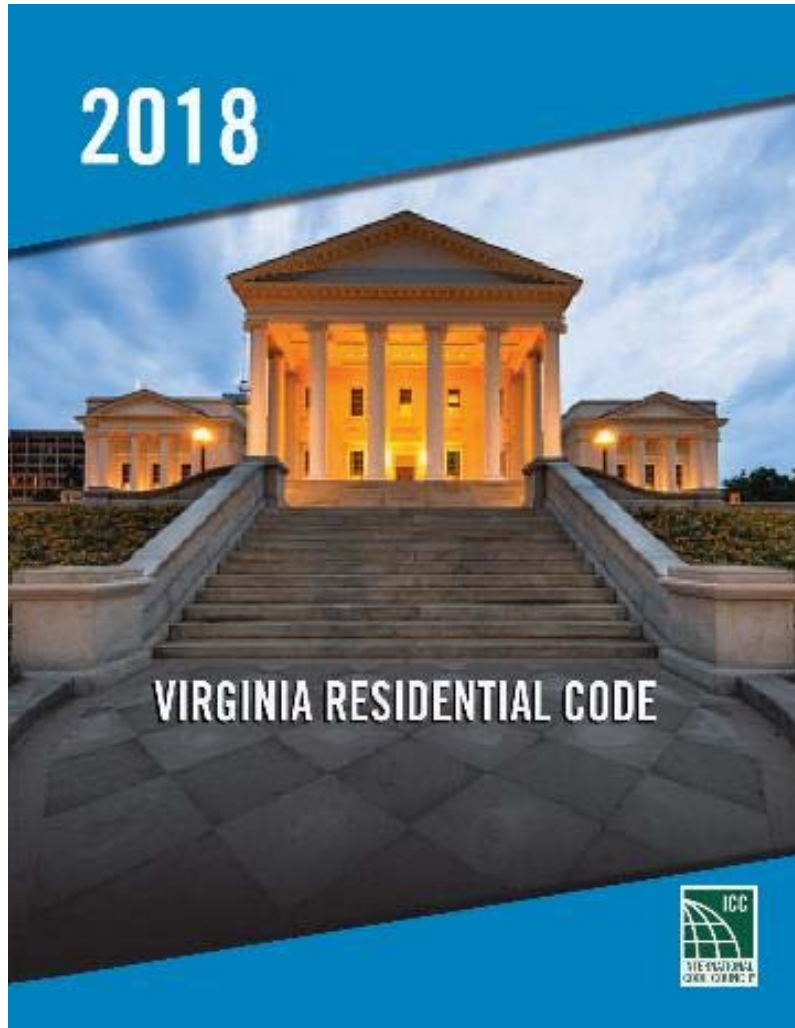


2018 Code Change Training

2018 Virginia Residential Code (VRC)

Significant International Changes and
State Amendments

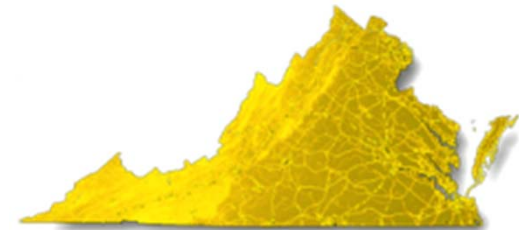




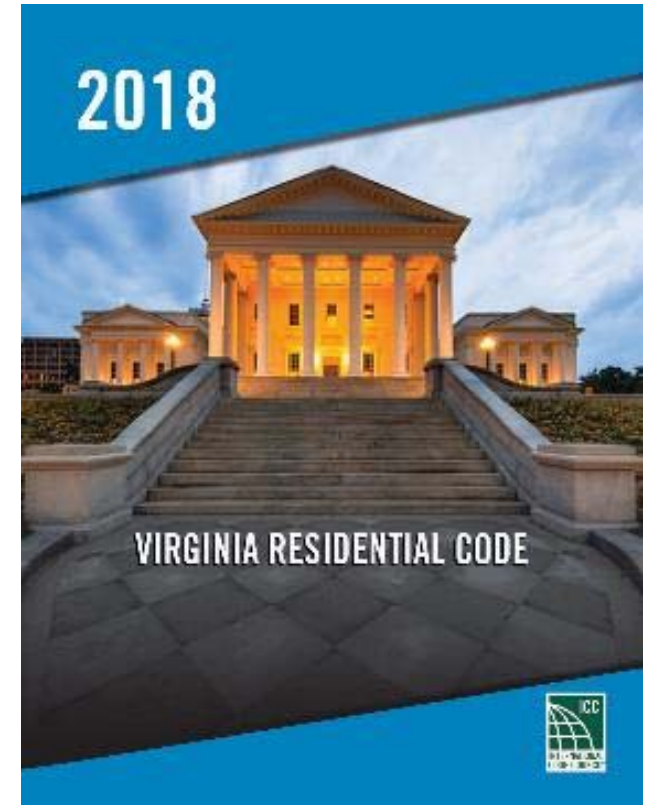
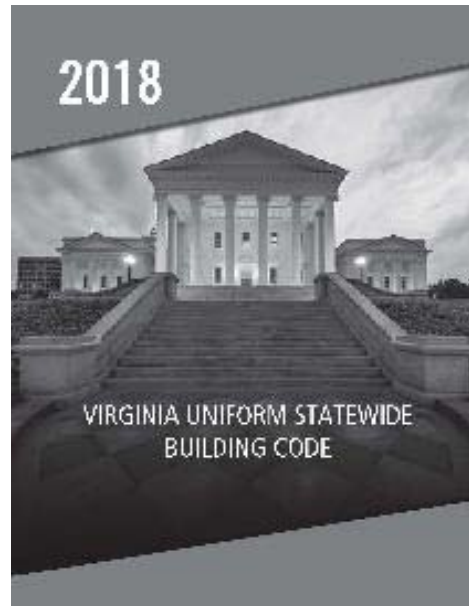
Agenda

Significant 2018 Residential Code Changes

- International Residential Code (IRC) changes and Virginia amendments in chapter order
- VA icon indicates VA amendments



Virginia USBC and the IRC



There are 4 Types of Code Changes

Addition

- A new code section or sections are added

Deletion

- A code section is either deleted completely, or deleted because it was moved to another code section

Modification

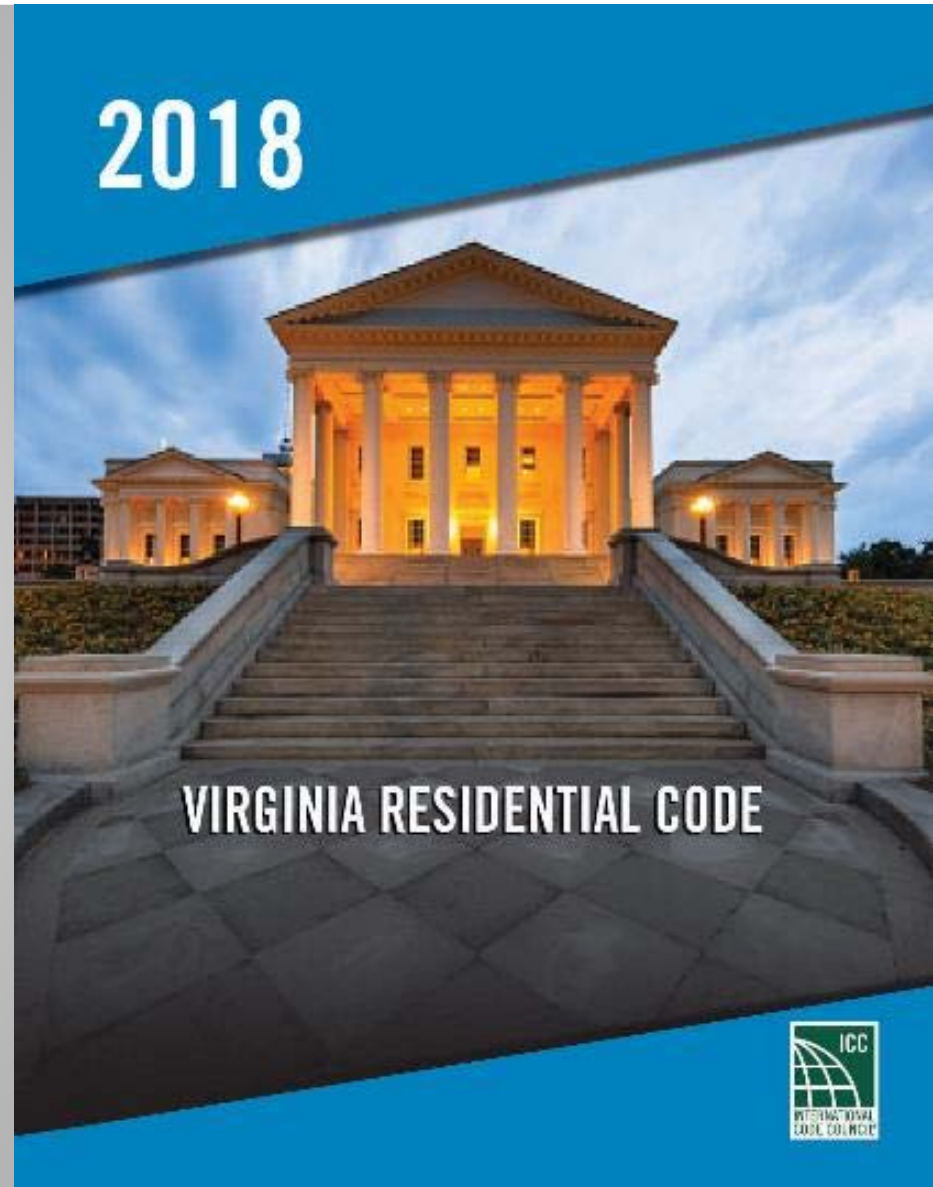
- A code section is changed to include new or different requirements or exceptions (most common)

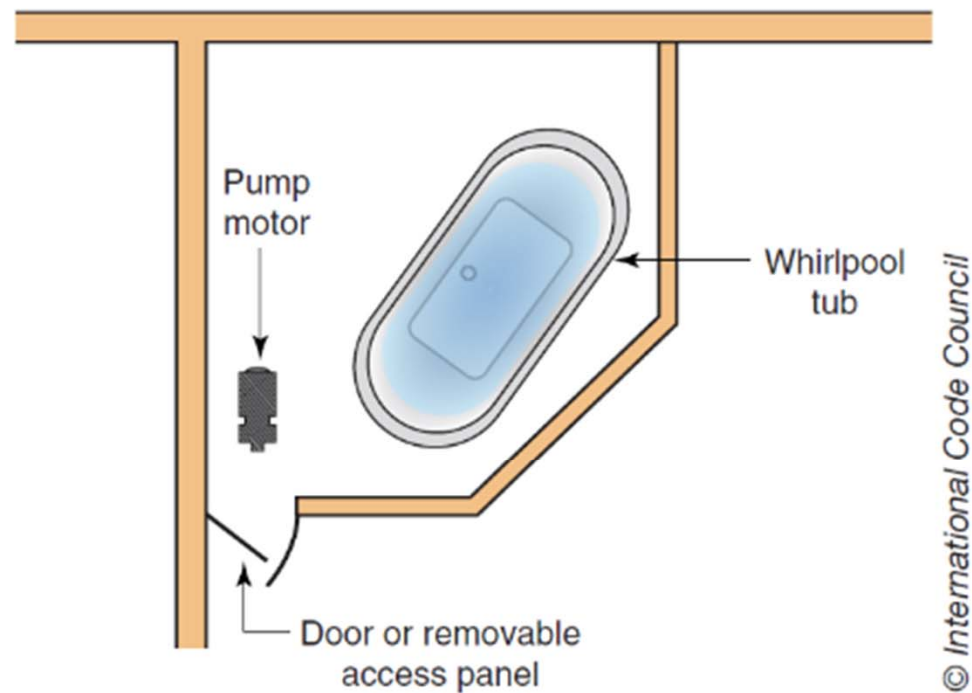
Clarification

- A code section has changed to clarify existing requirements

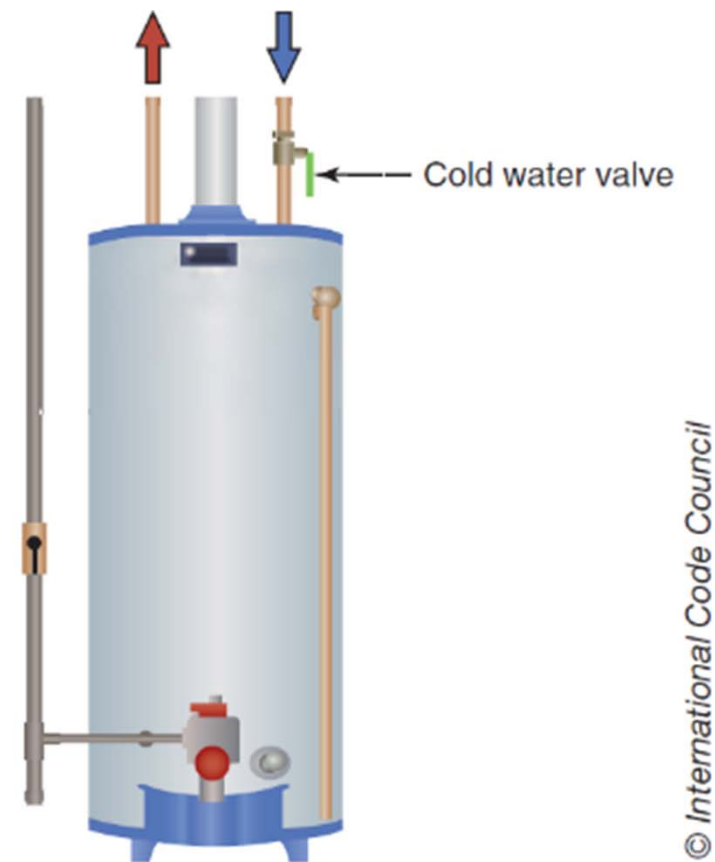
Chapter 2

Definitions





Access to whirlpool pump



Ready access to cold water valve of water heater

New Definition for “Access” and “Ready Access”

- Helps eliminate confusion with the term “accessible”



New Definition for “Crawl Space”

- “An underfloor space that is not a basement.”

New Definitions Differentiate a Carbon Monoxide **Alarm** from a **Detector**

- **Alarm:** Sensor, controls, and audible alarm **in one unit**
- **Detector:** Sensor **sends alarm signal** to a connected alarm control unit



Definition of Fenestration - Clarification

- Modified to encompass a new definition for vertical fenestration and the modified definition for skylights and sloped glazing.



3 new solar related definitions are added

SOLAR ENERGY SYSTEM

- A system that converts solar radiation to usable energy, including **photovoltaic panel systems AND solar thermal systems**.

SOLAR THERMAL COLLECTOR

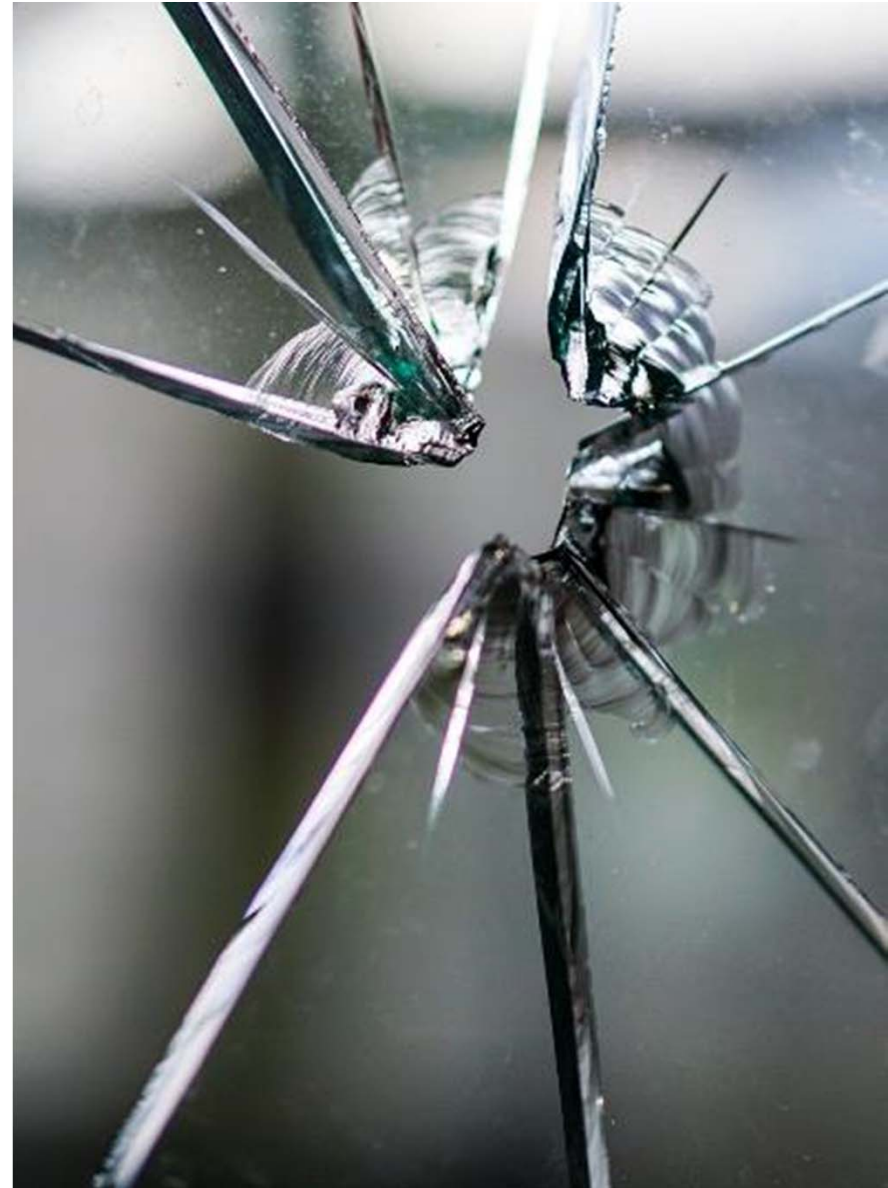
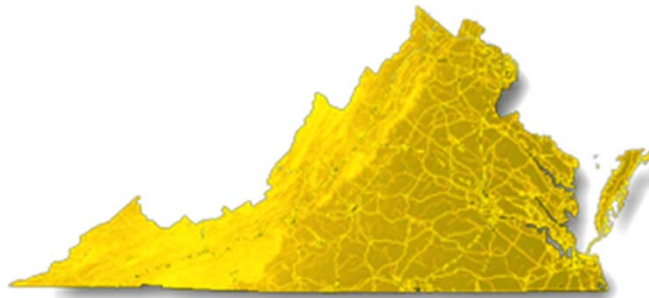
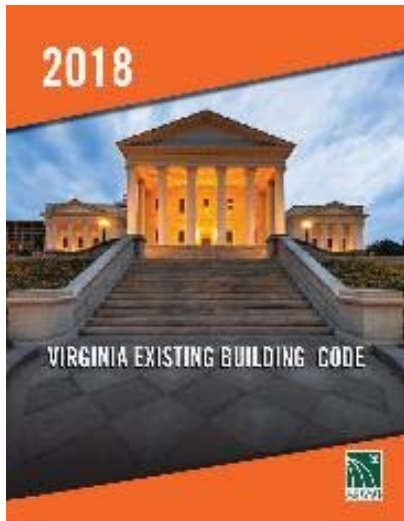
- Components in a **solar thermal system** that collect and convert solar radiation to thermal energy.

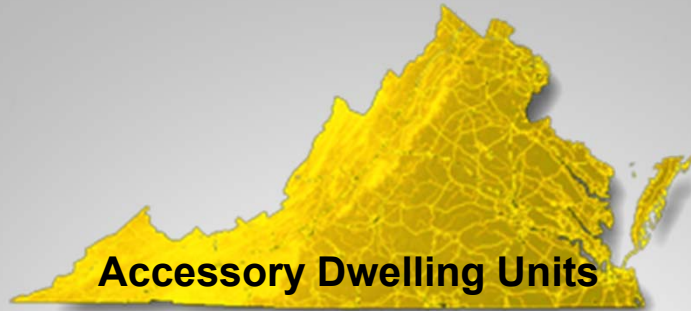
SOLAR THERMAL SYSTEM

- A system that converts solar radiation to **thermal energy** for use in heating or cooling.

New Definitions for “Substantial Damage” and “Substantial Improvement”

- Aligns with updated VEBC definitions.



