Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch spacing (152 mm) at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32-gage [0.0134 inch (0.34 mm)] sheet metal.~~

~~The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **Reserved.**

1507.8.3.1 Underlayment and high wind. ~~Underlayment applied in areas subject to high winds [V_{asd} greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosionresistant fasteners in accordance with the manufacturer's installation instructions. Fasteners are to be applied along the overlap not more than 36 inches (914 mm) on center. Underlayment installed where V_{asd}, in accordance with Section 1609.3.1, equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226, Type II or ASTM D 4869, Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with the manufacturer's installation instructions except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of at least 32 gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~**Exception:** As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~
RESERVED

1507.17.4.1 High wind attachment. ~~Underlayment applied in areas subject to high winds [Vasd greater than 110 mph (49 m/s) as determined in accordance with Section 1609.3.1] shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners shall be applied a long the overlap at not more than 36 inches (914 mm) on center. Underlayment installed where Vasd is not less than 120 mph (54 m/s) shall comply with ASTM D 226, Type II, ASTM D 4869, Type IV or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at the side laps. Underlayment shall be applied in accordance with Section 1507.2.8 except all laps shall be a minimum of 4 inches (102 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 inch (25 mm) with a thickness of not less than 32-gage [0.0134 inch (0.34 mm)] sheet metal. The cap nail shank shall be a minimum of 12 gage [0.105 inch (2.67 mm)] with a length to penetrate through the roof sheathing or a minimum of 3/4 inch (19.1 mm) into the roof sheathing.~~

~~Exception: As an alternative, adhered underlayment complying with ASTM D 1970 shall be permitted.~~ **RESERVED**

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1507.2.5 Asphalt shingles.
Asphalt shingles shall have self-seal strips or be interlocking and comply with ASTM D 225 or ASTM D 3462. Shingles shall also comply with Table 1507.2.7.1. Asphalt shingle packaging

shall bear labeling indicating compliance with one of the required classifications as shown in Table 1507.2.7.1.

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1507.8.9 Label required. Each bundle of shingles shall be identified by a *label* of an *approved* grading or inspection bureau or agency.

1507.9.10 Label required. Each bundle of shakes shall be identified by a *label* of an *approved* grading or inspection bureau or agency.

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1507.17.2 Deck slope. ~~Photovoltaic shingles shall not be installed on roof slopes less than three units vertical in 12 units horizontal (25-percent slope).~~ **RESERVED**

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1508.1.1 Cellulosic fiberboard. Cellulosic fiberboard roof insulation shall conform to the material and installation requirements of Chapter 23.

1508.2 Material standards. Above-deck thermal insulation board shall comply with the standards in Table 1508.2.

TABLE 1508.2 MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene	ASTM C 578
Fiber-reinforced gypsum board	ASTM C 1278
Glass-faced gypsum board	ASTM C 1177
Lightweight insulating concrete	ASTM C 495, C 513, C 796, C 869
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or II
Wood fiberboard	ASTM C 208

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TABLE 1508.2 MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene	ASTM C 578
Fiber-reinforced gypsum board	ASTM C 1278
Glass-faced gypsum board	ASTM C 1177
Lightweight insulating concrete	ASTM C 495, C 513, C 796, C 869
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or II
Wood fiberboard	ASTM C 208

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TABLE 1508.2 MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene	ASTM C 578
Fiber-reinforced gypsum board	ASTM C 1278
Glass-faced gypsum board	ASTM C 1177
Lightweight insulating concrete	ASTM C 495, C 513, C 796, C 869
Mineral fiber insulation board	ASTM C 726
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or II

Wood fiberboard	ASTM C 208

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1510.7.1 Wind resistance.
Rooftop-mounted photovoltaic ~~panels and modules~~ systems shall be designed for wind loads for component and cladding ~~wind loads~~ in accordance with Chapter 16 using an effective wind area based on the dimensions of a single unit frame.

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1511.3 ~~Roof~~ Recovering versus replacement.
~~*Roof replacement* shall include the removal of all existing layers of roof coverings down to the roof deck.~~

~~**Exception:** Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.~~
New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.

2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.

3. Where the existing roof has two or more applications of any type of roof covering

4. When blisters exist in any roofing, unless blisters are cut or scraped open and remaining materials secured down before applying additional roofing.

5. Where the existing roof is to be used for attachment for a new roof system and compliance with the securement provisions of Section 1504.1 cannot be met.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.