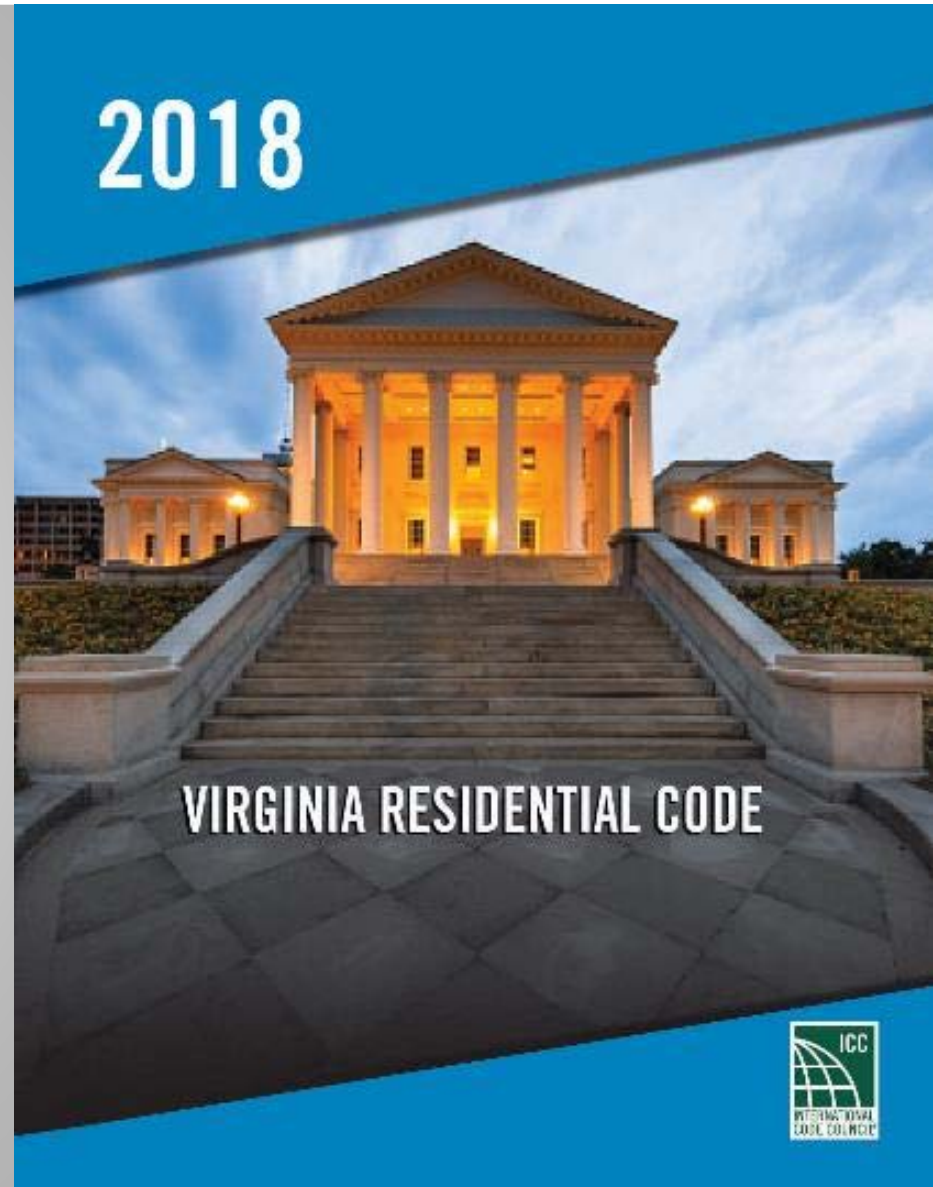


Accessory Dwelling Units

Special Section

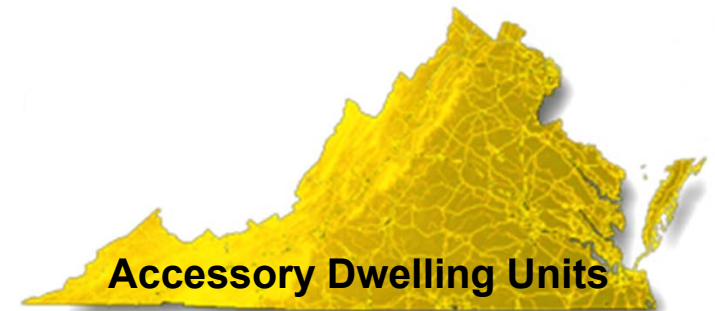
Residential Uses Subgroup Proposal for Accessory Dwelling Units (ADUs)

Proposal [RB302.3(2)-18]

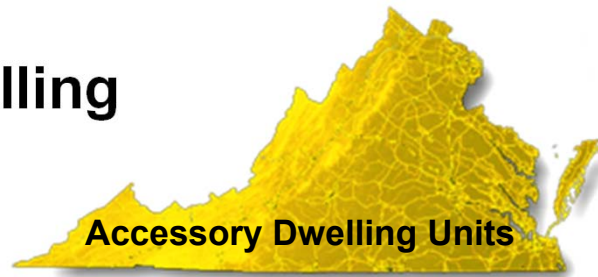


8 Related ADU Changes – Covered Together

- New or modified definitions for “Accessory Dwelling Unit”, “Two-Family Dwelling”, and “Dwelling”
- R302.3 Two-family dwellings – Modified (New Ex. #3)
- R311.1 Means of egress - Modified
- R314.7 Fire alarm systems - Modified
- R315.5 Interconnectivity - Modified
- M1602.2 Return Air Openings - Modified



New Definition – “Accessory Dwelling Unit”



- A unit in a two-family dwelling that is accessory to the primary *dwelling*
- Separate living, sleeping, eating, cooking, and sanitation facilities
- May share living space, **means of egress**, utilities...



There are many types of ADUs, with the 4 most common configurations shown here



ATTACHED

Shares at least one wall with the primary home



INTERIOR CONVERSION

Built from existing converted space (e.g., an attic or a basement)



ABOVE GARAGE

Unit built above garage

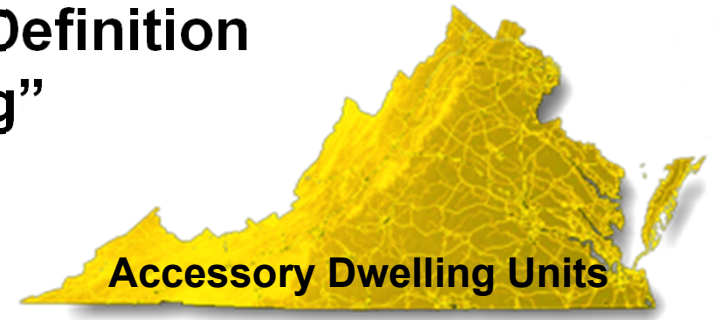


GARAGE APARTMENT

Converted former garage space

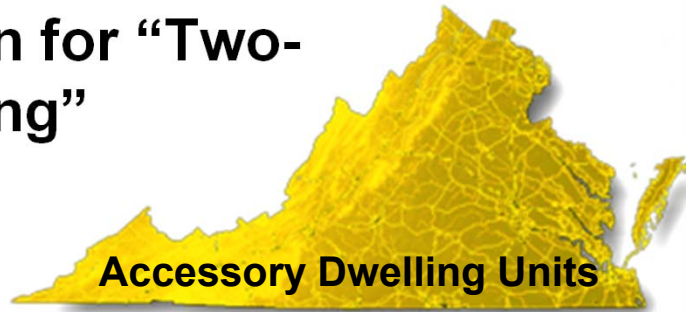


Change to Definition of “Dwelling”



“Any building that contains one or two dwelling units, or one dwelling unit and one accessory dwelling unit, used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.”

New Definition for “Two-Family Dwelling”



- "A dwelling that includes **two dwelling units**
- OR**
- one dwelling unit and one *accessory dwelling unit*."

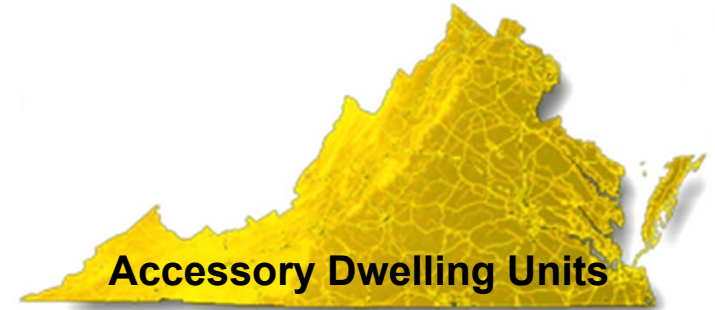


R311.1 – Means of Egress

Section modified to align with the new definitions

“Dwellings, and each dwelling unit in a two-family dwelling, shall be provided with a means of egress in accordance with this section.”

- Accessory dwelling units **may share means of egress** with the primary dwelling unit.



R302.3 – New Exception #3

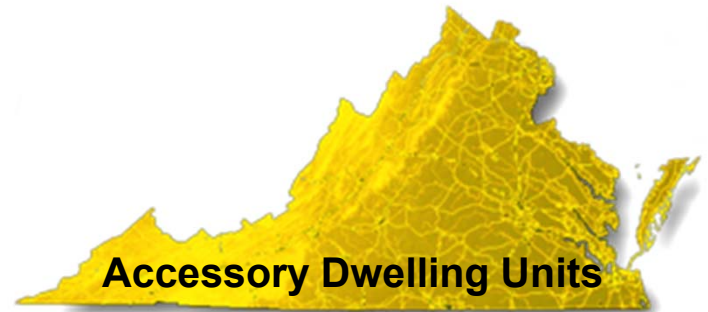


New exception for Accessory Dwelling Unit and Dwelling Unit Fire Separation

To meet exception, units must

- Be on same lot **AND**
- Comply with **314.7 (Fire Alarm Systems) AND**
- Comply with **R315.5 (Interconnection of CO alarms)**

R314.7 – Fire Alarm Systems

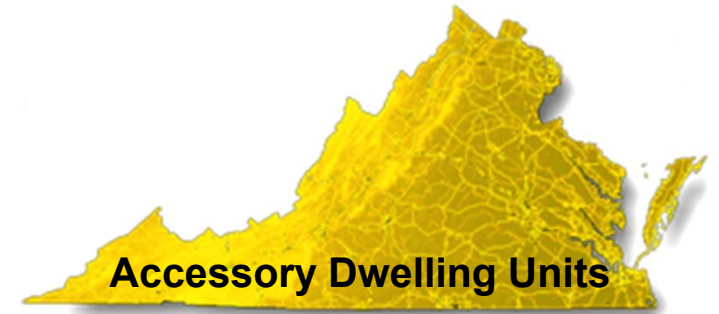


For Two-Family Dwellings without Fire Separation Constructed per Exception #3 of R302.3

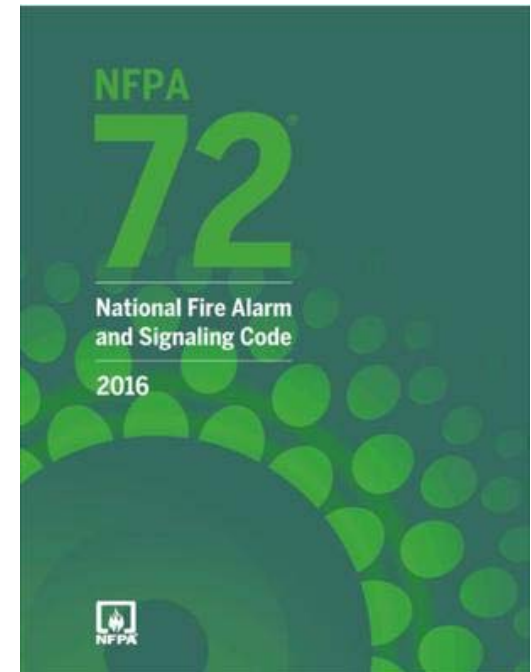
- Requires a **fire alarm system** complying with **sections R314.7.1 through R314.7.4**
- **R314.7.1 – General.** Fire alarm systems shall comply with the provisions of this code and the household fire warning *equipment* provisions of NFPA 72....



Fire Alarm Systems



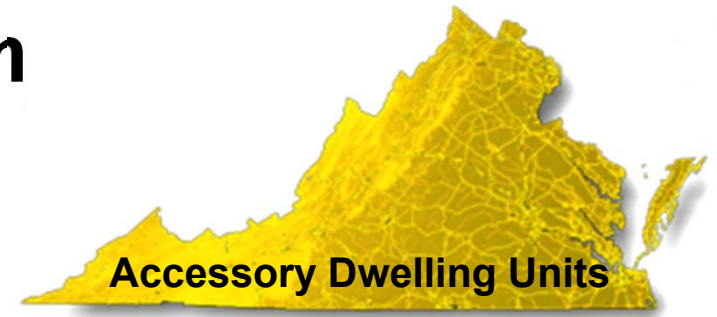
To learn more, review the household fire warning *equipment* provisions of **NFPA 72-16**.



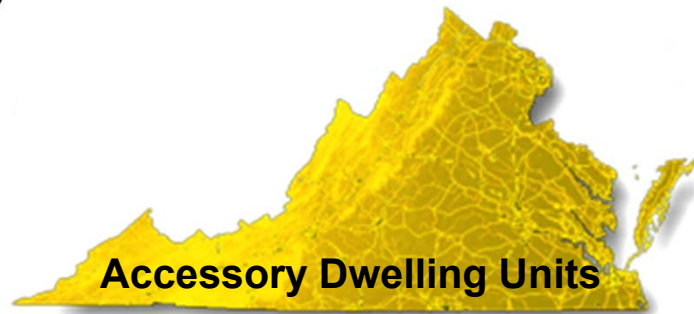
R315.5 - Carbon Monoxide Alarm Interconnectivity

For Two-Family Dwellings without Fire Separation Constructed per Exception #3 of R302.3

- If CO alarms are required, they must be interconnected such that one alarm activates all alarms in **both dwelling units.**



M1602.2 - Exception to item 7

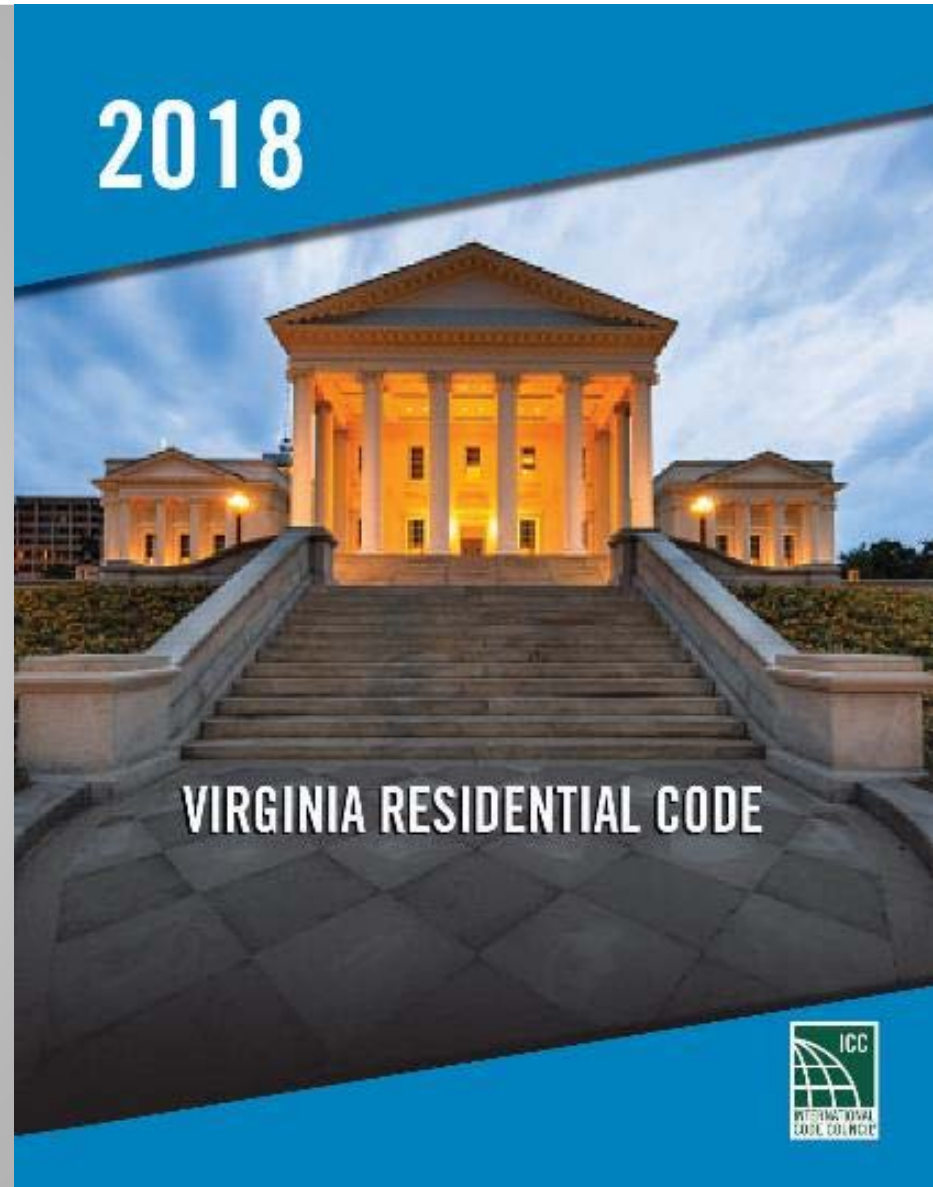


- **Exception:** “The return air within a two-family dwelling constructed without fire separations in accordance with Exception 3 of Section R302.3 shall be **permitted to discharge into either dwelling unit.**”



What questions do
you have?

Skill Check 1



Other Significant
Chapter 3 Changes

Building Planning and Construction

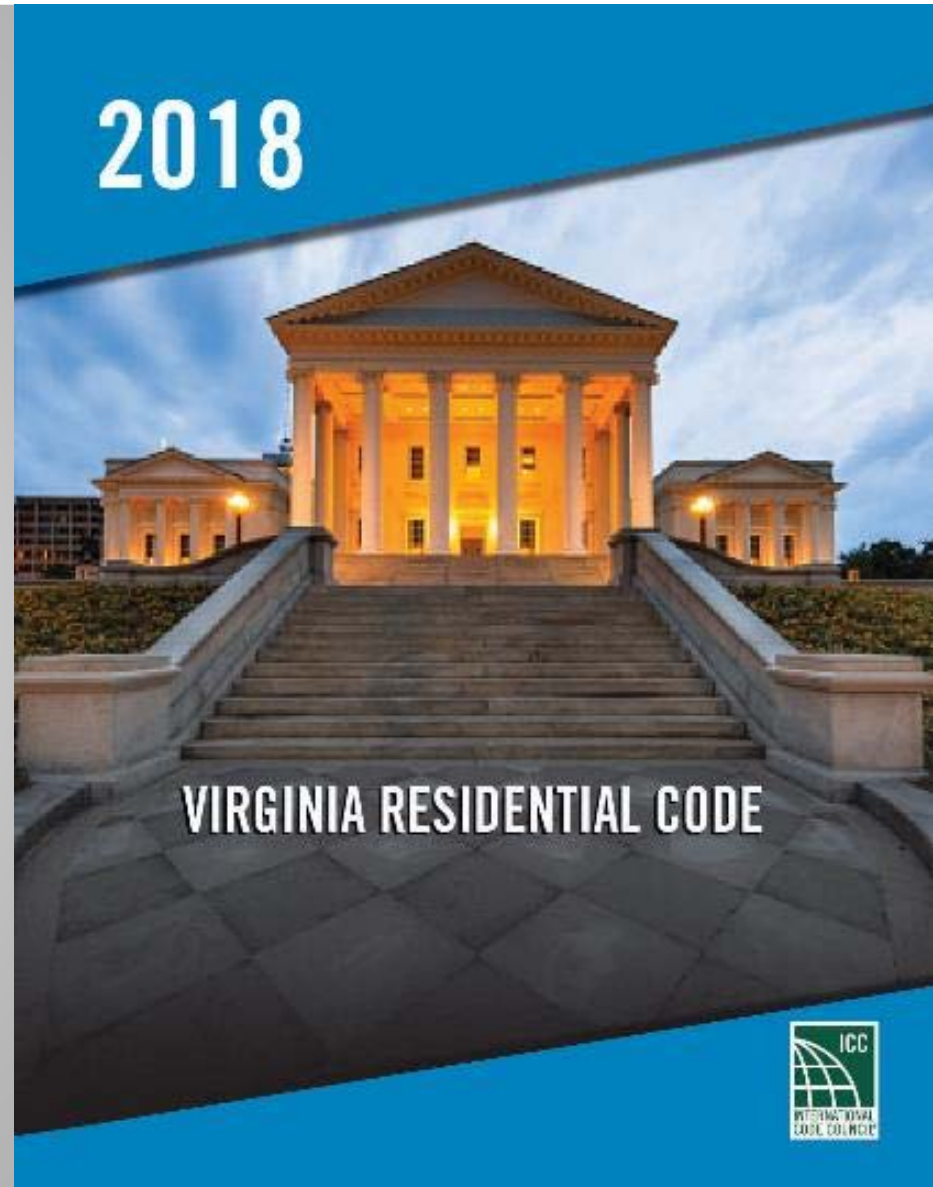


Table R301.2(1)

Manual J Variables Added to Design Criteria

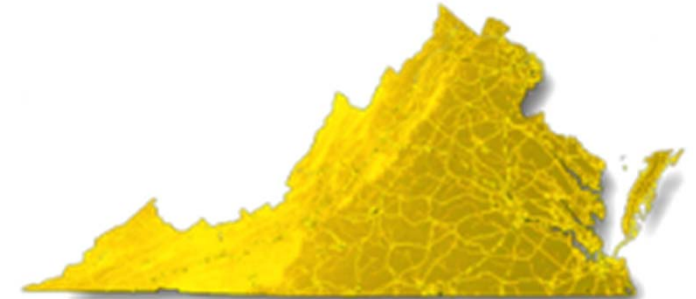
- Jurisdictions will now include variables for **Manual J assessments** in the building department's Design Criteria.

TABLE R301.2(1) Climatic and Geographic Design Criteria							
Ground Snow Load ^a	Wind Design				Wind-borne debris zone ^m	Seismic Design Category ^f	
	Speed ^d (mph)	Topographic effects ^k	Special wind region ^l				
Subject to Damage From			Winter Design Temp ^e	Ice Barrier Underlayment Required ^h	Flood Hazard ^g	Air Freezing Index ⁱ	Mean Annual Temp ^j
Weathering ^a	Frost line depth ^b	Termite ^c					
Manual J Design Criteria ⁿ							
<u>Elevation</u>	<u>Latitude</u>	<u>Winter Heating</u>	<u>Summer Cooling</u>	<u>Altitude Correction Factor</u>	<u>Indoor Design Temperature</u>	<u>Design Temperature Cooling</u>	
<u>Heating Temperature Difference</u>	<u>Cooling Temperature Difference</u>	<u>Wind Velocity Heating</u>	<u>Wind Velocity Cooling</u>	<u>Coincident Wet Bulb</u>	<u>Daily Range</u>	<u>Winter Humidity</u>	<u>Summer Humidity</u>

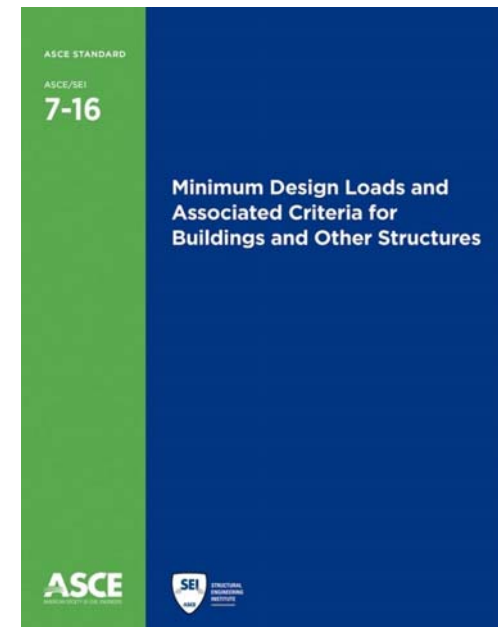
Wind Map Updates

Tables R301.2(2) and R301.2(3)

Figures R301.2(5)A, 301.2(5)B, and R301.2(8)

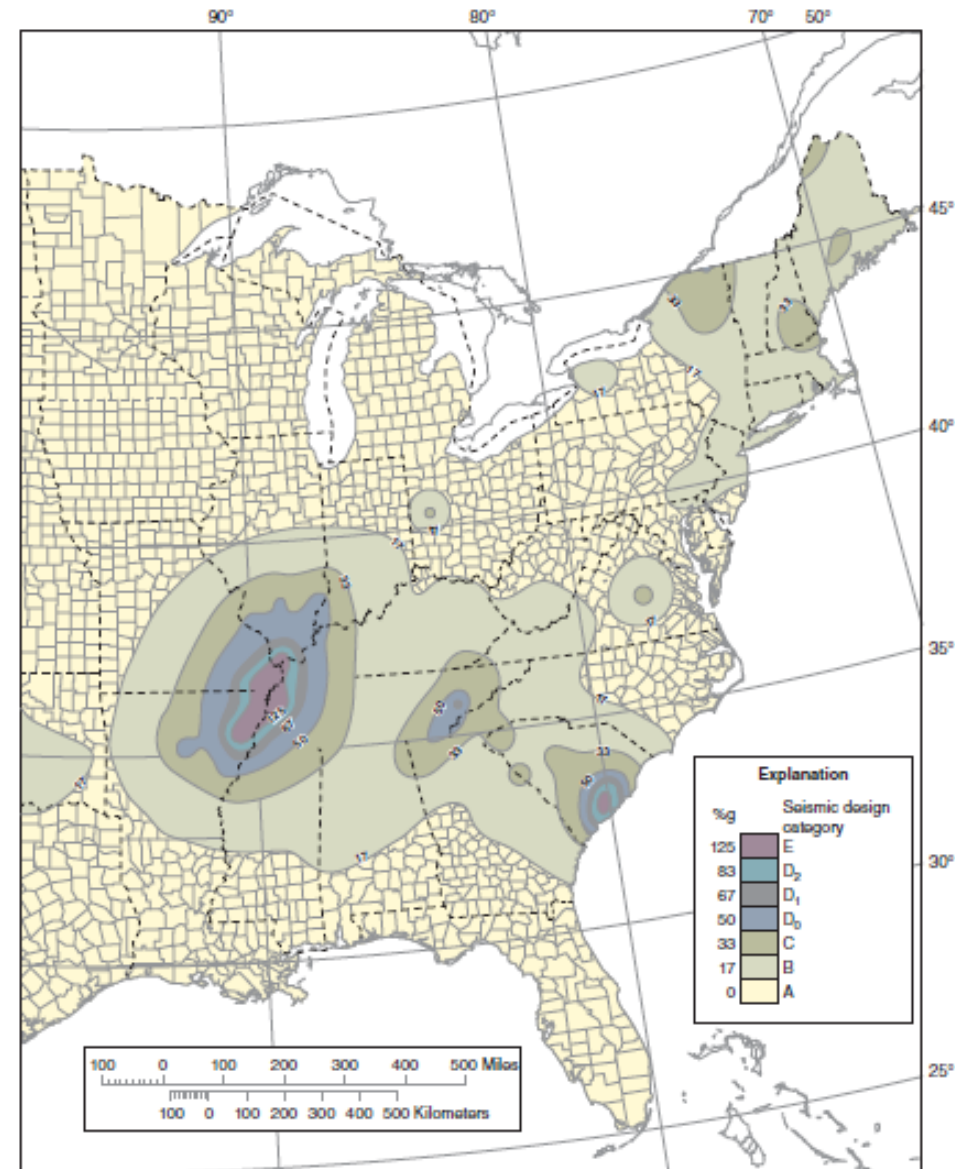


- Component and cladding tables and wind maps are updated to the current edition of ASCE 7



R301.2.2.1 – Seismic Design Category

- Seismic design maps have been updated with some significant changes for VA
- **VA now has a Category C seismic area**
- The Category B area has been modified slightly
- *Enlarged detail on next slide*



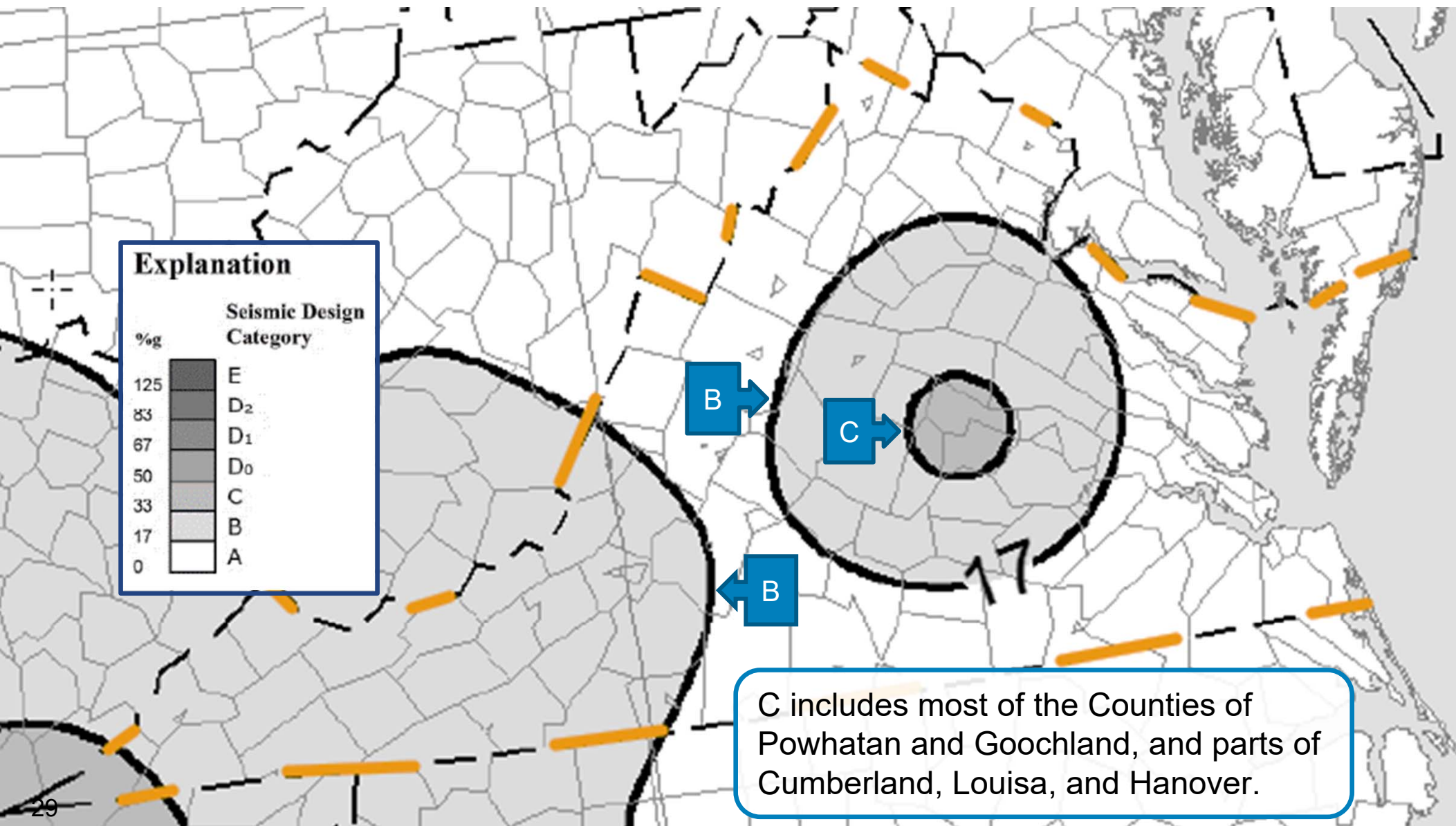
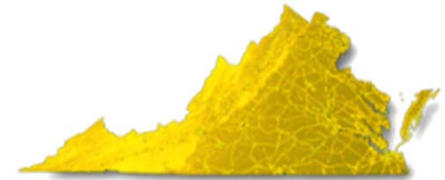


Table R302.1(1) – Fire Separation

ICC and VA changes reduce fire separation distances for exterior walls and projections



Also an IRC change

Strikeouts are additional VA amendments

TABLE R302.1(1)
EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E119, UL 263 or Section 703.3 of the <i>International Building Code</i> with exposure from both sides	0 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Projections	Not allowed	NA	< 2 feet
	Fire-resistance rated	1 hour on the underside, or heavy timber, or fire-retardant-treated wood ^{a, b}	≥ 2 feet to < 5 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Openings in walls	Not allowed	NA	< 3 feet
	25% maximum of wall area	0 hours	3 feet
	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet

For SI: 1 foot = 304.8 mm.

NA = Not Applicable.

- a. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave overhang if fireblocking is provided from the wall top plate to the underside of the roof sheathing.
- b. The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the rake overhang where gable vent openings are not installed.

R302.2.2 – Common Walls (separating townhouses)

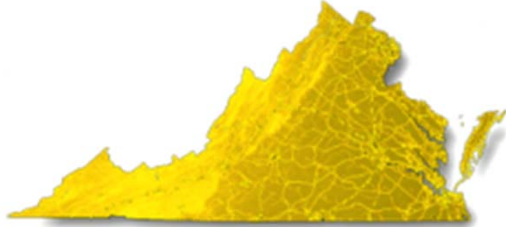


Sprinkler Piping Penetrations now Allowed

- New language added to R302.4.1 (through penetrations) and R302.4.2 (membrane penetrations) **permits water-filled sprinkler piping to penetrate the common wall** if certain other conditions are met.



R302.2.6

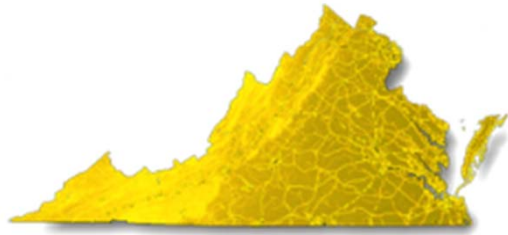


New Exception – Structural Independence

- Townhomes not required to be structurally independent if protected with sprinkler systems in accordance with P2904, NFPA 13, NFPA 13R, or NFPA 13D.



R309.3



Flood hazard areas - Garage floors

- Section has been simplified
- Now states that garages and carports located in flood hazard areas shall be constructed per section R322 (Flood-resistant construction)



R302.4.2

Membrane Penetrations

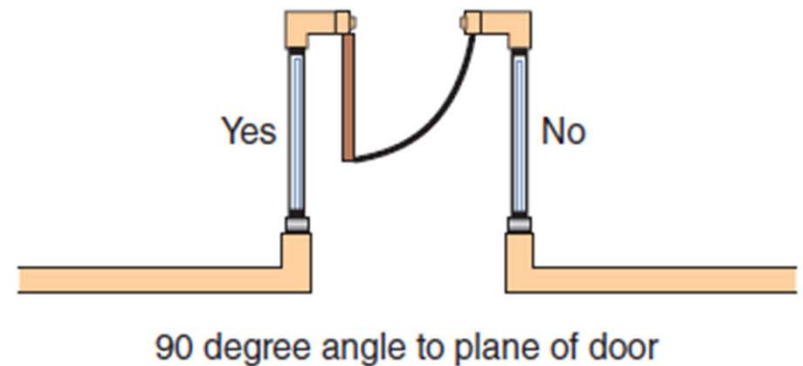
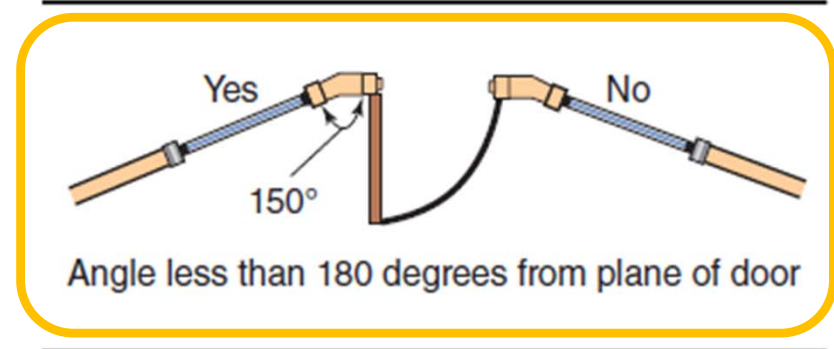
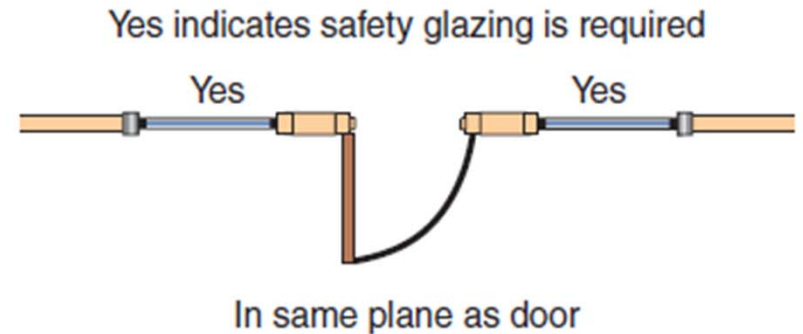
- Listed luminaires that have been tested for the application are specifically permitted for fire-resistant-rated ceiling membrane penetrations.



Recessed luminaire

R308.4.2 – Glazing Adjacent to Doors

- Glazing within 24" of the hinge side of an in-swinging door now requires safety glazing where the glazing is **less than 180 degrees from the plane of the door**.





Structural glass baluster panels



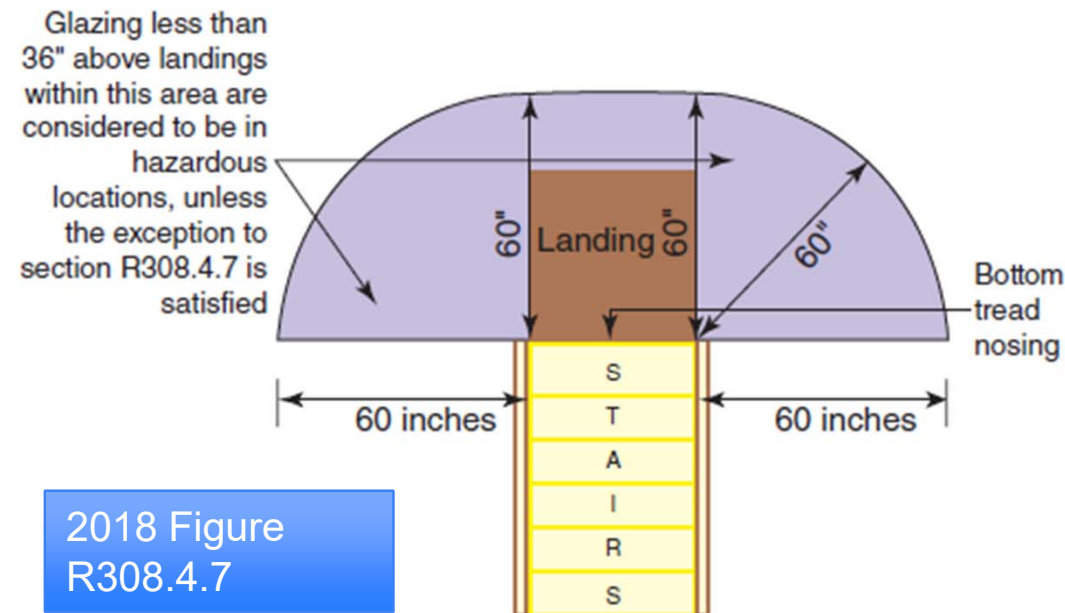
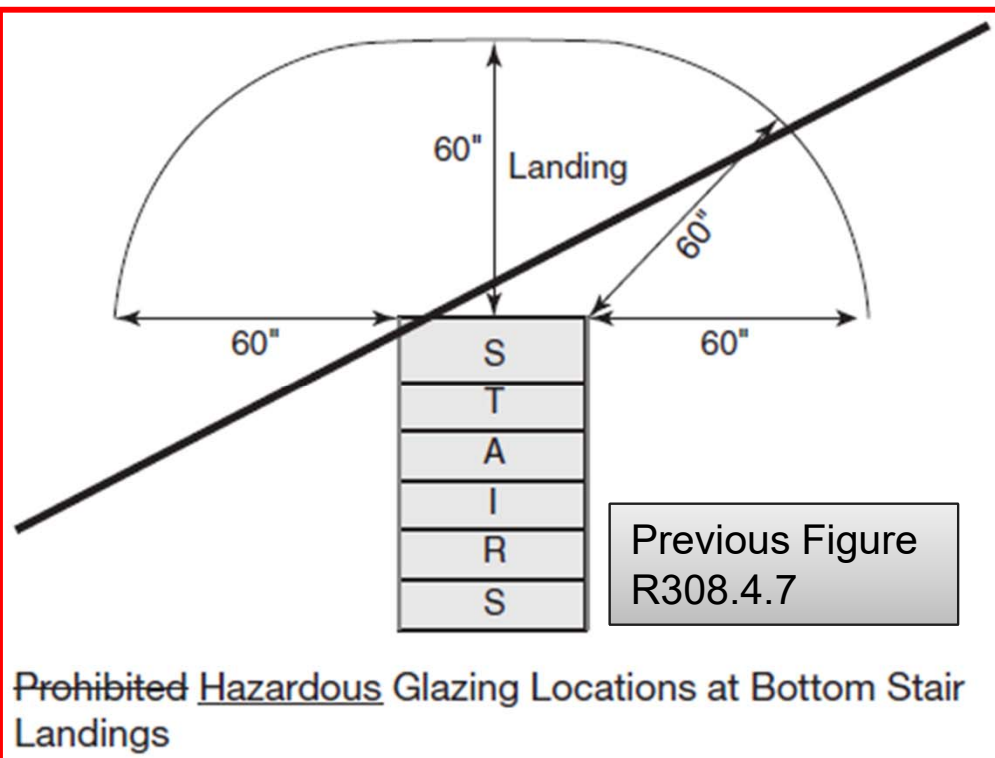
Non-structural glass in-fill panels

R308.4.4, R308.4.4.1 – Structural glass baluster panels

- Unless laminated glass is used, structural glass baluster panels in guards now require an attached top rail or handrail.

Figure R308.4.7 - Glazing Adjacent to the Bottom Stair Landing - Clarification

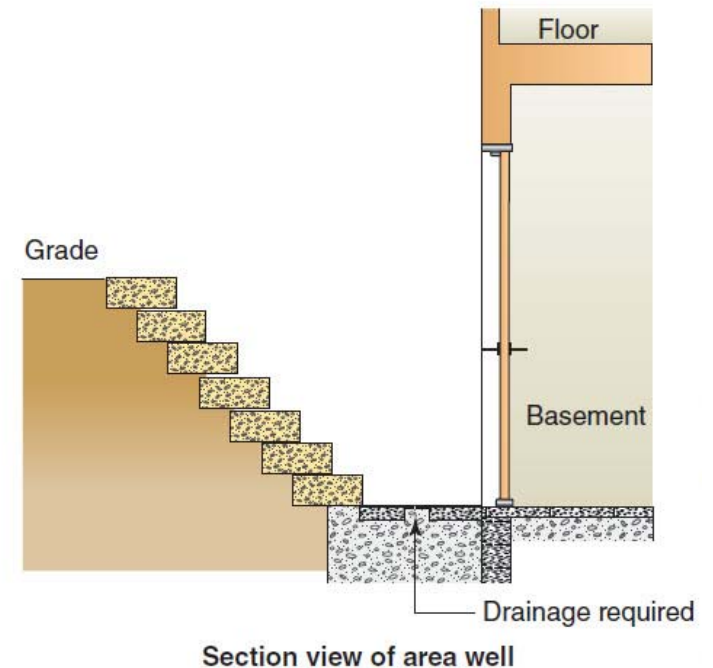
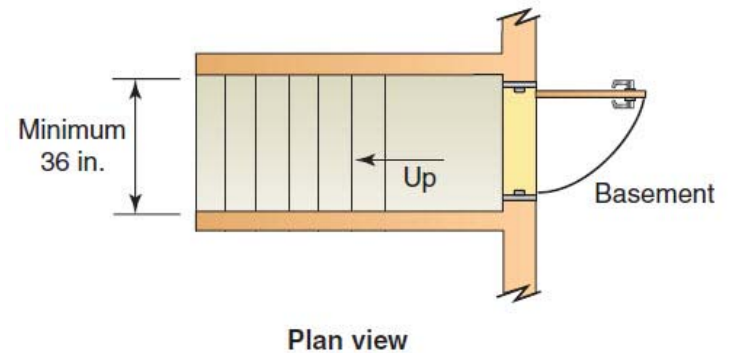
- Figure R308.4.7 has been replaced with a new figure and the caption modified to more accurately reflect the related code provision.