2. RESERVED

3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

1511.3.1 ~~Roof recover.~~

~~The installation of a new roof covering over an existing roof covering shall be permitted where any of the following conditions occur:~~

~~1. Where the new roof covering is installed in accordance with the roof covering manufacturer's approved instructions.~~

~~2. Complete and separate roofing systems, such as standing-seam metal roof panel systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.~~

~~3. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1511.4.~~

~~4. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear off of existing roof coverings.~~

~~1511.3.1.1 Exceptions.~~

~~A *roof recover* shall not be permitted where any of the following conditions occur:~~

~~1. Where the existing roof or roof covering is water-soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.~~

2. ~~Where the existing roof covering is slate, clay, cement or asbestos-cement tile.~~

~~3. Where the existing roof has two or more applications of any type of roof covering.~~

S56-16

1609.1.1 Determination of wind loads.
Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. ~~The type of opening protection required, the ultimate design wind speed, V_{ult}, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7.~~ Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions: (no change)

Exceptions:

1 - 4 No change

5. Designs using TIA-222 for antenna-supporting structures and antennas, provided the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment. Design using this standard shall be permitted for communication tower and steel antenna support structures.

6. No change.

7. Wind loads for screen enclosures shall be determined in accordance with Section 2002.4.

8. Exposed mechanical equipment or appliances fastened to a roof or installed on the ground in compliance with the code using rated stands, platforms, curbs, slabs, walls, or other means are deemed to comply with the wind resistance requirements of the 2007 Florida Building Code, as amended. Further support or enclosure of such mechanical equipment or appliances is not required by a state or local official having authority to enforce the Florida Building Code

1609.1.2.2. Application of ASTM E 1996. The text of Section 6.2.2 of ASTM E 1996 shall be substituted as follows:

6.2.2 Unless otherwise specified, select the wind zone based on the strength design wind speed, *Vult*, as follows:

6.2.2.1 *Wind Zone 1*—130 mph ≤ ultimate design wind speed, *Vult* < 140 mph.

6.2.2.2 *Wind Zone 2*—140 mph ≤ ultimate design wind speed, *Vult* < 150 mph at greater than one mile (1.6 km) from the coastline. The coastline shall be measured from the mean high water mark.

6.2.2.3 *Wind Zone 3*—150 mph (58 m/s) ≤ultimate design wind speed, *Vult* ≤ ~~160~~ 170 mph (63 m/s), or 140 mph (54 m/s) ≤ ultimate design wind speed, *Vult* ≤ ~~160~~ 170 mph (63 m/s) and within one mile (1.6 km) of the coastline. The coastline shall be measured from the mean high water mark.

6.2.2.4 *Wind Zone 4*— ultimate design wind speed, *Vult* > ~~160~~ 170 mph (6

Section 1609.3 Ultimate design wind speed. Revise to read as follows:

1609.3 Ultimate design wind speed. The ultimate design wind speed, V_{ult}, in mph, for the determination of the wind loads shall be determined by Figures 1609.3(1), 1609.3(2) and 1609.3(3). The ultimate design wind speed, V_{ult}, for use in the design of Risk Category II buildings and structures shall be obtained from Figure 1609.3(1). The ultimate design wind speed, V_{ult}, for use in the design of Risk Category III and IV buildings and structures shall be obtained from Figure 1609.3(2). The ultimate design wind speed, V_{ult}, for use in the design of Risk Category I buildings and structures shall be obtained from Figure 1609.3(3). The ultimate design wind speed, V_{ult}, for the special wind regions indicated near mountainous terrain and near gorges shall be in accordance with local jurisdiction requirements. The ultimate design wind speeds, V_{ult}, determined by the local jurisdiction shall be in accordance with Section 26.5.1 of ASCE 7. The exact location of wind speed lines shall be established by local ordinance using recognized physical landmarks such as major roads, canals, rivers and lake shores wherever possible.