R310.3

Area Wells for Emergency Escape and Rescue Doors

- For emergency escape and rescue doors in basements, a change in terminology replaces “bulkhead enclosures” with “area wells” and provisions for ladders and steps for area wells have been added.

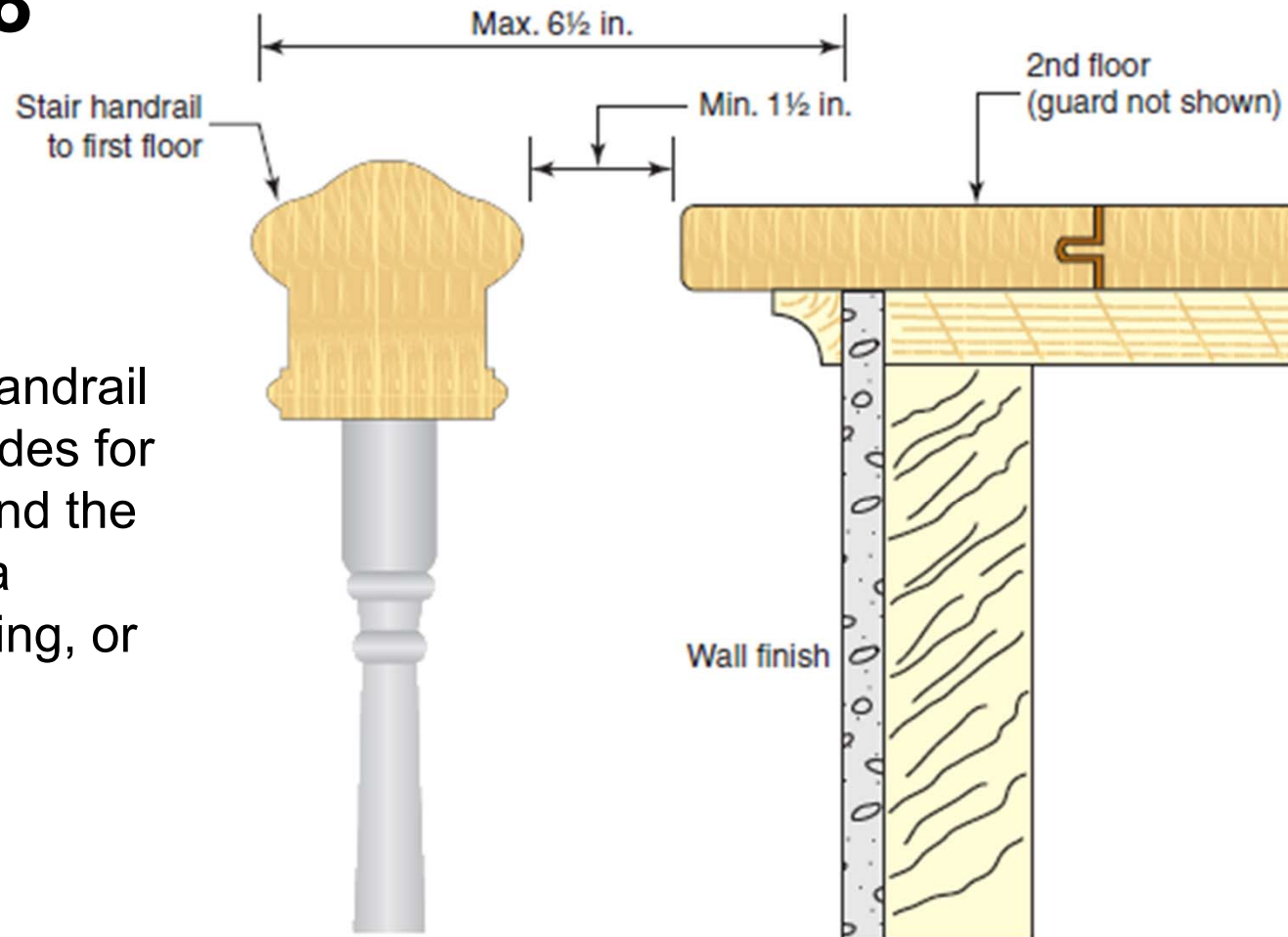


Door serving as a required emergency escape and rescue opening from a basement with an area well

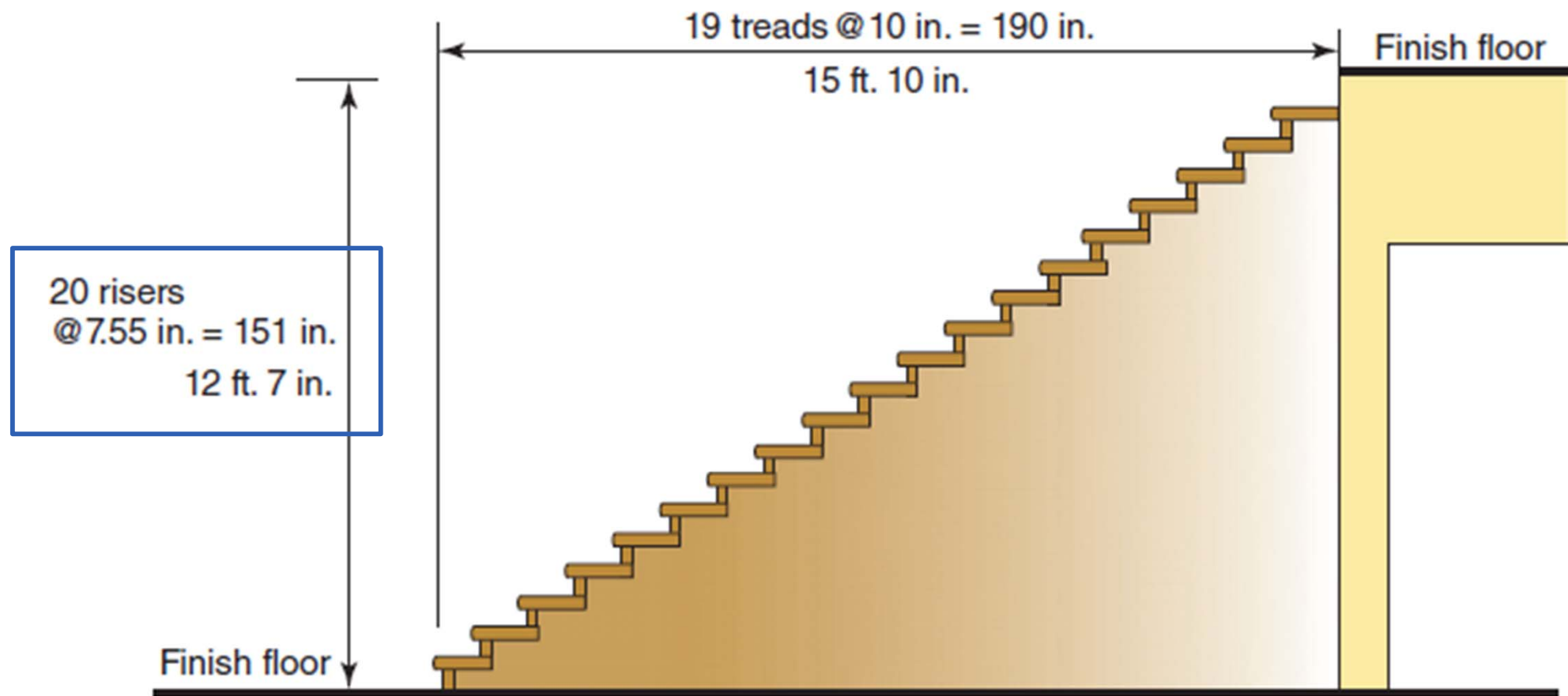
R311.7.1, R311.7.8

Handrail Projection

- A new exception to the handrail projection limitation provides for adequate clearance behind the handrail when it passes a projection of a floor, landing, or tread return.



Greater projection allowed where handrail passes a floor nosing

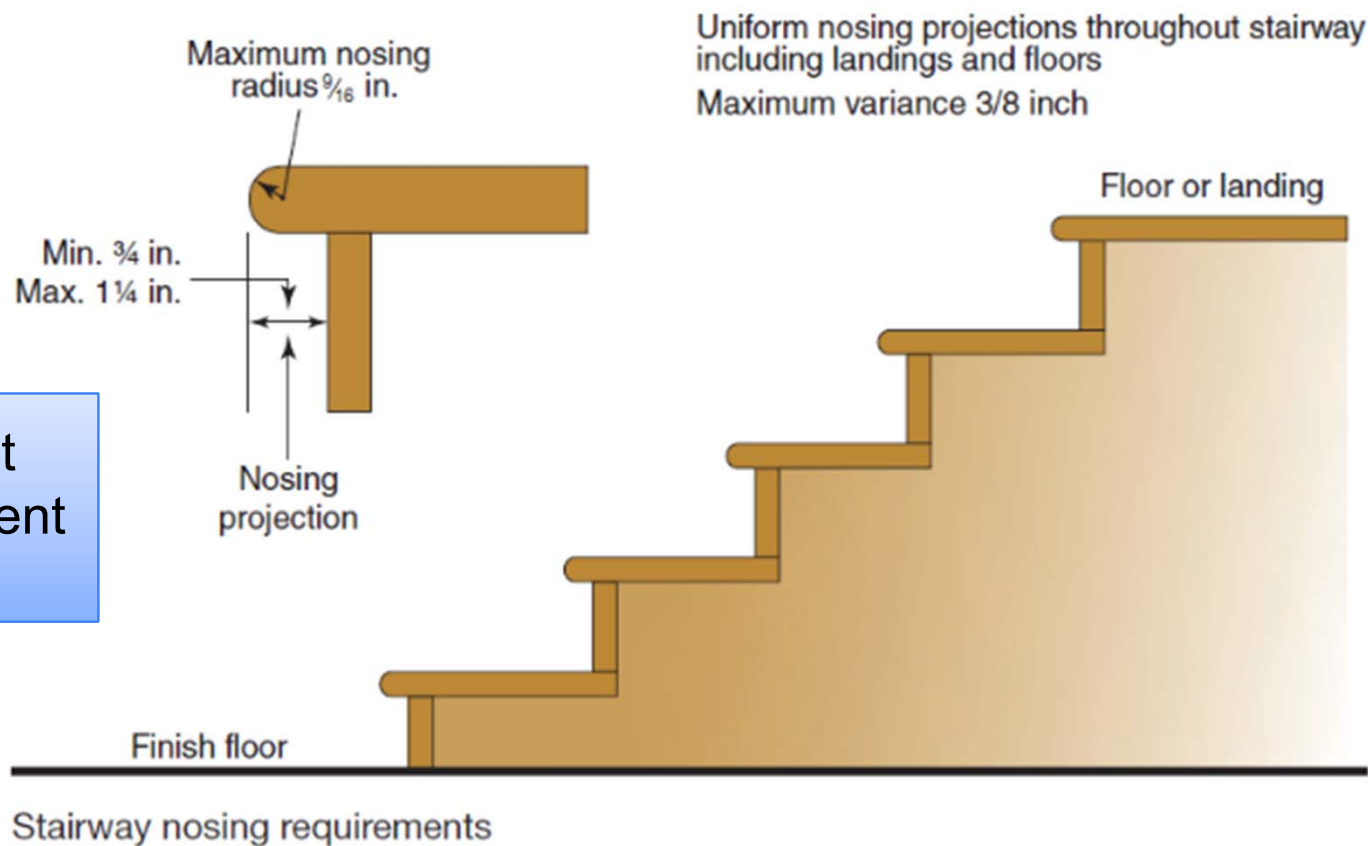


R311.7.3 - Maximum Stair Rise between floor levels or Landings

- The maximum rise has increased by 4 inches, from 147 to **151 inches**.

R311.7.5.3 – Stair Nosings - Clarification

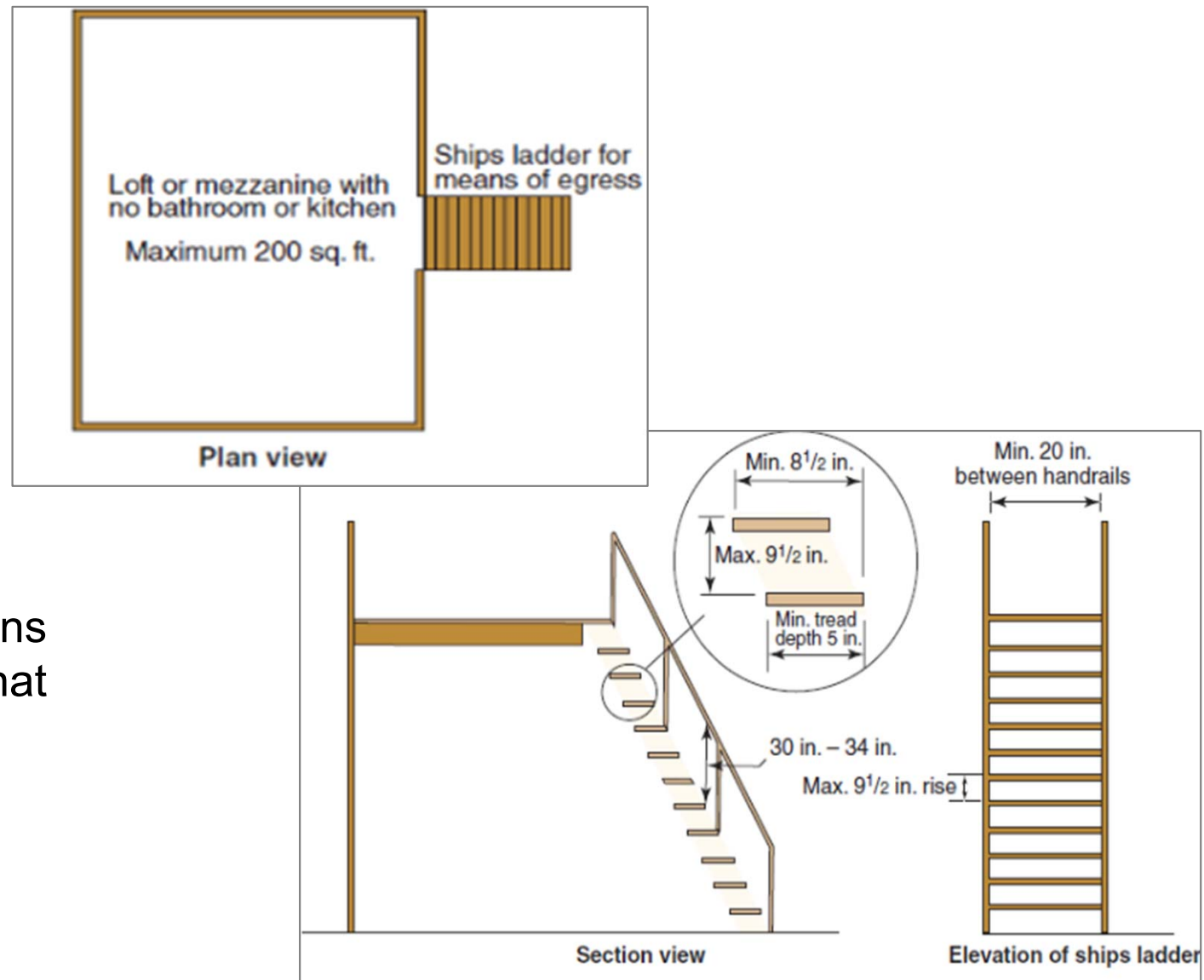
Revised text clarifies that nosings must be consistent throughout the stairway.



R311.7.11, R311.7.12

Alternating Tread Devices and Ships Ladders

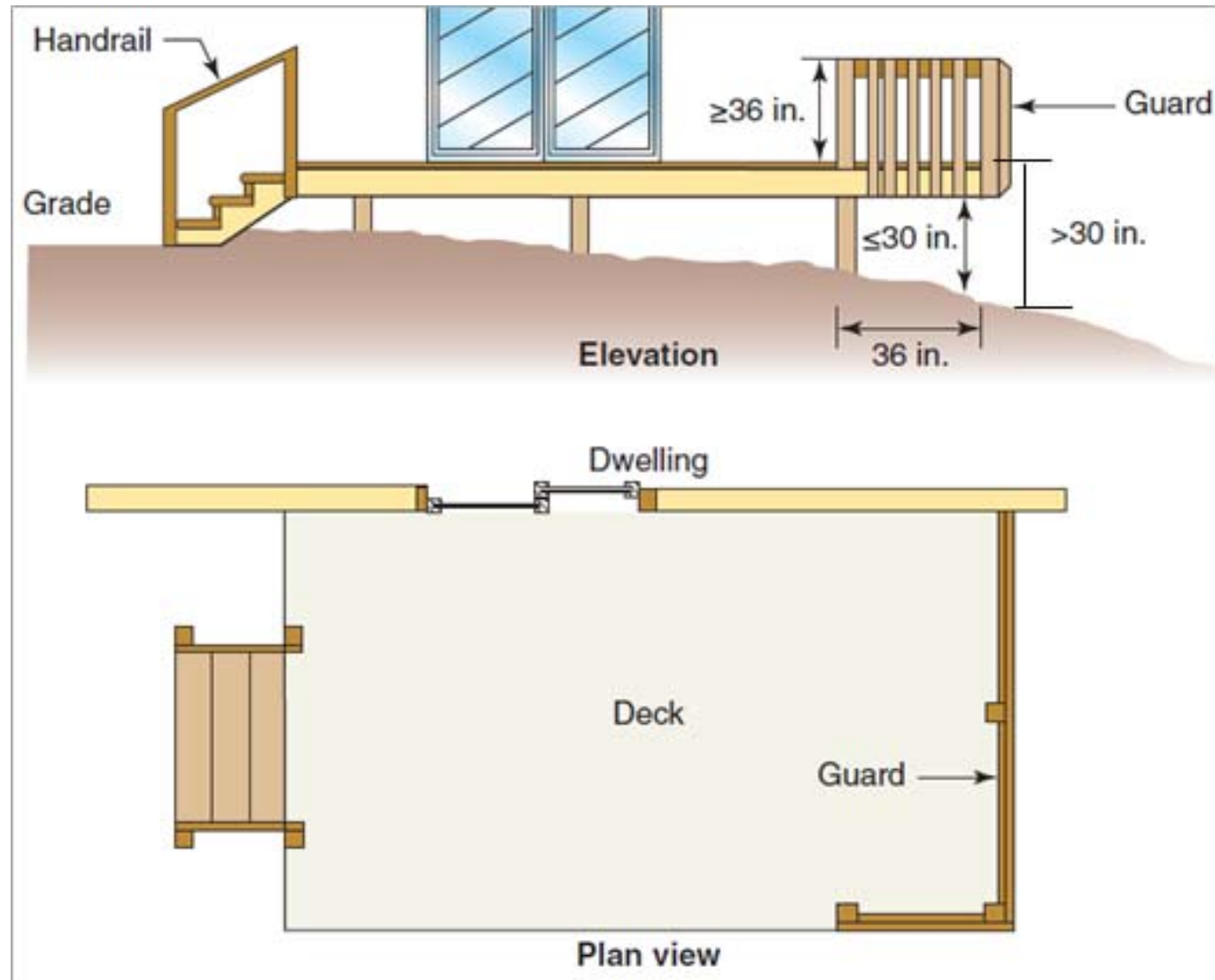
- Alternating tread devices and ships ladders are now permitted as a means of egress for lofts that do not exceed 200 square feet.



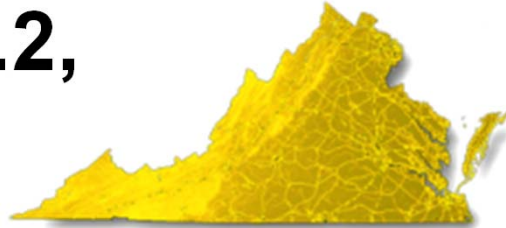
R312.1

Guards - Clarification

- The guard requirements only apply to the **specific portion of a walking surface** that exceeds 30 inches above grade.