No change to the remaining text

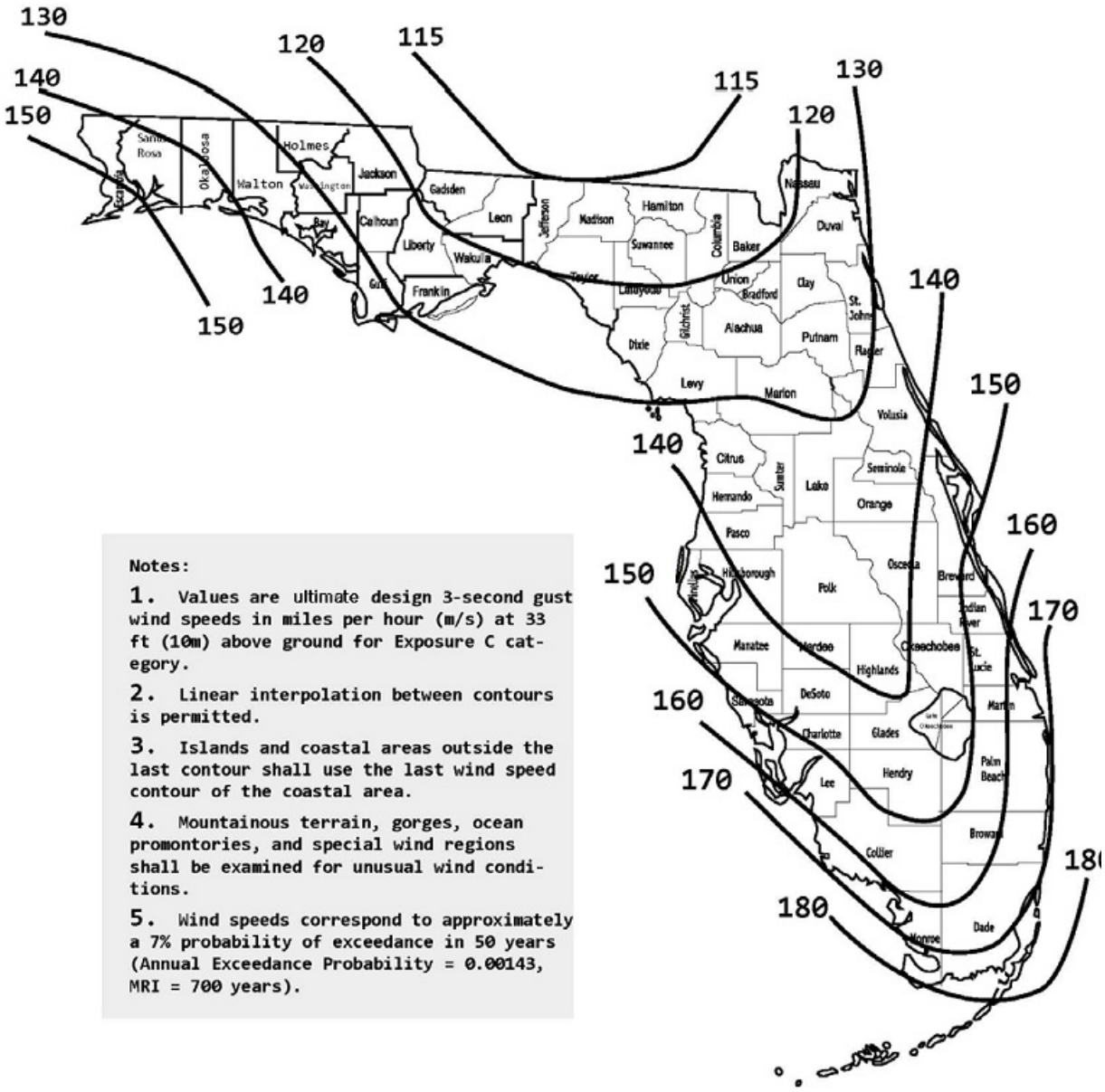

FIGURE 1609.3(1) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY II BUILDINGS AND OTHER