R313.1.1, R313.2, R313.2.1

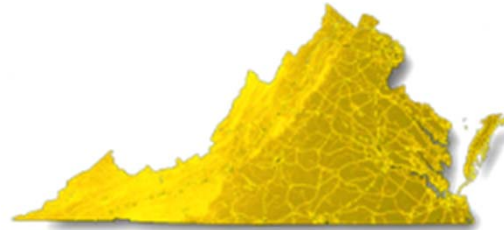


13 and 13R systems permitted

- Adds two additional sprinkler design options for townhomes and one and two-family dwellings: NFPA 13 and NFPA 13R



R314.6



Smoke Alarm Power Source

- Exception modified to require a minimum 10-year battery “where installed in buildings without commercial power”
- Second exception deleted

Exceptions:

1. Smoke alarms shall be permitted to be battery operated with a minimum 10-year battery where installed in buildings without commercial power.
- ~~2. Smoke alarms installed in accordance with Section R314.2.2 shall be permitted to be battery powered.~~



R315.5 - Carbon Monoxide Alarm Interconnectivity

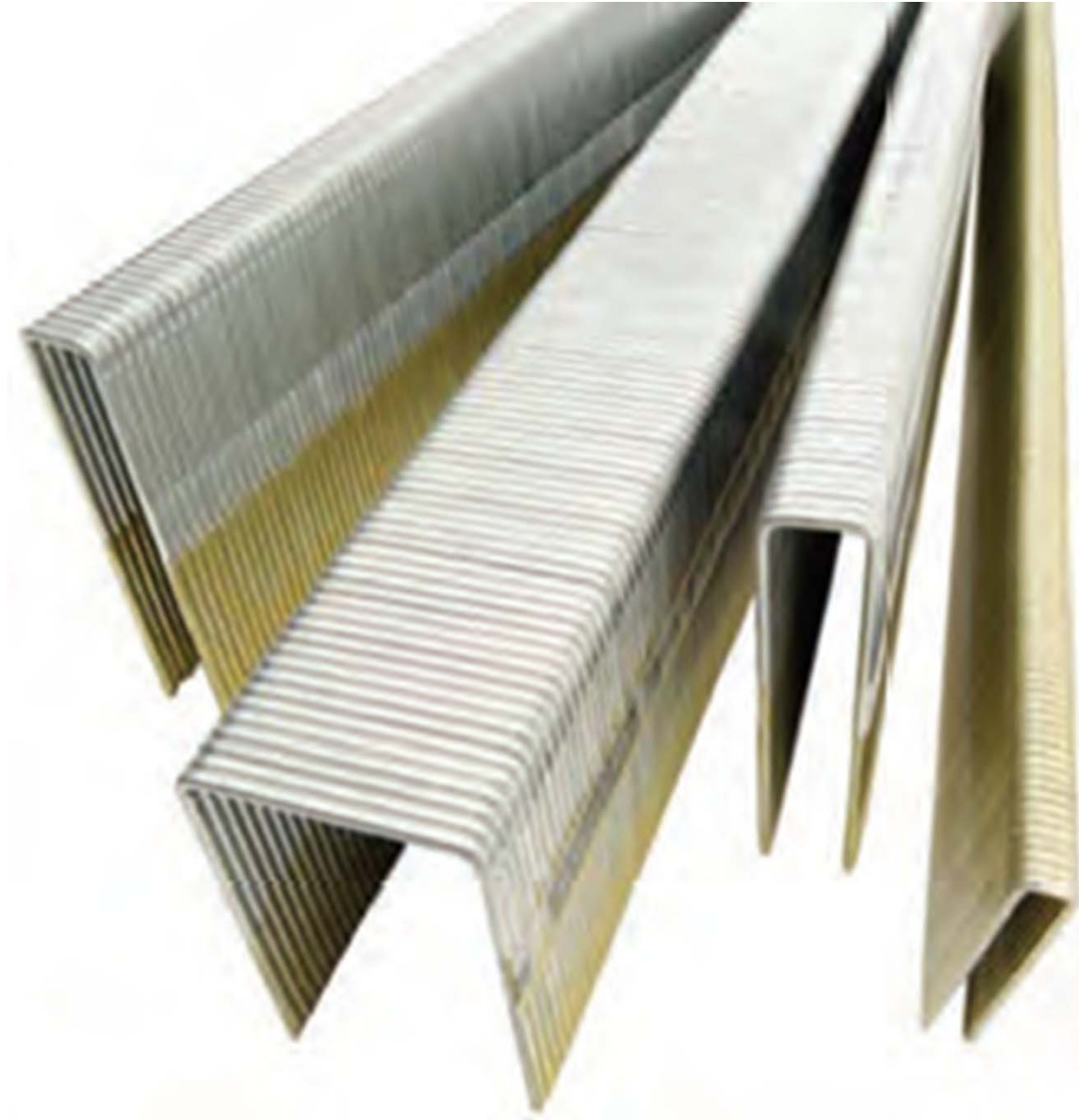
- If multiple CO alarms are installed in a individual dwelling unit, they must be interconnected such that one alarm must activate **all alarms**.
- Physical interconnection is not required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.



R317.3

Fasteners in Treated Wood

- Staples in preservative-treated wood and fire-retardant-treated wood are now required to be made of stainless steel.



R324.4

Rooftop-Mounted Photovoltaic Systems

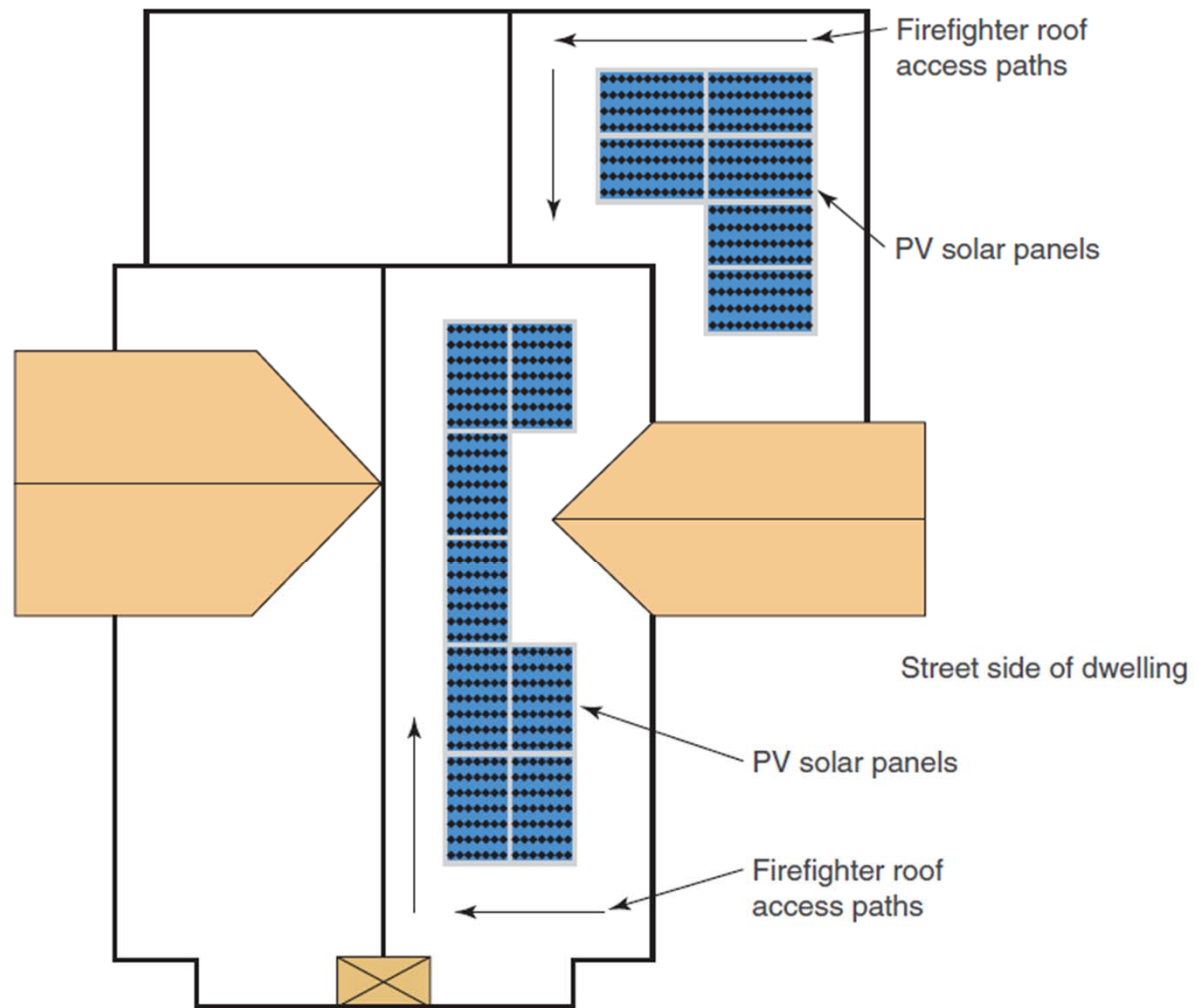
- Structural requirements for rooftop-mounted photovoltaic panel systems have been revised and consolidated in Section R324.4.



R324.6

Roof Access for Photovoltaic Solar Energy Systems

- Requirements for roof access and pathways for firefighters have been added.

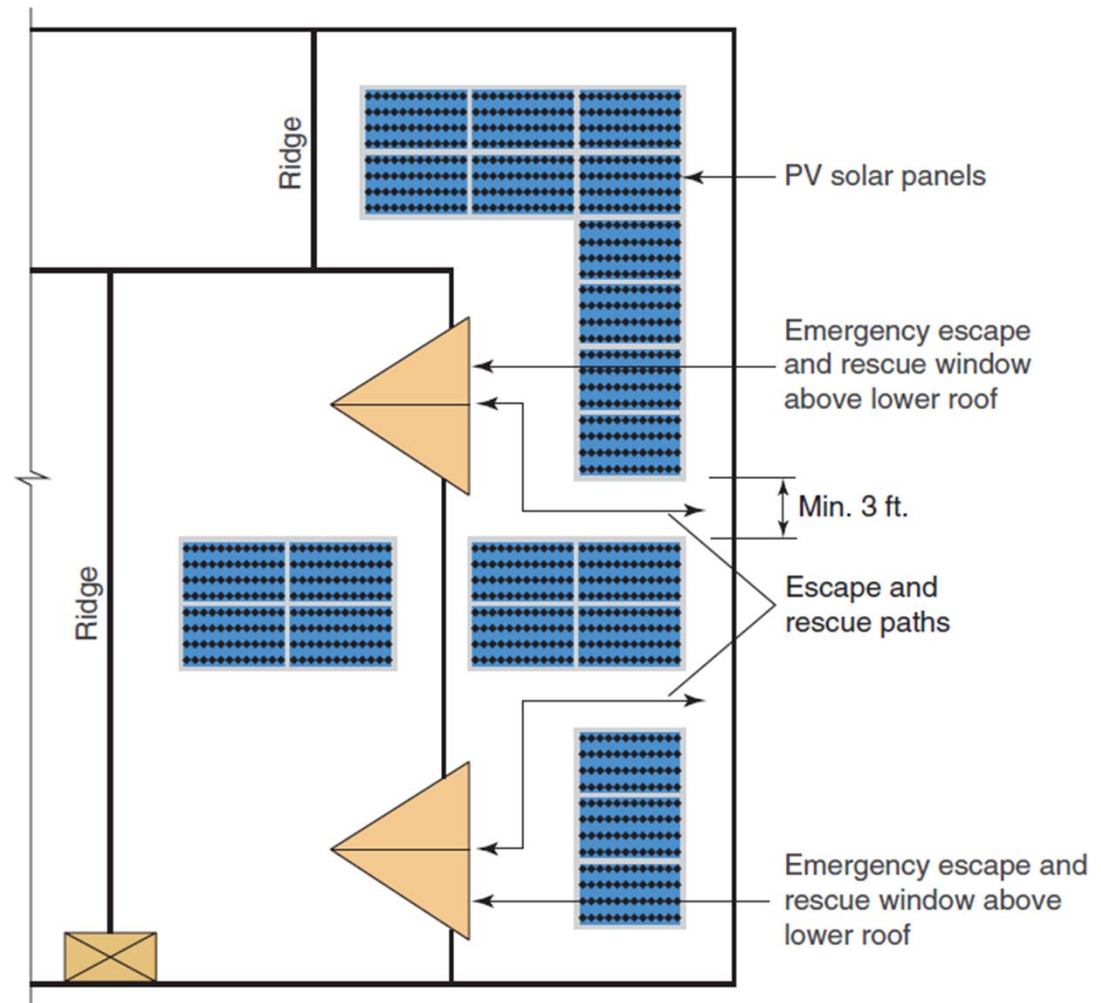


Required roof access and pathways for firefighters for roof-mounted PV solar systems

R324.6.2.2

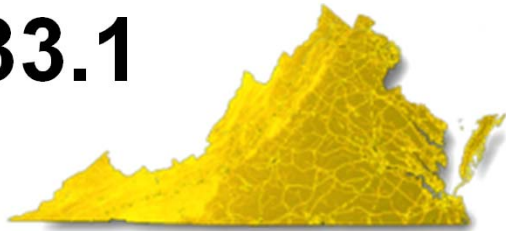
Solar Panels near Emergency Escape and Rescue Openings

- Rooftop-mounted photovoltaic solar energy panels and modules are not permitted to be installed directly below emergency escape and rescue openings.



A 36-inch-wide pathway is required for emergency escape and rescue openings above roof-mounted PV solar panels.

R333, R333.1



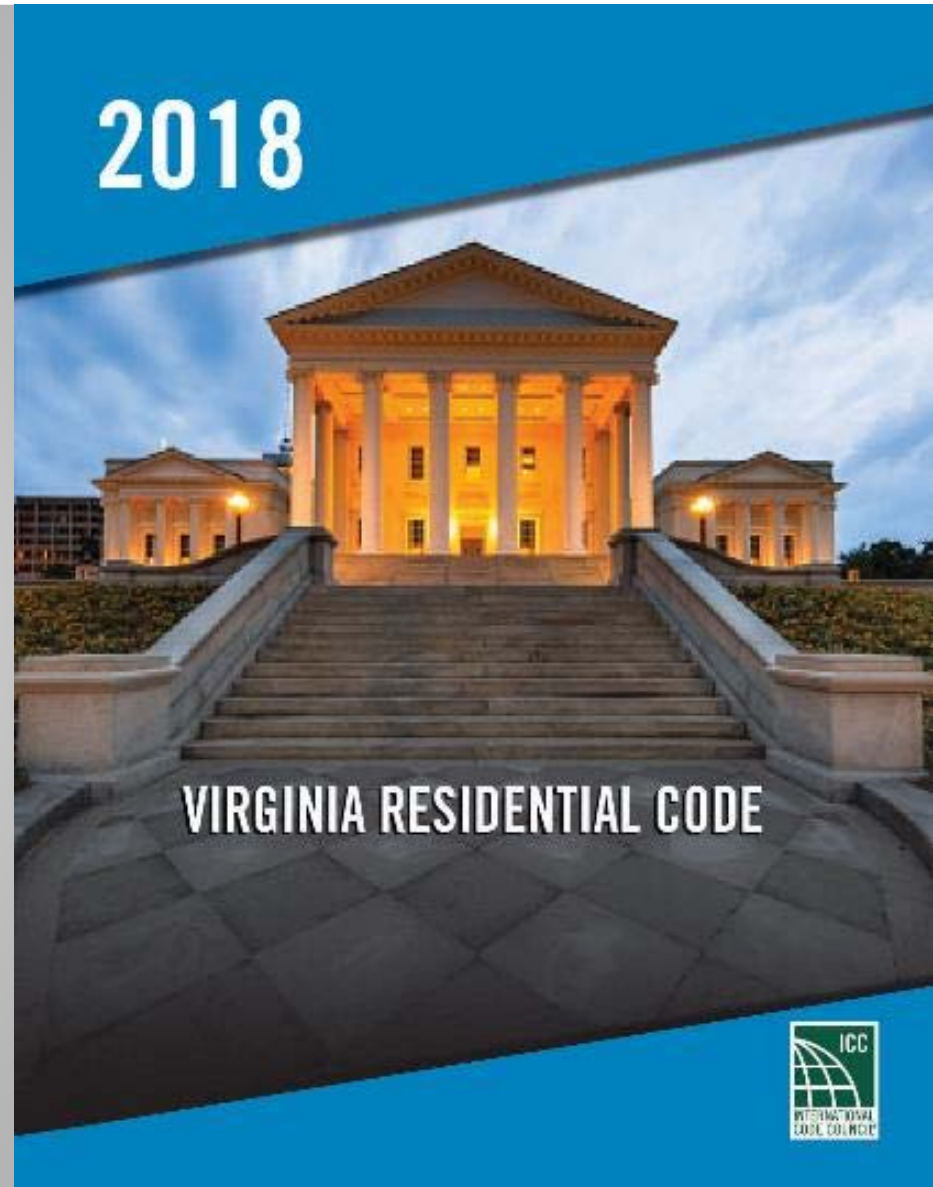
Tiny Houses

- New section references Appendix Q for Tiny Houses (400 sq ft or less in floor area)

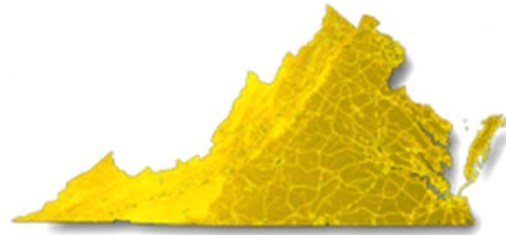


Chapter 4

Foundations



R403.1.6



Foundation Anchorage

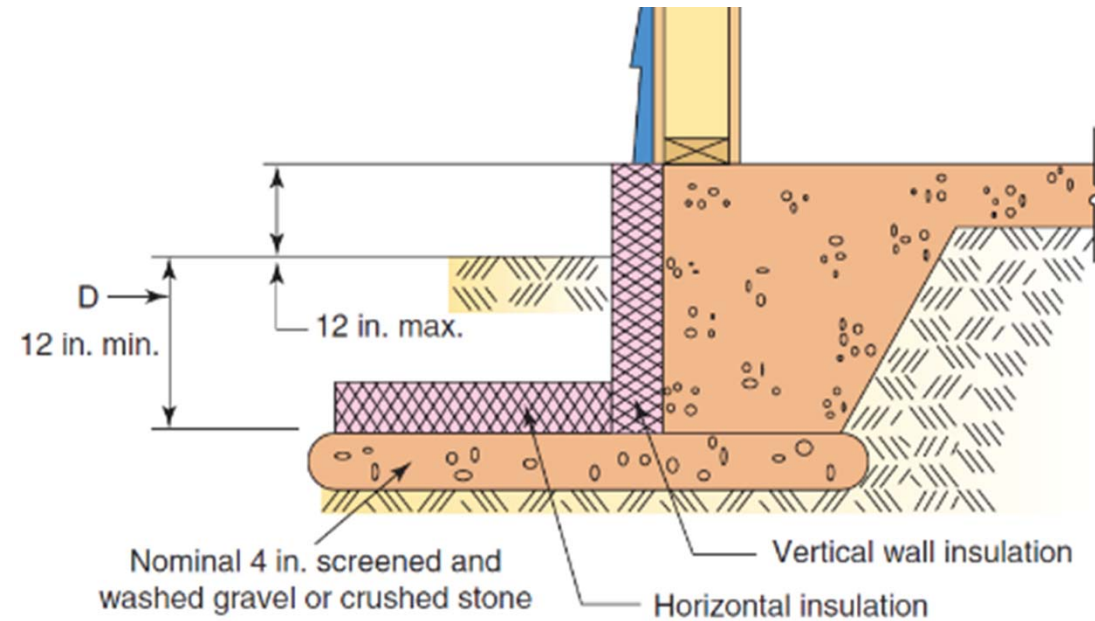
- A few minor changes in this section
 - Specifies *steel* bolts for consistency with IBC language
 - The bolt location description is modified
 - Adds "properly sized" for nuts and washers already required on each anchor bolt



Table R403.3(1)

Insulation Requirements for Frost-Protected Footings

- Insulation thickness requirements for Type II and IX expanded polystyrene (EPS) have changed.
- The minimum R-value for specific types of EPS has been clarified while requirements for horizontal insulation were added.



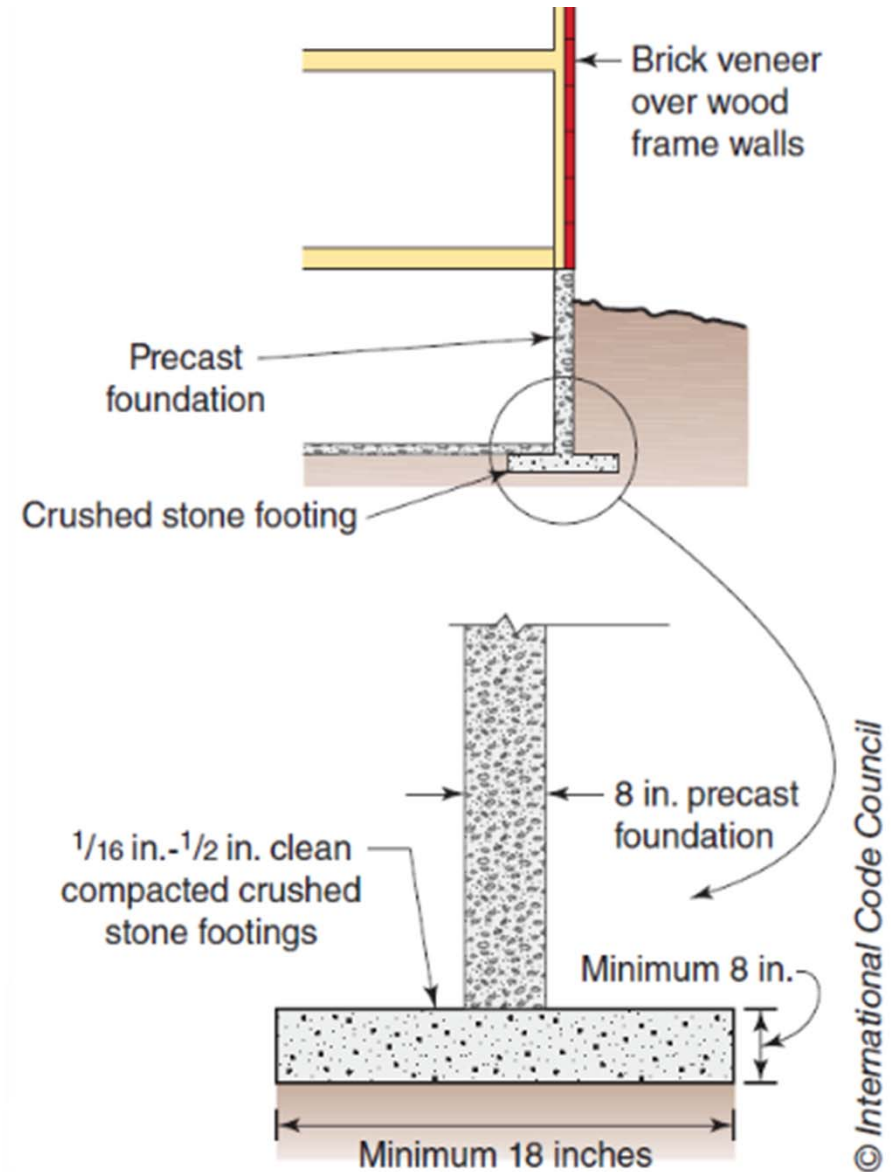
EPS placement in a frost-protected shallow foundation



Table R403.4

Crushed Stone Footings

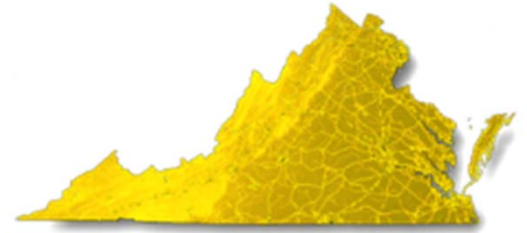
- Table R403.4 is updated to include both the minimum depth and width of a crushed stone footing for a precast concrete wall.



R408.1

Ventilation Moisture Control

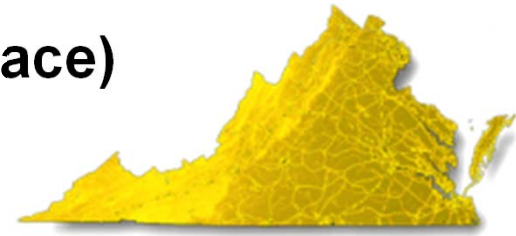
- 1 of 3 changes to simplify and clarify R408 – Under-Floor Space
- Better formats the section for the two methods of treating under-floor spaces: vented and unvented.
- Vent placement requirements are also clarified.



R408.2

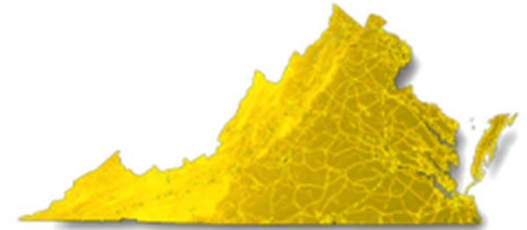
Openings for under-floor ventilation (vented crawl space)

- Clarifies the requirements for a vented crawl space
- Exceptions also clarified
 - Area reduction allowed if an approved Class I vapor retarder is installed
 - Vent within 3' of each external corner not required if Class I vapor retarder AND vents are placed to provide cross-ventilation





R408.3

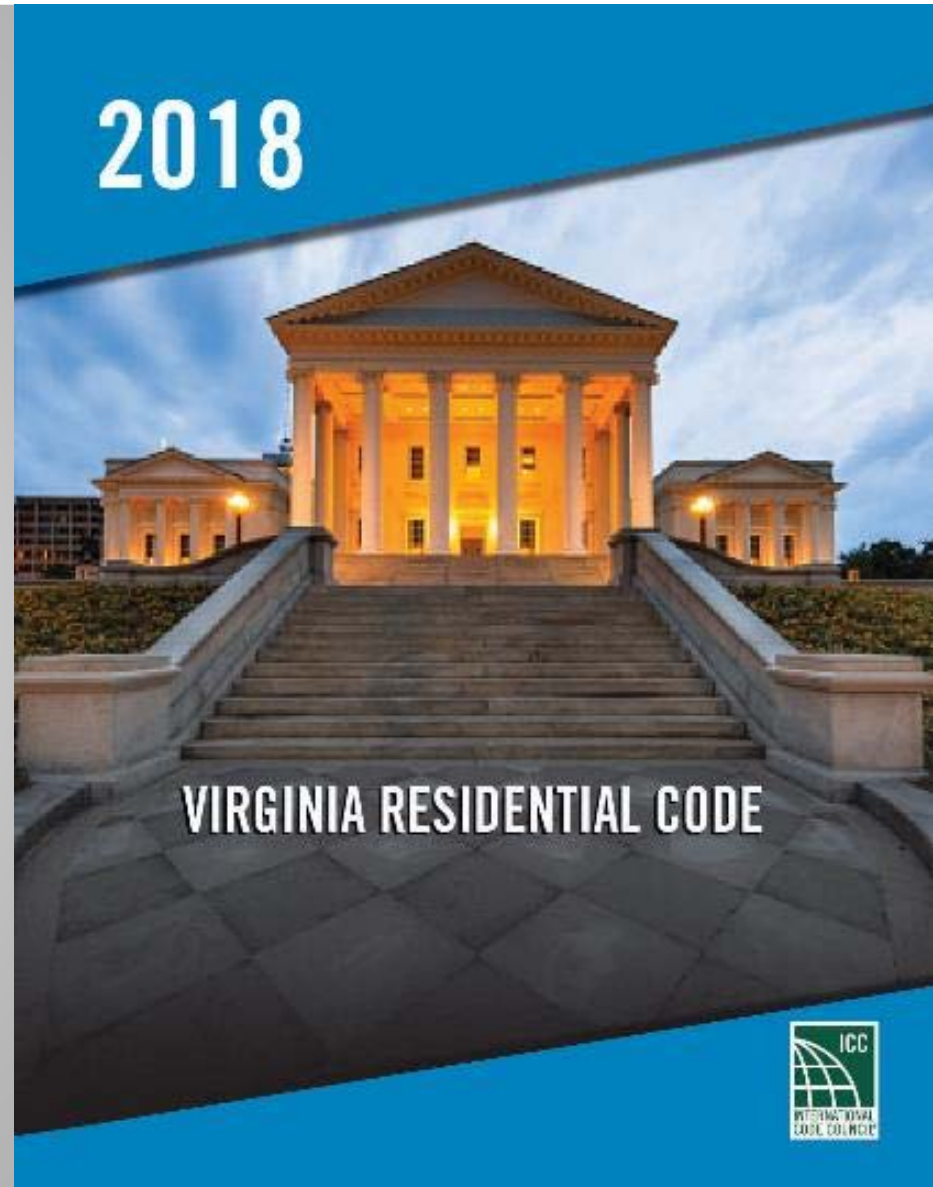


Unvented crawl space

- Lists specific requirements for unvented crawl spaces
- Also includes new option #4 for dehumidification (also an IRC change)

What questions
do you have?

Skill Check 2



Chapter 5

Floors

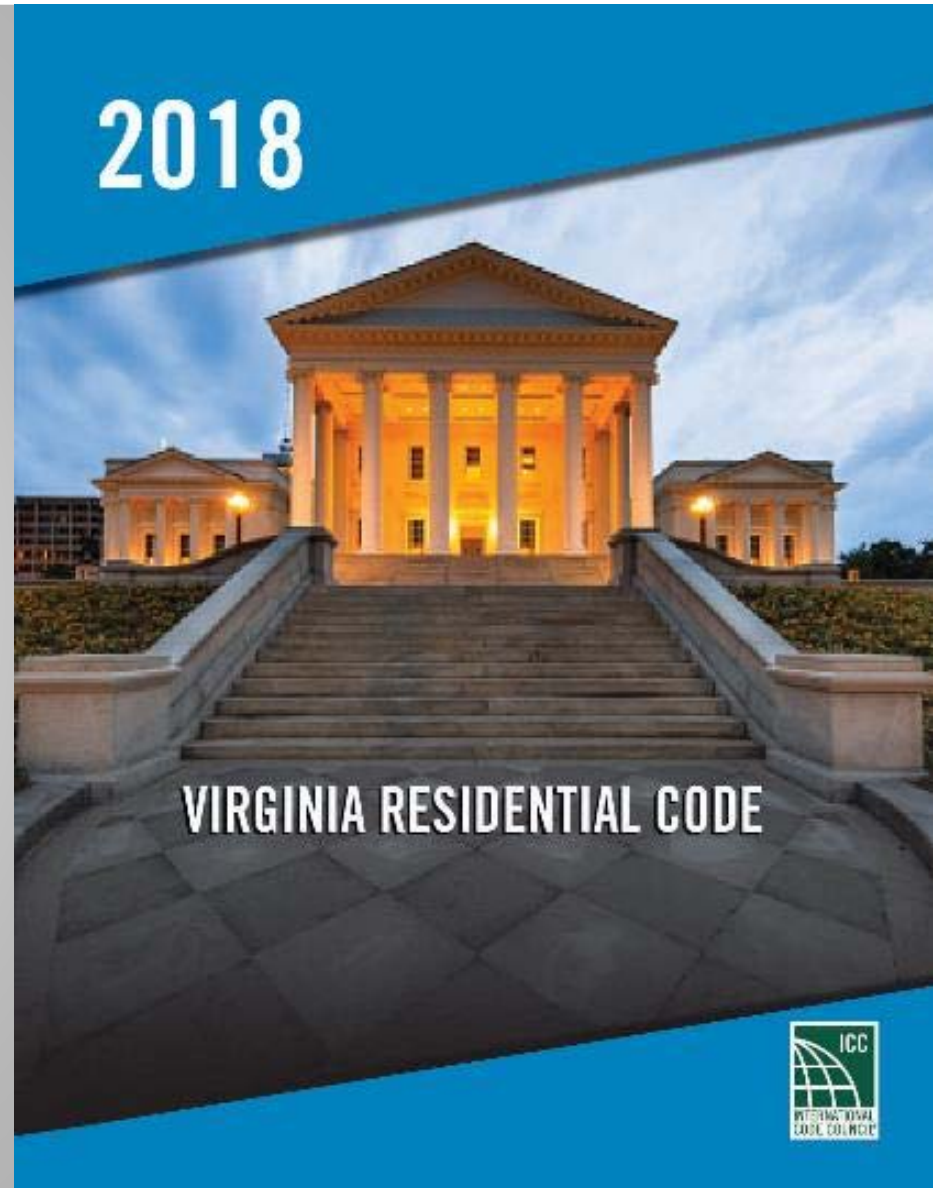


Table R505.3.2

Cold-Formed Steel Joist Spans

- Updated to be consistent with the 2015 AISI S230 Standard for *Cold-Formed Steel Framing-Prescriptive Method for One- and Two-Family Dwellings*.
- Maximum joist spans are updated for wind speeds up to 140 mph
- Footnote f is added to clarify that 33 and 43 mil thickness joists need to be single span joists when using this prescriptive table.



R507 Decks – A Complete Reorganization

- Reorganized for ease of use and additional provisions are added to simplify the prescriptive construction of a deck

TABLE 5-1 Deck Section Reorganization

2018 IRC Section Numbers		2015 IRC Section Numbers		2012 IRC Section Numbers	
Section	Topic	Section	Topic	Section	Topic
R507.1	Decks	R507.1	General	R507.1	Decks
R507.2	Materials	New			
R507.2.1	Wood materials				
R507.2.1.1	Engineered wood products				
R507.2.2	Plastic composite elements	R507.3	Plastic composite elements	R507.3	Wood/plastic composites
R507.2.2.1	Labeling	R507.3.1	Labeling	New	
R507.2.2.2	Flame spread	R507.3.2	Flame spread		
R507.2.2.3	Decay	R507.3.2	Decay		

R507.2 - Deck Materials

- Adds requirements for fasteners and fastener connections, flashing and alternative materials.





R507.3 - Deck Footings

- An entirely new section on footing minimum size is added to help describe minimum prescriptive (non-engineered) requirements for an exterior deck footing based on snow load, soil quality, and footing shape and size.

R507.4

Deck Posts

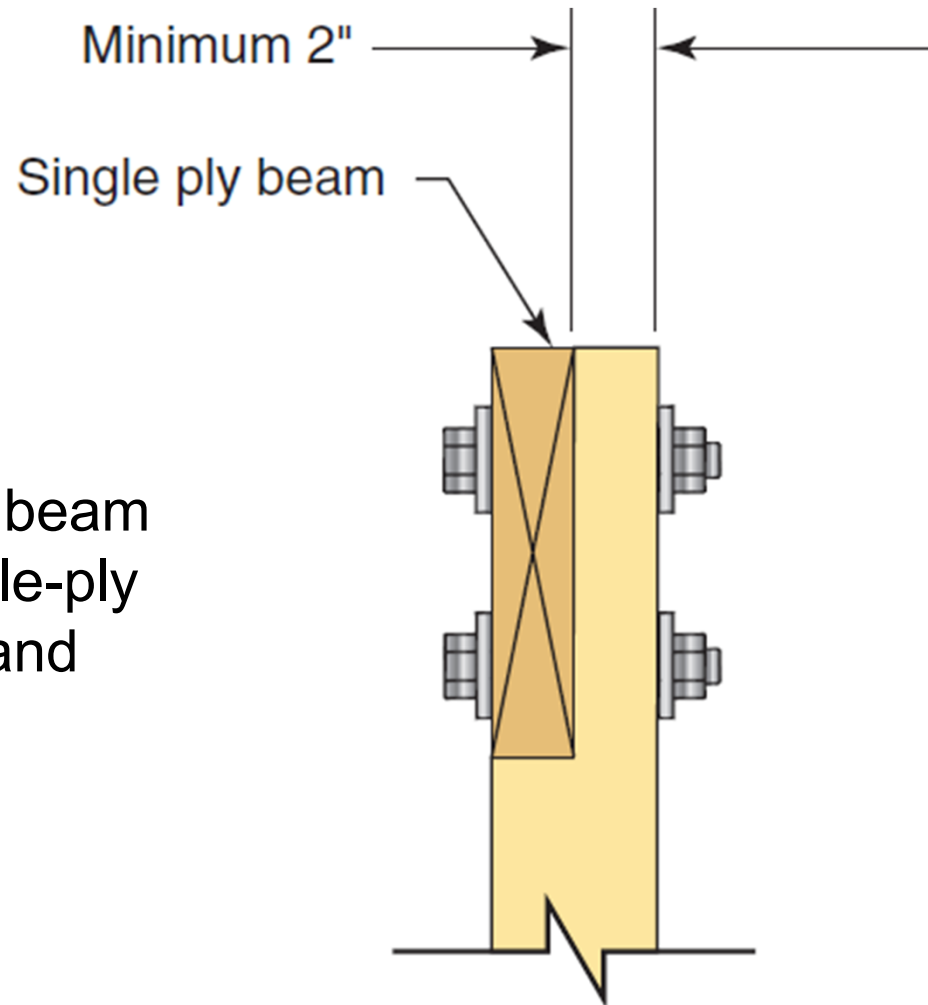
- Information on deck posts moves to the middle of Section R507 as topics flow in the order of construction sequence.
- The section has been clarified adding additional prescriptive or non-engineered options.



R507.5

Deck Beams

- The table on maximum beam span now includes single-ply beams. Beam bearing and connection to posts are clarified.



R507.6

Deck Joists

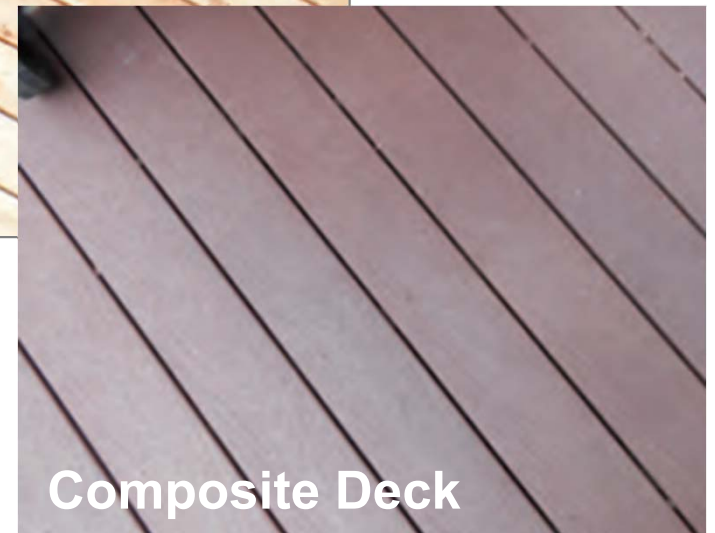
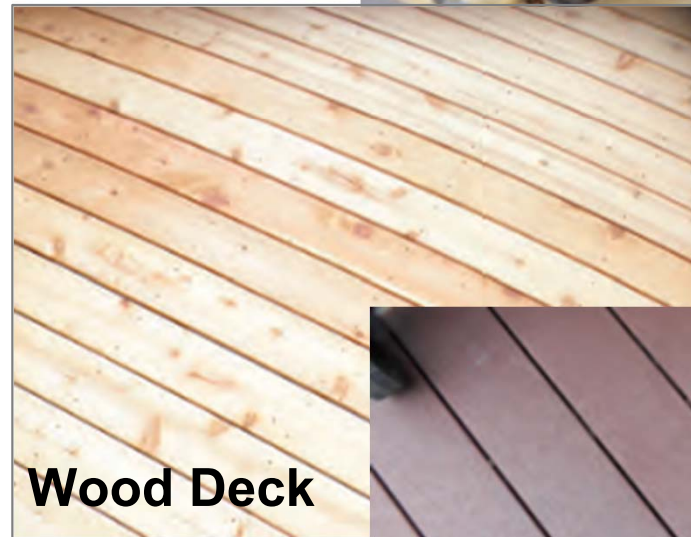
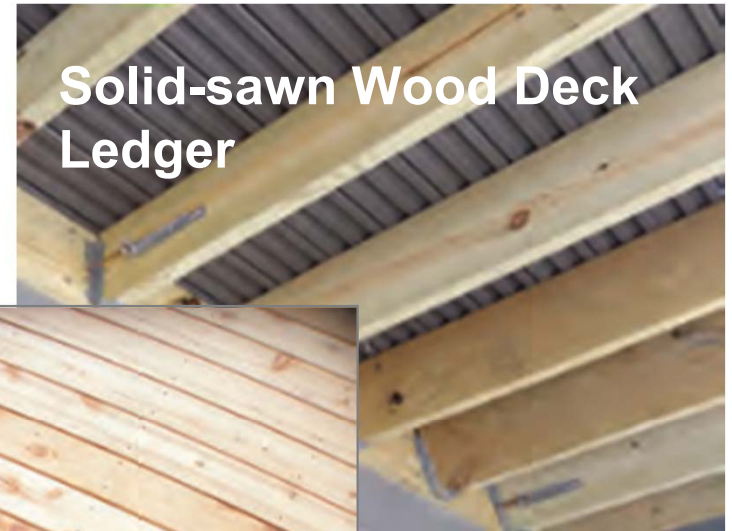
- Maximum joist spacing and total span length have been clarified.
- In Table R507.6, maximum span length is listed followed by maximum cantilever length.



R507.7, R507.8, R507.9

Decking, Vertical and Lateral Support

- Decking material options and fastener systems are clarified.
- Vertical and horizontal support of an exterior deck is updated while additional details on support and attachment of ledgers are added.



Chapter 6

Wall Construction

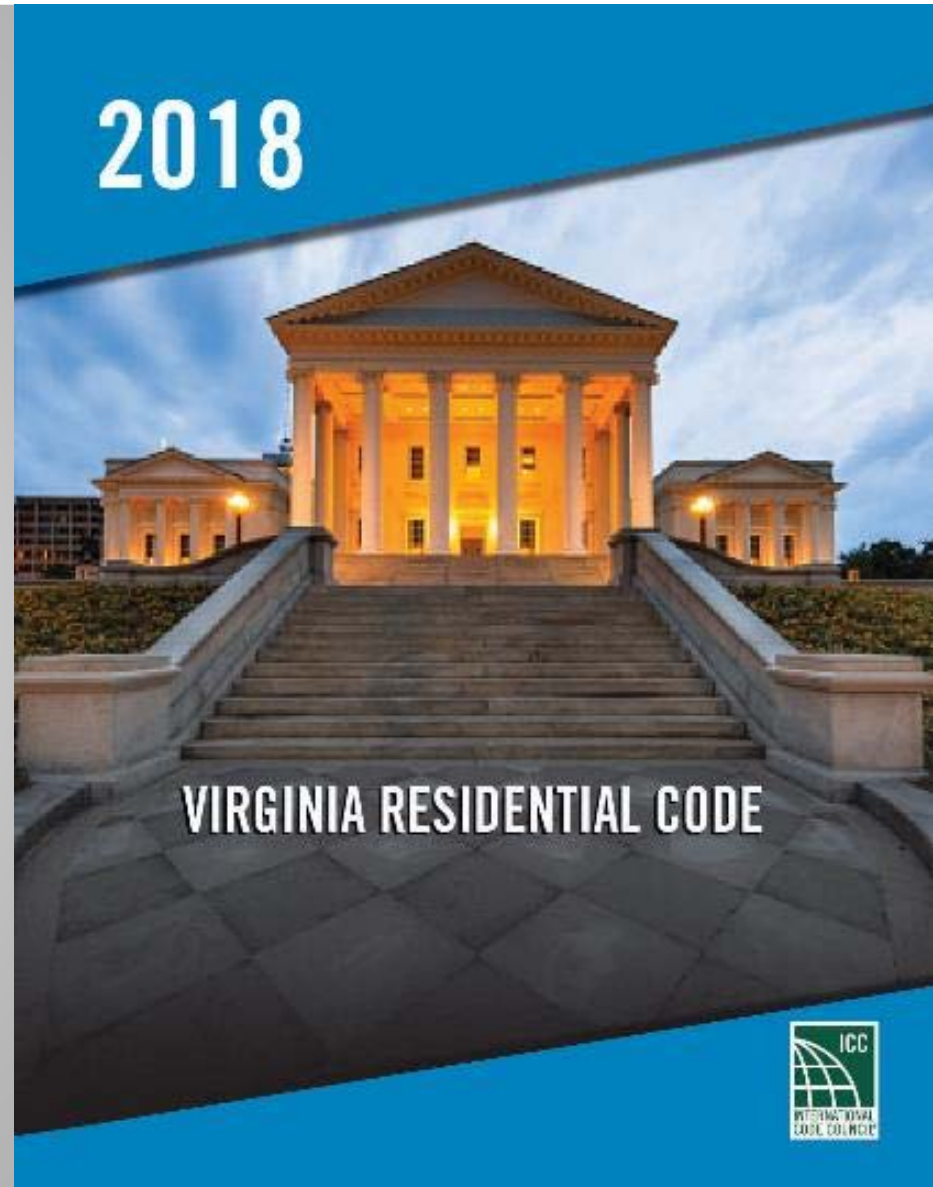


Table R602.3(6)

Alternate Stud Height

- A prescriptive requirement is added for studs greater than 10 feet in height...that applies to 11- and 12-foot-tall walls in one- and two-story buildings.