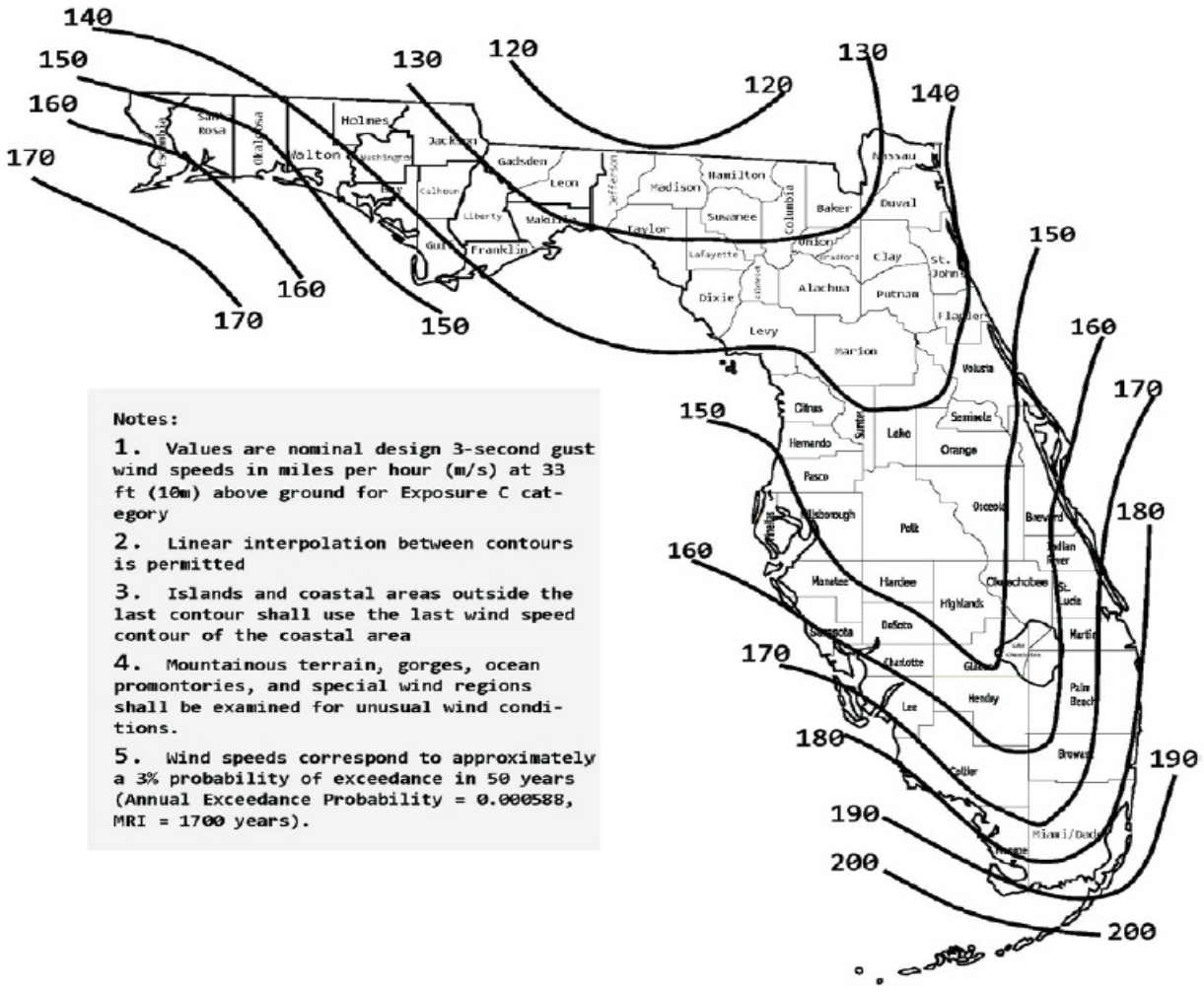

FIGURE 1609.3(2) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY III AND IV BUILDINGS AND OTHER STRUCTURES

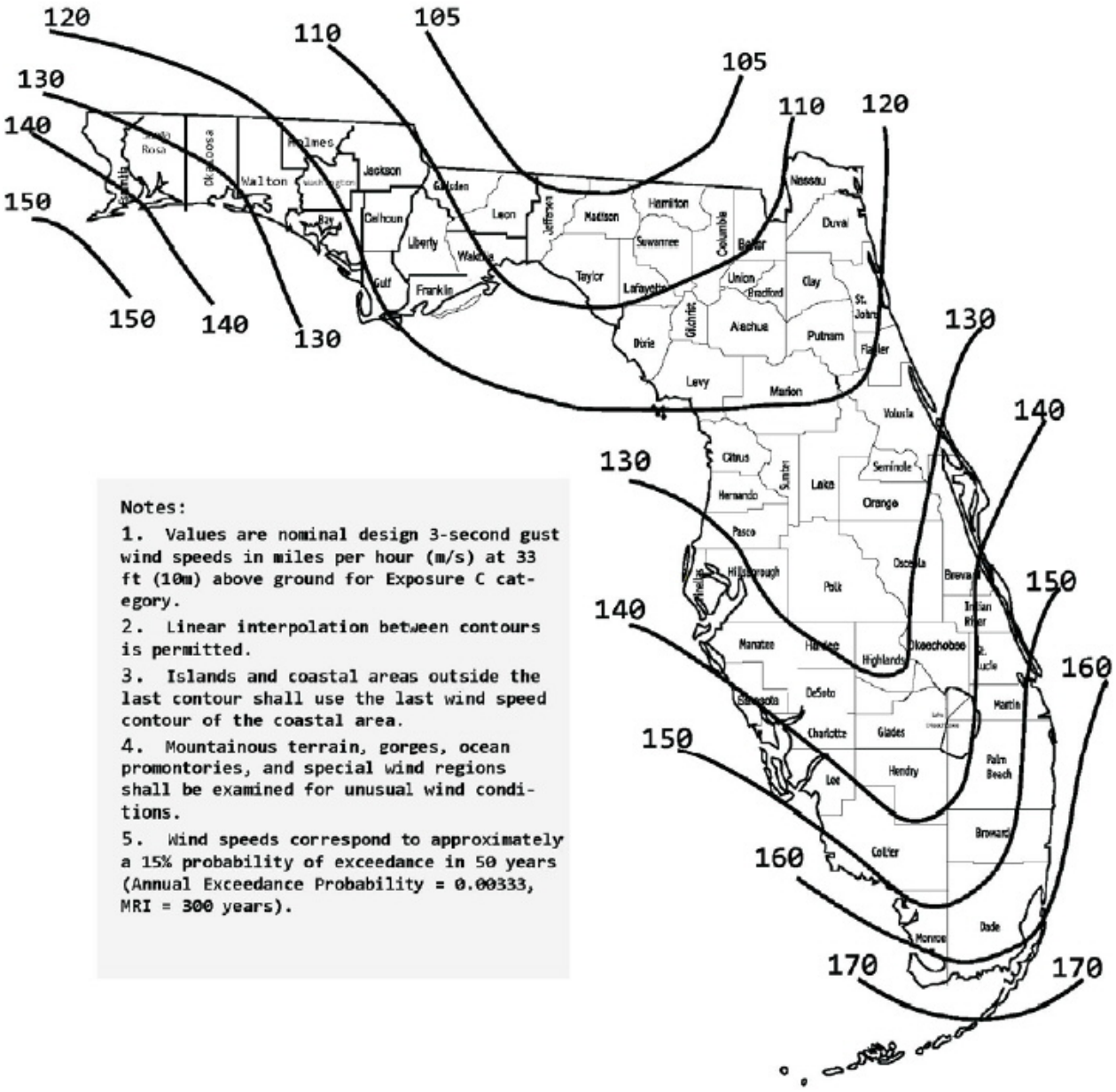

FIGURE 1609.3(3) ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR RISK CATEGORY I BUILDINGS AND OTHER STRUCTURES

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TABLE 1604.3
DEFLECTION LIMITS

CONSTRUCTION	*L*	*S* or *W f*	*D* + *L*d, g, j
Roof members:e Supporting plaster or stucco ceiling Supporting nonplaster ceiling Not supporting ceiling Members supporting screen surface	 //360 //240 //180 —	 //360 //240 //180 —	 //240 //180 //120 //60
Floor members	//360	—	//240
Exterior walls: With plaster or stucco finishes With other brittle finishes With flexible finishes	 — — —	 //360 //240 //120	 — — —
Interior partitions: [b] With plaster or stucco finishes With other brittle finishes With flexible finishes	 //360 //240 //120	 — — —	 — — —
Farm buildings	—	—	//180
Greenhouses	—	—	/ /120

For SI: 1 foot = 304.8 mm.

a. For structural roofing and siding made of formed metal sheets, the total load deflection shall not exceed *1*/60. For secondary roof structural members supporting formed metal roofing, the live load deflection shall not exceed *1*/150. For secondary wall members supporting formed metal siding, the design wind load deflection shall not exceed *1*/90. For roofs, this exception only applies when the metal sheets have no roof covering.

b. Flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in Section 1607.14.

c. See Section 2403 for glass supports.

d. The deflection limit for the *D*+*L* load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection. For wood structural members that are dry at time of installation and used under dry conditions in accordance with the AWC NDS, the creep component of the long-term deflection shall be permitted to be estimated as the immediate dead load deflection resulting from 0.5*D*. For wood structural members at all other moisture conditions, the creep component of the long-term deflection is permitted to be estimated as the immediate dead load deflection resulting from *D*. The value of 0.5*D* shall not be used in combination with AWC NDS provisions for long-term loading.