TABLE R602.3(6) Alternate Wood Bearing Wall Stud Size, Height and Spacing

			<u>Ultimate Design Wind Speed</u>					
			<u>115 mph</u>		<u>130 mph^b</u>		<u>140 mph^b</u>	
			<u>Maximum Roof/Floor Span^c</u>		<u>Maximum Roof/Floor Span^c</u>		<u>Maximum Roof/Floor Span^c</u>	
<u>Stud Height</u>	<u>Supporting</u>	<u>Stud Spacing^a</u>	<u>12 ft.</u>	<u>24 ft.</u>	<u>12 ft.</u>	<u>24 ft.</u>	<u>12 ft.</u>	<u>24 ft.</u>
<u>11 ft.</u>	<u>Roof Only</u>	<u>12 in.</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 4</u>
		<u>16 in.</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 6</u>	<u>2 × 4</u>	<u>2 × 6</u>
		<u>24 in.</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>
	<u>Roof and One Floor</u>	<u>12 in.</u>	<u>2 × 4</u>	<u>2 × 6</u>	<u>2 × 4</u>	<u>2 × 6</u>	<u>2 × 4</u>	<u>2 × 6</u>
		<u>16 in.</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>
		<u>24 in.</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>
<u>12 ft.</u>	<u>Roof Only</u>	<u>12 in.</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 4</u>	<u>2 × 6</u>	<u>2 × 4</u>	<u>2 × 6</u>
		<u>16 in.</u>	<u>2 × 4</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>
		<u>24 in.</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>
	<u>Roof and One Floor</u>	<u>12 in.</u>	<u>2 × 4</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>
		<u>16 in.</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>
		<u>24 in.</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>2 × 6</u>	<u>DR</u>

TABLE R602.7.5 Minimum Number of Full Height Studs at Each End of Headers in Exterior Walls^a

<u>Maximum Header Span (feet)</u>	<u>Ultimate Design Wind Speed and Exposure Category</u>	
	<u>≤ 115 mph, Exposure B^b</u>	<u>< 140 mph, Exposure B or < 130 mph, Exposure C</u>
<u>4</u>	<u>1</u>	<u>1</u>
<u>6</u>	<u>1</u>	<u>2</u>
<u>8</u>	<u>1</u>	<u>2</u>
<u>10</u>	<u>2</u>	<u>3</u>
<u>12</u>	<u>2</u>	<u>3</u>
<u>14</u>	<u>2</u>	<u>3</u>
<u>16</u>	<u>2</u>	<u>4</u>
<u>18</u>	<u>2</u>	<u>4</u>

Table R602.7.5 - Lateral Support for Headers

- Increases the number of king studs in higher wind regions and requires only one or two king studs at each end of a header in regions with 115 mph wind speeds.

Table R602.10.3(4) – Seismic Adjustment Factors

- Clarifies roof and ceiling dead loads in the top story of a multi-story dwelling and an alternative to the BV-WSP (Brick veneer - wood structural panel) bracing method have been added.
- Now allows use of Methods WSP and CS-WSP (continuously sheathed) with brick veneer in the second story of a dwelling.

TABLE R602.10.3(4) Seismic Adjustment Factors to the Required Length of Wall Bracing

Item Number	Adjustment Based On	Story	Condition	Adjustment Factor [Multiply length from table R602.10.3(3) by this factor]	Applicable Methods
5	Roof/ceiling dead load for wall supporting	1-, 2- or 3-story building	≤ 15 psf	1.0	All Methods
		2- or 3-story building	> 15 psf and ≤ 25 psf	1.1	
		1-story building or top story	> 15 psf and ≤ 25 psf	1.2	
7	Walls with stone or masonry veneer, detached one- and two-family dwellings in SDC D _m – D _{sf}	Any story	See Table R602.10.6.5		BV-WSP
8	Walls with stone or masonry veneer, detached one- and two-family dwellings in SDC D _m – D _{sf}	First and second story of two-story dwelling	See Table R602.10.6.5	1.2	WSP, CS-WSP
10	Horizontal blocking	Any story	Horizontal blocking omitted	2.0	WSP, CS-WSP

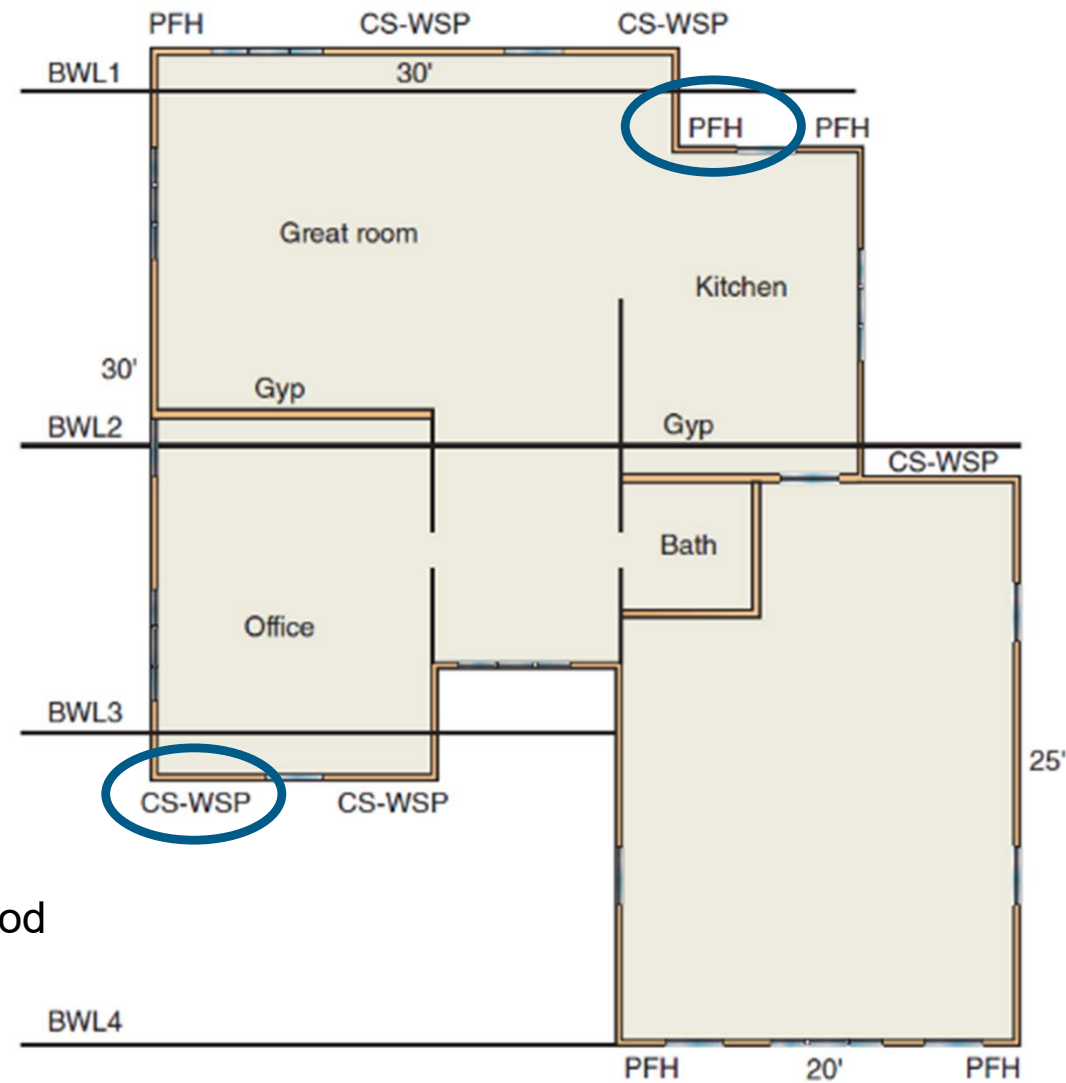
R602.10.4.1

Mixing Bracing Methods

- Mixing of continuous sheathing methods with an intermittent alternate bracing method is clarified.

Example:

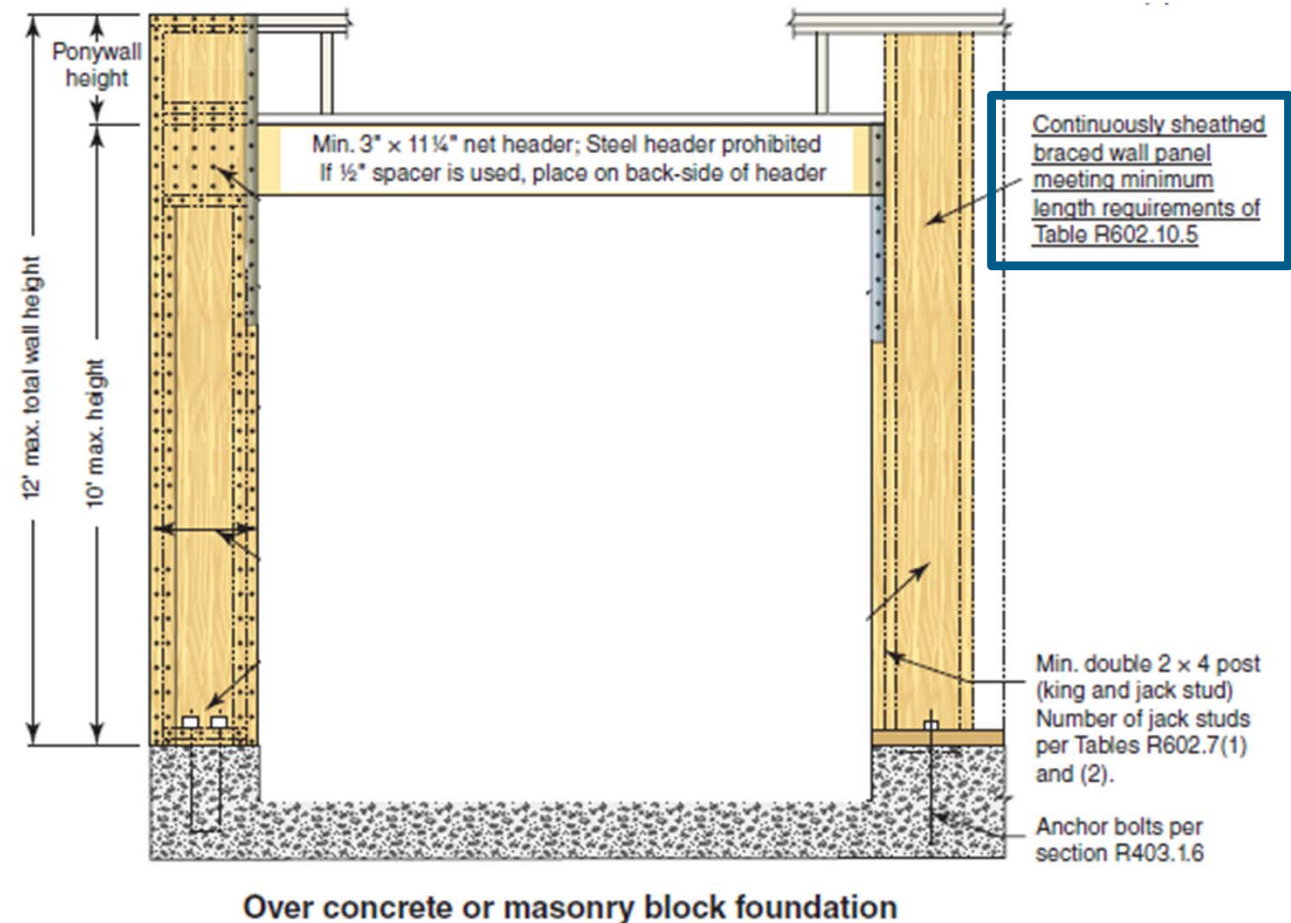
- Portal Frame with Hold-downs (PFH) Method
- Continuous Sheathing—Wood Structural Panel (CS-WSP) Method



Braced wall lines with mixed methods

R602.10.6.4 – Method CS-PF (Continuously-Sheathed Portal Frame)

- Clarifies sheathing as part of a BWP (Braced Wall Panel) on the post end of a portal frame



Method CS-PF—Continuously Sheathed Portal Frame Panel Construction

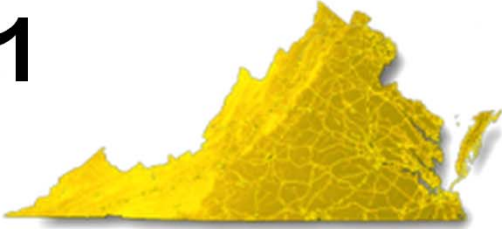
Tables R603.3.1 and R603.3.1.1(2)

Cold-Formed Steel Wall Construction

- Aligns with related change in Chapter 5 floors
- Updated to be consistent with the 2015 AISI S230 Standard for *Cold-Formed Steel Framing-Prescriptive Method for One- and Two-Family Dwellings*.
- Maximum joist spans are updated for wind speeds up to 140 mph



R609.4.1



Garage door labeling

- From the Resiliency subgroup
- Requires garage doors to have a permanent label from manufacturer with design criteria (for benefit of homeowner)



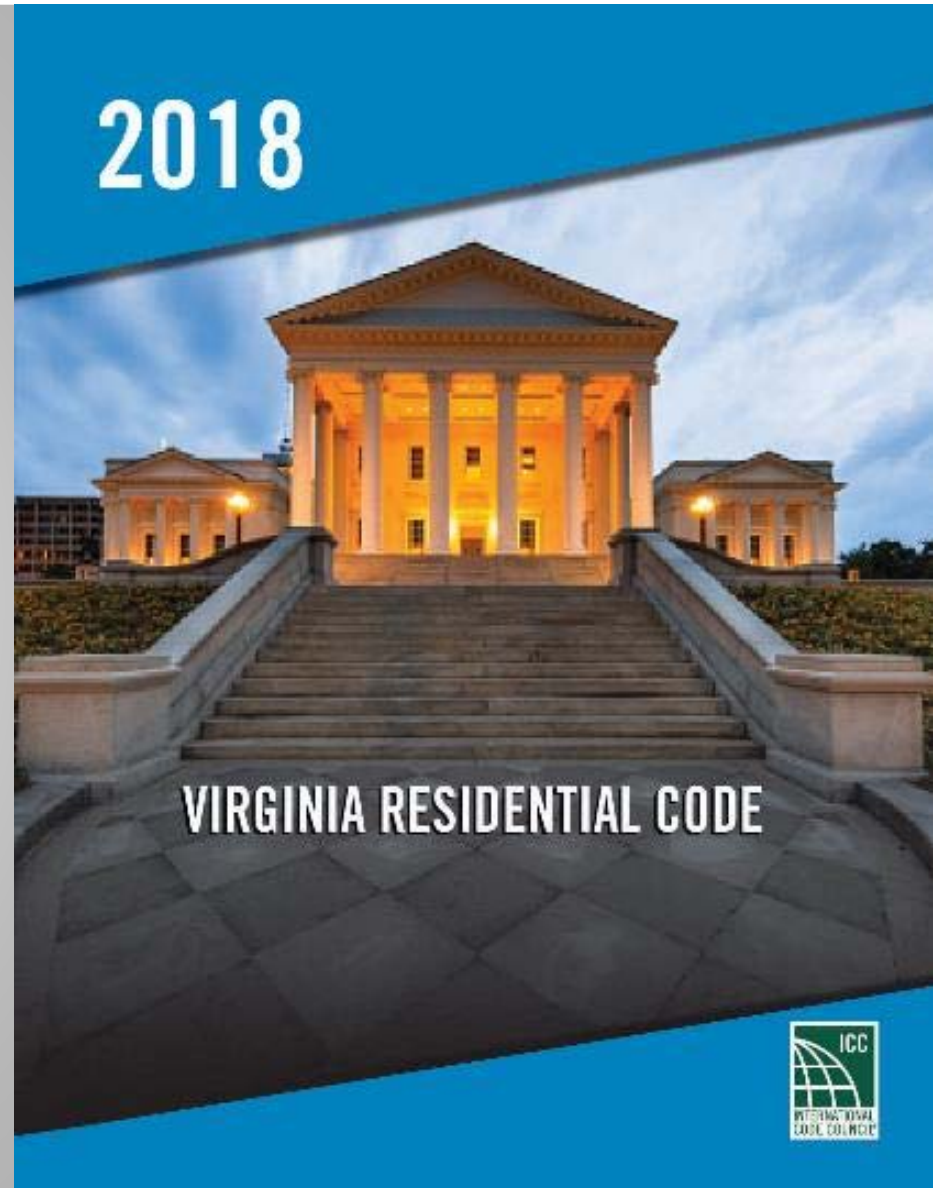


R610 - Structural Insulated Panels (SIPS) – Section Reorganized

- Information on facers, core, and adhesive requirements are now located in ANSI / APA PRS 610.1 and deleted from the IRC/VRC.

Chapter 7

Wall Covering



R703.2

Water-Resistive Barrier

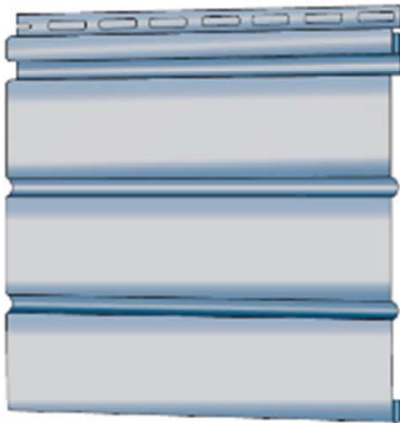
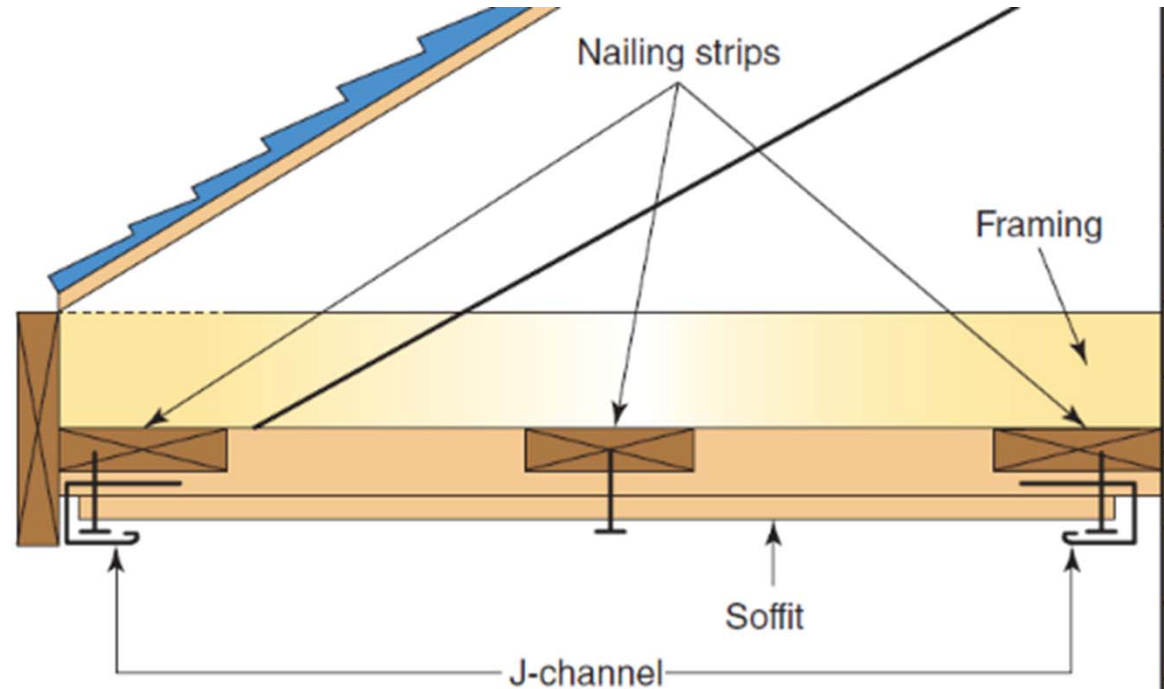
- Water-resistive barrier materials other than No.15 asphalt felt must be installed following the manufacturer's installation instructions.
- The exemption for detached accessory buildings is deleted.



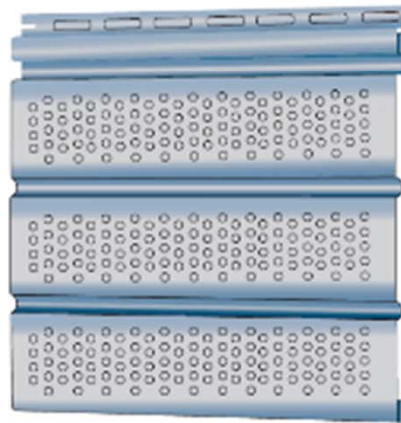
R703.3.1

Soffit Installation

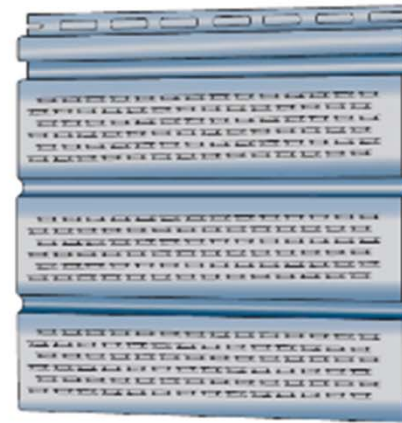
- Requirements for wood structural panel soffits are added to Section R703.3.1 and vinyl soffit requirements are clarified.



Solid



Vented perforated



Vented basketweave

R703.8.4

Veneer Anchorage through Insulation

- Masonry veneer is explicitly allowed to attach through insulation into the underlying wood structural panels (WSP).
- Attachment must follow Table R703.8.4(2).