e. The above deflections do not ensure against ponding. Roofs that do not have sufficient slope or camber to ensure adequate drainage shall be investigated for ponding. See Section 1611 for rain and ponding requirements and Section 1503.4 for roof drainage requirements.

f. The wind load is permitted to be taken as 0.42 times the “component and cladding” loads for the purpose of determining deflection limits herein. Where members support glass in accordance with Section 2403 using the deflection limit therein, the wind load shall be no less than 0.6 times the “component and cladding” loads for the purpose of determining deflection.

g. For steel structural members, the dead load shall be taken as zero.

h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed *1*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *1*/175 for each glass lite or *1*/60 for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *1*/120.

i. For cantilever members, *1* shall be taken as twice the length of the cantilever.

j. Screen surfaces shall be permitted to include a maximum of 25% solid flexible finishes.

S64-16

TABLE 1604.3
DEFLECTION LIMITS

CONSTRUCTION	***L***	***S* or *W f***	***D* + *L*d, g, j**
Roof members:e			
Supporting plaster or stucco ceiling	//360	//360	//240
Supporting nonplaster ceiling	//240	//240	//180
Not supporting ceiling	//180	//180	//120
Members supporting screen surface	—	—	/60
Floor members	//360	—	//240
Exterior walls:			
With plaster or stucco finishes	—	//360	—
With other brittle finishes	—	//240	—
With flexible finishes	—	//120	—

Interior partitions: [b] With plaster or stucco finishes With other brittle finishes With flexible finishes	 //360 //240 //120	 — — —	 — — —
Farm buildings	—	—	//180
Greenhouses	—	—	/ /120

For SI: 1 foot = 304.8 mm.

a. For structural roofing and siding made of formed metal sheets, the total load deflection shall not exceed *1*/60. For secondary roof structural members supporting formed metal roofing, the live load deflection shall not exceed *1*/150. For secondary wall members supporting formed metal siding, the design wind load deflection shall not exceed *1*/90. For roofs, this exception only applies when the metal sheets have no roof covering.

b. Flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in Section 1607.14.

c. See Section 2403 for glass supports.

d. The deflection limit for the *D*+*L* load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection. For wood structural members that are dry at time of installation and used under dry conditions in accordance with the AWC NDS, the creep component of the long-term deflection shall be permitted to be estimated as the immediate dead load deflection resulting from 0.5*D*. For wood structural members at all other moisture conditions, the creep component of the long-term deflection is permitted to be estimated as the immediate dead load deflection resulting from *D*. The value of 0.5*D* shall not be used in combination with AWC NDS provisions for long-term loading.

e. The above deflections do not ensure against ponding. Roofs that do not have sufficient slope or camber to ensure adequate drainage shall be investigated for ponding. See Section 1611 for rain and ponding requirements and Section 1503.4 for roof drainage requirements.

f. The wind load is permitted to be taken as 0.42 times the “component and cladding” loads for the purpose of determining deflection limits herein. Where members support glass in accordance with Section 2403 using the deflection limit therein, the wind load shall be no less than 0.6 times the “component and cladding” loads for the purpose of determining deflection.

g. For steel structural members, the dead load shall be taken as zero.

h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed *1*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *1*/175 for each glass lite or *1*/60 for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *1*/120.

i. For cantilever members, *1* shall be taken as twice the length of the cantilever.

j. Screen surfaces shall be permitted to include a maximum of 25% solid flexible finishes.

S65-16

TABLE 1604.3
DEFLECTION LIMITS

CONSTRUCTION	***L***	***S* or *W f***	***D* + *L*d, g, j**
Roof members:e Supporting plaster or stucco ceiling Supporting nonplaster ceiling Not supporting ceiling Members supporting screen surface	//360 //240 //180 —	//360 //240 //180 —	//240 //180 //120 //60
Floor members	//360	—	//240
Exterior walls: With plaster or stucco finishes With other brittle finishes With flexible finishes	— — —	//360 //240 //120	— — —
Interior partitions: [b] With plaster or stucco finishes With other brittle finishes With flexible finishes	//360 //240 //120	— — —	— — —
Farm buildings	—	—	//180
Greenhouses	—	—	/ /120

For SI: 1 foot = 304.8 mm.

a. For structural roofing and siding made of formed metal sheets, the total load deflection shall not exceed *1*/60. For secondary roof structural members supporting formed metal roofing, the live load deflection shall not exceed *1*/150. For secondary wall members supporting formed metal siding, the design wind load deflection shall not

exceed *1*/90. For roofs, this exception only applies when the metal sheets have no roof covering.

b. Flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in Section 1607.14.

c. See Section 2403 for glass supports.

d. The deflection limit for the *D*+*L* load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection. For wood structural members that are dry at time of installation and used under dry conditions in accordance with the AWC NDS, the creep component of the long-term deflection shall be permitted to be estimated as the immediate dead load deflection resulting from 0.5*D*. For wood structural members at all other moisture conditions, the creep component of the long-term deflection is permitted to be estimated as the immediate dead load deflection resulting from *D*. The value of 0.5*D* shall not be used in combination with AWC NDS provisions for long-term loading.

e. The above deflections do not ensure against ponding. Roofs that do not have sufficient slope or camber to ensure adequate drainage shall be investigated for ponding. See Section 1611 for rain and ponding requirements and Section 1503.4 for roof drainage requirements.

f. The wind load is permitted to be taken as 0.42 times the “component and cladding” loads for the purpose of determining deflection limits herein. Where members support glass in accordance with Section 2403 using the deflection limit therein, the wind load shall be no less than 0.6 times the “component and cladding” loads for the purpose of determining deflection.

g. For steel structural members, the dead load shall be taken as zero.

h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed *1*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *1*/175 for each glass lite or *1*/60 for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *1*/120.

i. For cantilever members, *1* shall be taken as twice the length of the cantilever.

<u>j. Screen surfaces shall be permitted to include a maximum of 25% solid flexible finishes.</u>

S66-16

TABLE 1604.3
DEFLECTION LIMITS

CONSTRUCTION	*L*	*S* or *W f*	*D* + *L*d, g, j
Roof members:e			
Supporting plaster or stucco ceiling	//360	//360	//240
Supporting nonplaster ceiling	//240	//240	//180
Not supporting ceiling	//180	//180	//120
Members supporting screen surface	—	—	//60
Floor members	//360	—	//240
Exterior walls:			
With plaster or stucco finishes	—	//360	—
With other brittle finishes	—	//240	—
With flexible finishes	—	//120	—
Interior partitions: [b]			
With plaster or stucco finishes	//360	—	—
With other brittle finishes	//240	—	—
With flexible finishes	//120	—	—
Farm buildings	—	—	//180
Greenhouses	—	—	/ /120

For SI: 1 foot = 304.8 mm.

a. For structural roofing and siding made of formed metal sheets, the total load deflection shall not exceed *1*/60. For secondary roof structural members supporting formed metal roofing, the live load deflection shall not exceed *1*/150. For secondary wall members supporting formed metal siding, the design wind load deflection shall not exceed *1*/90. For roofs, this exception only applies when the metal sheets have no roof covering.

b. Flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in Section 1607.14.

c. See Section 2403 for glass supports.

d. The deflection limit for the *D*+*L* load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection. For wood structural members that are dry at time of installation and used under dry conditions in accordance with the AWC NDS, the creep component of the long-term deflection shall be permitted to be estimated as the immediate dead load deflection resulting from 0.5*D*. For wood structural members at all other moisture

conditions, the creep component of the long-term deflection is permitted to be estimated as the immediate dead load deflection resulting from *D*. The value of 0.5*D* shall not be used in combination with AWC NDS provisions for long-term loading.

e. The above deflections do not ensure against ponding. Roofs that do not have sufficient slope or camber to ensure adequate drainage shall be investigated for ponding. See Section 1611 for rain and ponding requirements and Section 1503.4 for roof drainage requirements.

f. The wind load is permitted to be taken as 0.42 times the “component and cladding” loads for the purpose of determining deflection limits herein. Where members support glass in accordance with Section 2403 using the deflection limit therein, the wind load shall be no less than 0.6 times the “component and cladding” loads for the purpose of determining deflection.

g. For steel structural members, the dead load shall be taken as zero.

h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed *1*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *1*/175 for each glass lite or *1*/60 for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *1*/120.

i. For cantilever members, *1* shall be taken as twice the length of the cantilever.

j. Screen surfaces shall be permitted to include a maximum of 25% solid flexible finishes.

S67-16

TABLE 1604.3
DEFLECTION LIMITS

CONSTRUCTION	***L***	***S* or *W f***	***D* + *L*d, g, j**
Roof members:e			
Supporting plaster or stucco ceiling	*l*/360	*l*/360	*l*/240
Supporting nonplaster ceiling	*l*/240	*l*/240	*l*/180
Not supporting ceiling	*l*/180	*l*/180	*l*/120
Members supporting screen surface	—	—	*l*/60
Floor members	*l*/360	—	*l*/240

Exterior walls: With plaster or stucco finishes With other brittle finishes With flexible finishes	— — —	//360 //240 //120	— — —
Interior partitions: [b] With plaster or stucco finishes With other brittle finishes With flexible finishes	//360 //240 //120	— — —	— — —
Farm buildings	—	—	//180
Greenhouses	—	—	/ /120

For SI: 1 foot = 304.8 mm.

a. For structural roofing and siding made of formed metal sheets, the total load deflection shall not exceed *1*/60. For secondary roof structural members supporting formed metal roofing, the live load deflection shall not exceed *1*/150. For secondary wall members supporting formed metal siding, the design wind load deflection shall not exceed *1*/90. For roofs, this exception only applies when the metal sheets have no roof covering.

b. Flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in Section 1607.14.

c. See Section 2403 for glass supports.

d. The deflection limit for the *D*+*L* load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection. For wood structural members that are dry at time of installation and used under dry conditions in accordance with the AWC NDS, the creep component of the long-term deflection shall be permitted to be estimated as the immediate dead load deflection resulting from 0.5*D*. For wood structural members at all other moisture conditions, the creep component of the long-term deflection is permitted to be estimated as the immediate dead load deflection resulting from *D*. The value of 0.5*D* shall not be used in combination with AWC NDS provisions for long-term loading.

e. The above deflections do not ensure against ponding. Roofs that do not have sufficient slope or camber to ensure adequate drainage shall be investigated for ponding. See Section 1611 for rain and ponding requirements and Section 1503.4 for roof drainage requirements.

f. The wind load is permitted to be taken as 0.42 times the “component and cladding” loads for the purpose of determining deflection limits herein. Where members support glass in accordance with Section 2403 using the deflection limit therein, the wind load

shall be no less than 0.6 times the “component and cladding” loads for the purpose of determining deflection.

g. For steel structural members, the dead load shall be taken as zero.

h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed *1*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *1*/175 for each glass lite or *1*/60 for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *1*/120.

i. For cantilever members, *1* shall be taken as twice the length of the cantilever.

j. Screen surfaces shall be permitted to include a maximum of 25% solid flexible finishes.

S69-16

TABLE 1604.3
DEFLECTION LIMITS

CONSTRUCTION	***L***	***S* or *W f***	***D* + *L*d, g, j**
Roof members:e Supporting plaster or stucco ceiling Supporting nonplaster ceiling Not supporting ceiling Members supporting screen surface	 //360 //240 //180 —	 //360 //240 //180 —	 //240 //180 //120 //60
Floor members	//360	—	//240
Exterior walls: With plaster or stucco finishes With other brittle finishes With flexible finishes	 — — —	 //360 //240 //120	 — — —
Interior partitions: [b] With plaster or stucco finishes With other brittle finishes With flexible finishes	 //360 //240 //120	 — — —	 — — —
Farm buildings	—	—	//180
Greenhouses	—	—	/ /120

For SI: 1 foot = 304.8 mm.

a. For structural roofing and siding made of formed metal sheets, the total load deflection shall not exceed *1*/60. For secondary roof structural members supporting formed metal roofing, the live load deflection shall not exceed *1*/150. For secondary wall members supporting formed metal siding, the design wind load deflection shall not exceed *1*/90. For roofs, this exception only applies when the metal sheets have no roof covering.

b. Flexible, folding and portable partitions are not governed by the provisions of this section. The deflection criterion for interior partitions is based on the horizontal load defined in Section 1607.14.

c. See Section 2403 for glass supports.

d. The deflection limit for the *D*+*L* load combination only applies to the deflection due to the creep component of long-term dead load deflection plus the short-term live load deflection. For wood structural members that are dry at time of installation and used under dry conditions in accordance with the AWC NDS, the creep component of the long-term deflection shall be permitted to be estimated as the immediate dead load deflection resulting from 0.5*D*. For wood structural members at all other moisture conditions, the creep component of the long-term deflection is permitted to be estimated as the immediate dead load deflection resulting from *D*. The value of 0.5*D* shall not be used in combination with AWC NDS provisions for long-term loading.

e. The above deflections do not ensure against ponding. Roofs that do not have sufficient slope or camber to ensure adequate drainage shall be investigated for ponding. See Section 1611 for rain and ponding requirements and Section 1503.4 for roof drainage requirements.

f. The wind load is permitted to be taken as 0.42 times the “component and cladding” loads for the purpose of determining deflection limits herein. Where members support glass in accordance with Section 2403 using the deflection limit therein, the wind load shall be no less than 0.6 times the “component and cladding” loads for the purpose of determining deflection.

g. For steel structural members, the dead load shall be taken as zero.

h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed *1*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *1*/175 for each glass lite or *1*/60 for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *1*/120.

i. For cantilever members, *1* shall be taken as twice the length of the cantilever.

j. Screen surfaces shall be permitted to include a maximum of 25% solid flexible finishes.

S75-16

TABLE 1604.5
RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities. • Screen enclosures.
II	Buildings and other structures except those listed in Risk Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing Group E occupancies with an occupant load greater than 250. • Buildings and other structures containing educational occupancies for students above he 12th grade with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident care recipients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000a. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not

	included in Risk Category IV. • Buildings and other structures not included in Risk Category IV containing quantities of toxic or explosive materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the ~~*International*~~ *Florida Fire Prevention Code*; and Are sufficient to pose a threat to the public if releasedb.
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Group I-2 occupancies having surgery or emergency treatment facilities. • Fire, rescue, ambulance and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Risk Category IV structures. • Buildings and other structures containing quantities of highly toxic materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(2) or per outdoor control area in accordance with the ~~*International*~~ *Florida Fire Prevention Code*; and Are sufficient to pose a threat to the public if releasedb. • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

a. For purposes of occupant load calculation, occupancies required by Table 1004.1.2 to use gross floor area calculations shall be permitted to use net floor areas to determine the total occupant load.

b. Where approved by the building official, the classification of buildings and other structures as Risk Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Risk Category II, provided it can be demonstrated by a hazard assessment in accordance with Section 1.5.3 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

S104-16

1609.1.1 Determination of wind loads.
Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. ~~The type of opening protection required, the ultimate design wind speed, V_{ult}, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7.~~ Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions: (no change)

Exceptions:

1 - 4 No change

5. Designs using TIA-222 for antenna-supporting structures and antennas, provided the horizontal extent of Topographic Category 2 escarpments in Section 2.6.6.2 of TIA-222 shall be 16 times the height of the escarpment. Design using this standard shall be permitted for communication tower and steel antenna support structures.

6. No change.

7. Wind loads for screen enclosures shall be determined in accordance with Section 2002.4.

8. Exposed mechanical equipment or appliances fastened to a roof or installed on the ground in compliance with the code using rated stands, platforms, curbs, slabs, walls, or other means are deemed to comply with the wind resistance requirements of the 2007 Florida Building Code, as amended. Further support or enclosure of such mechanical equipment or appliances is not required by a state or local official having authority to enforce the Florida Building Code.

S150-16

1709.5 Exterior window and door assemblies.
The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section 1709.5.1 or 1709.5.2. For the purposes of this section, the required design pressure shall be determined using the allowable stress design load combinations of Section 1605.3.

Exception: Custom doors. Custom (one-of-a-kind) exterior door assemblies shall be tested by an approved testing laboratory or be designed and engineered in accordance with accepted engineering practices by a Florida Registered Design Professional. Signed and sealed copies of the rational analysis and calculations shall be provided to the building official upon permit application.