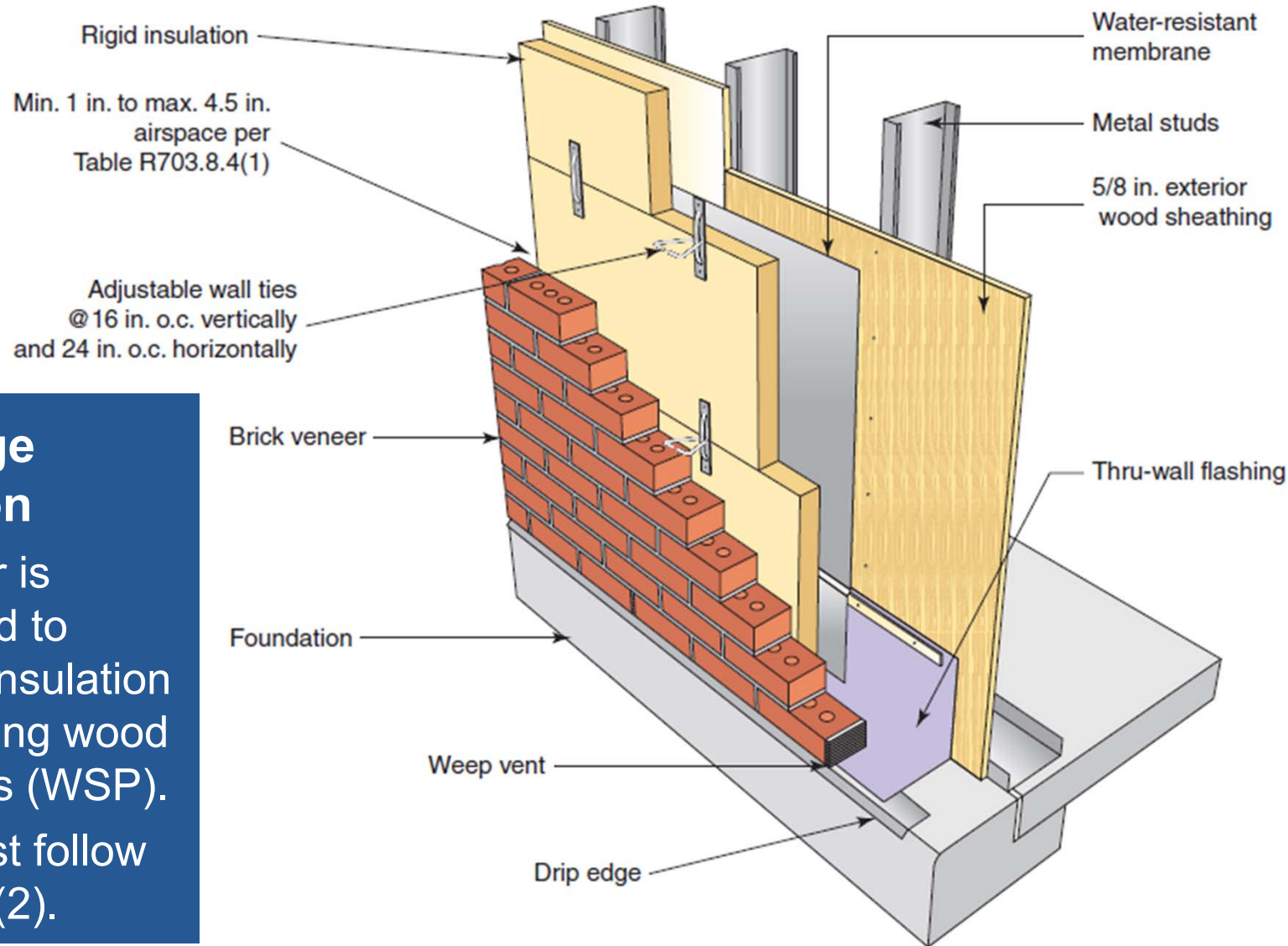
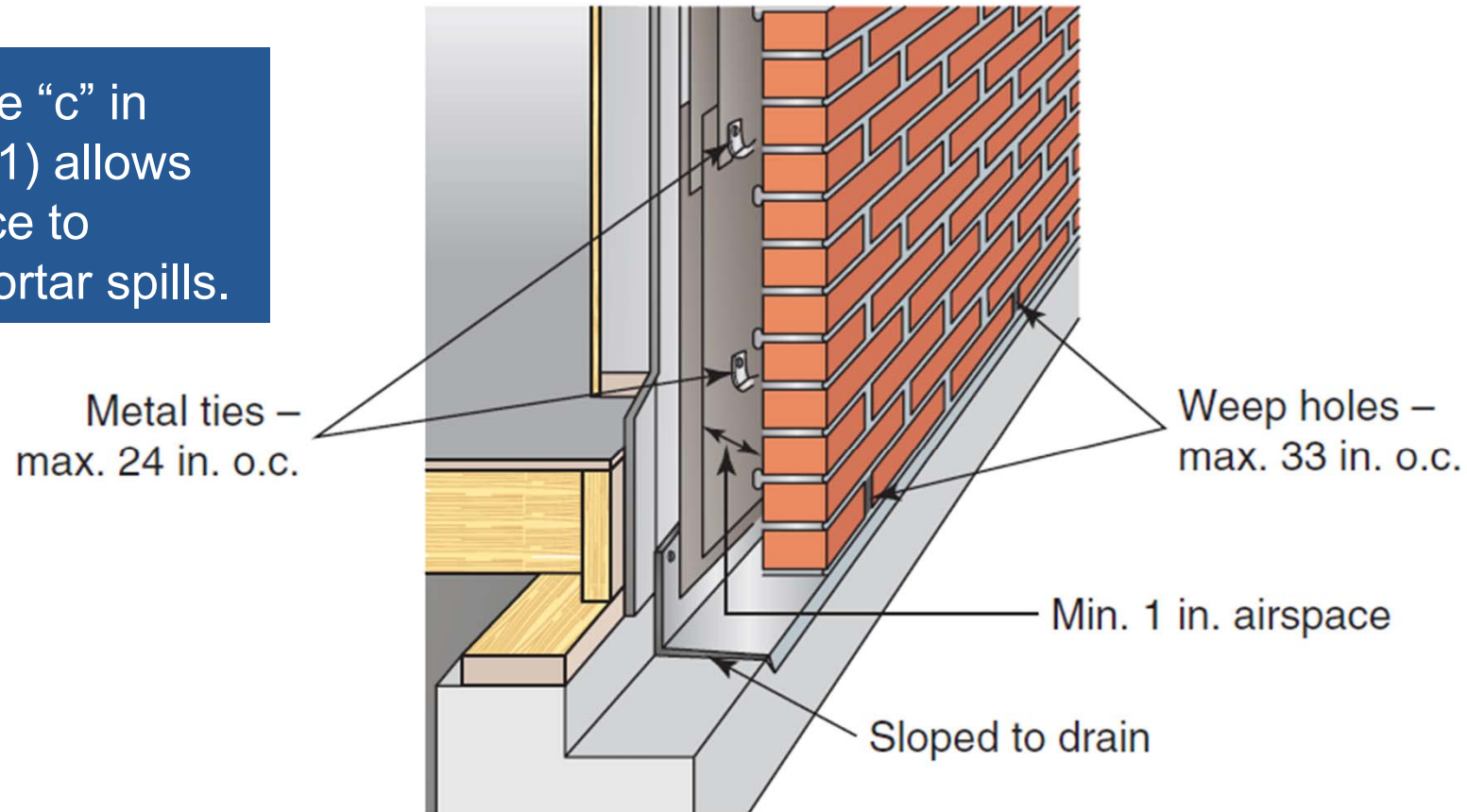


Table R703.8.4(1) – Airspace Requirements

The new footnote “c” in Table R703.8.4(1) allows drainage airspace to contain some mortar spills.



Drainage airspace behind veneer

Table R703.11.2

Vinyl Siding Installation Over Foam Plastic Sheathing

- New Table R703.11.2 gives design wind pressures for vinyl siding resisting all wind loads without reliance on wood structural panel sheathing below.

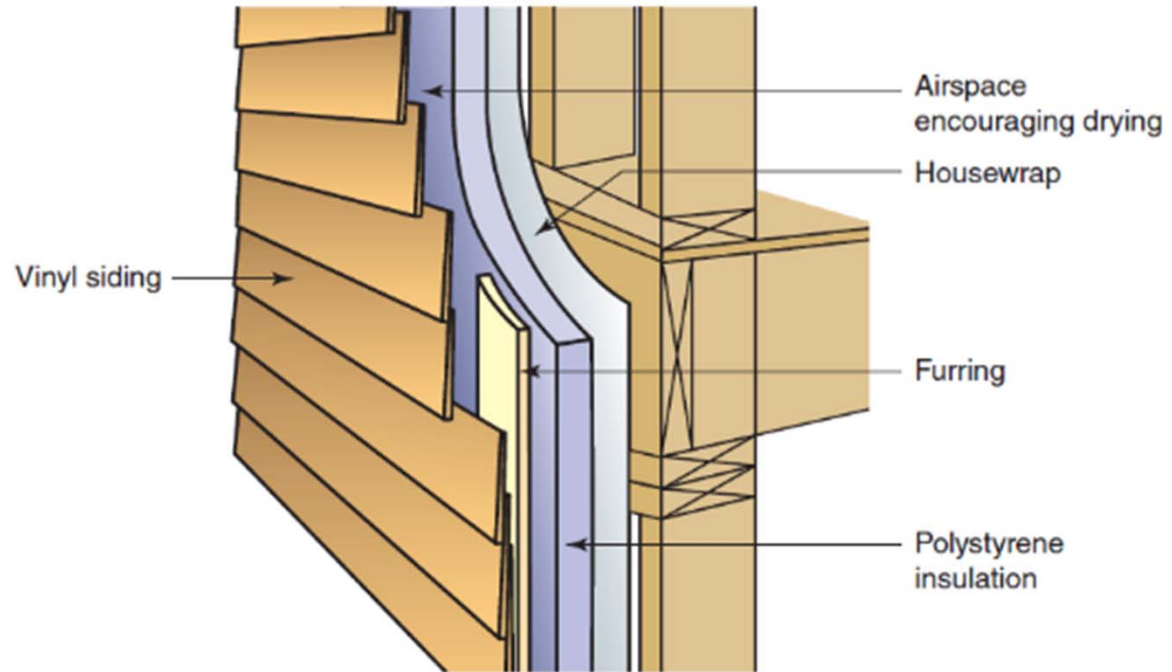


TABLE R703.11.2 Adjusted Minimum Design Wind Pressure Requirement for Vinyl Siding

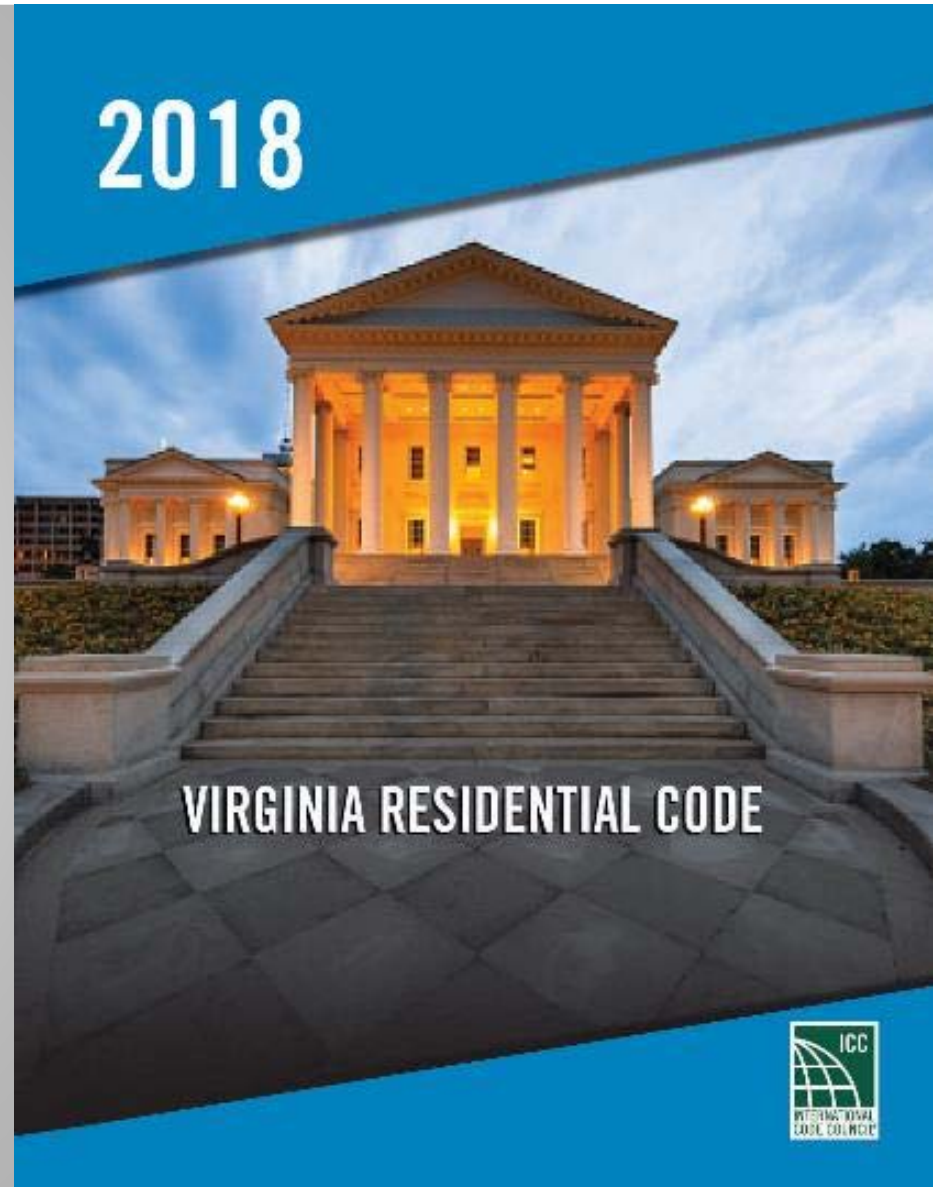
Ultimate Design Wind Speed (mph)	Adjusted Minimum Design Wind Pressure (ASD) (psf) ^{a,b}					
	Case 1: With interior gypsum wallboard ^c			Case 2: Without interior gypsum wallboard ^c		
	Exposure			Exposure		
	B	C	D	B	C	D
110	-44.0	-61.6	-73.1	-62.9	-88.1	-104.4
115	-49.2	-68.9	-81.7	-70.3	-98.4	-116.7
120	-51.8	-72.5	-86.0	-74.0	-103.6	-122.8
130	-62.2	-87.0	-103.2	-88.8	-124.3	-147.4
≥130	Not Allowed ^d					

Chapters 8, 9, & 10

**Roof-Ceiling
Construction**

Roof Assemblies

**Chimneys and
Fireplaces**



R802 – Roof Framing

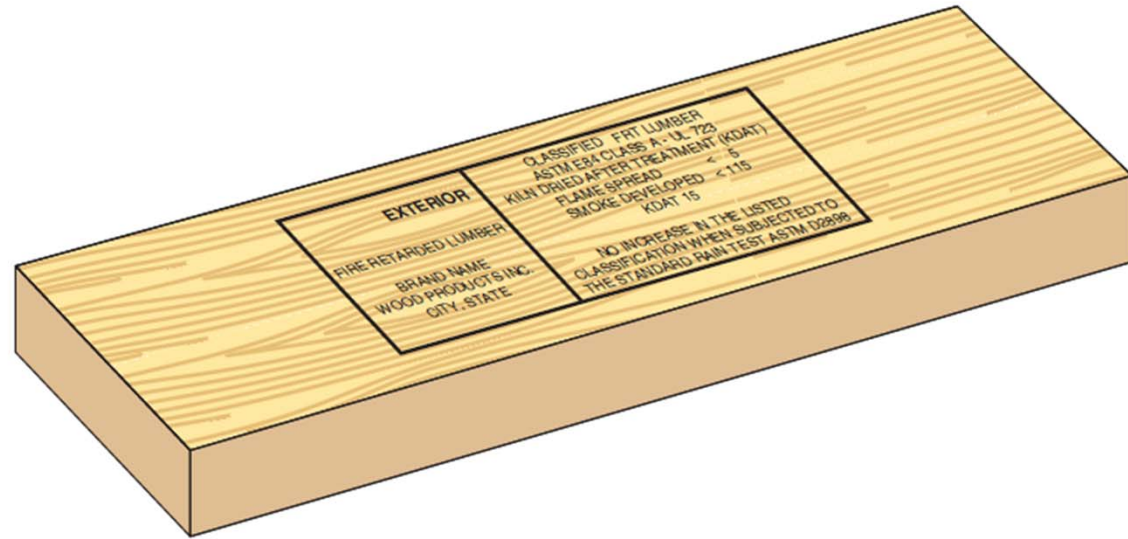
- Section R802, design and construction of roofs, has been clarified by dividing the content into three separate sections on roof ridges, rafters and ceiling joists.



R802.1.5.4

Labeling

- Each piece of fire-retardant-treated (FRT) lumber and each FRT wood structural panel require a label with eight specific items of information.



Fire-retardant treated lumber

BRAND NAME TREATED WOOD PRODUCTS INC. (PLANT LOCATION)	CLASSIFIED UL TREATED PLYWOOD 17/PO R7003
ESR-XXXX MONITORED BY TIMBER PRODUCTS INSPECTION STD. 2200P KDAT AA-696	SPECIES SURFACE BURNING CHARACTERISTICS FLAMESPREAD: SMOKE DEVELOPED: 30 MINUTE TEST

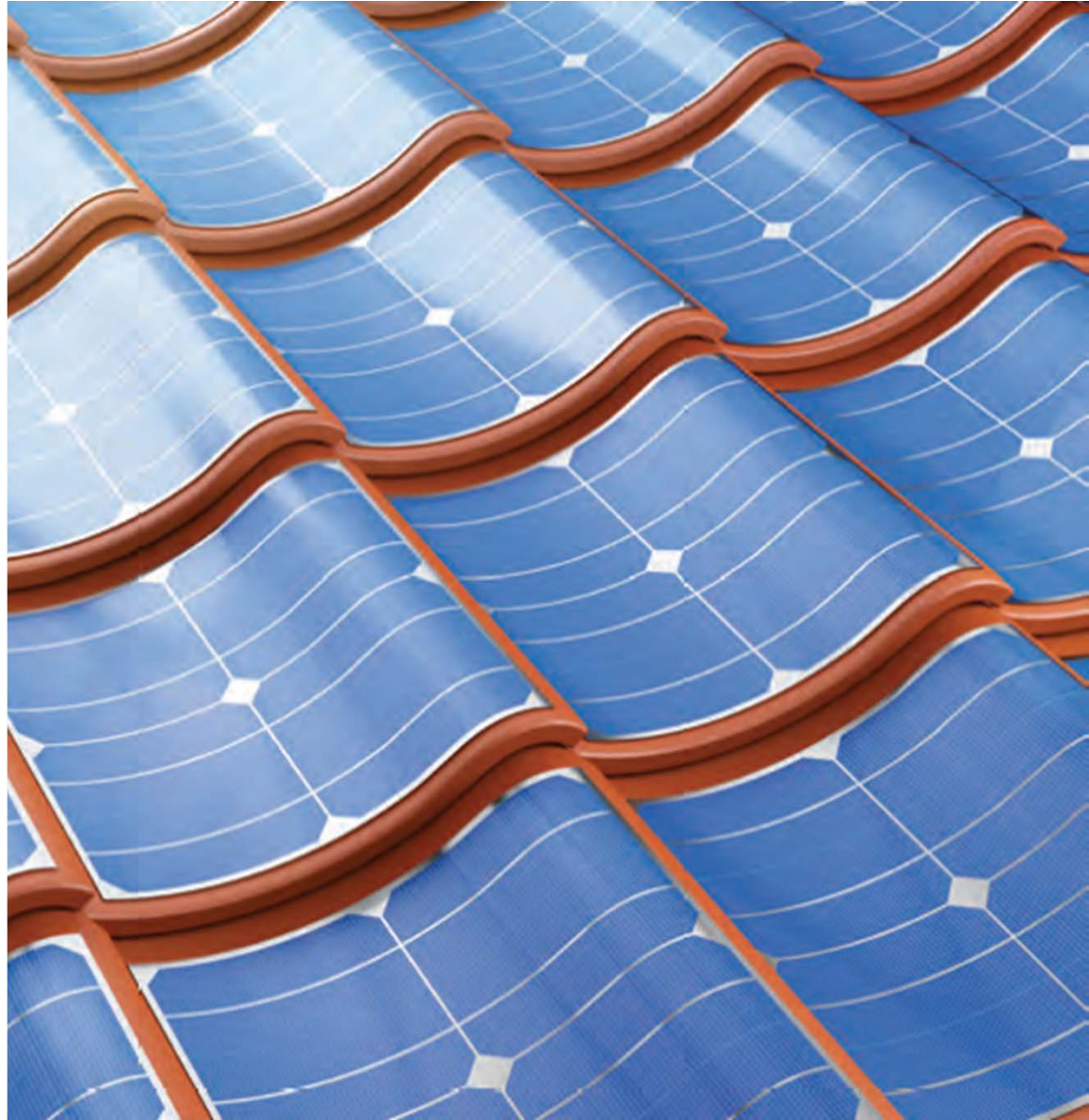
© International Code Council

FRT plywood

Tables R905.1.1(1) and R905.1.1(2)

Underlayment Requirements for Photovoltaic Shingles

- Underlayment requirements for photovoltaic (PV) shingles are revised for consistency with other roofing materials and moved to the Tables R905.1.1(1) and R905.1.1(2) for underlayment.



R905.17 – Building-Integrated Photovoltaic Panel

New section and definition to address the installation and attachment of **(BIPV) roof panels**

[RB] BUILDING-INTEGRATED PHOTOVOLTAIC ROOF PANEL (BIPV Roof Panel). A photovoltaic panel that functions as a component of the building envelope.

R1005.8

Chimney Insulation Shield

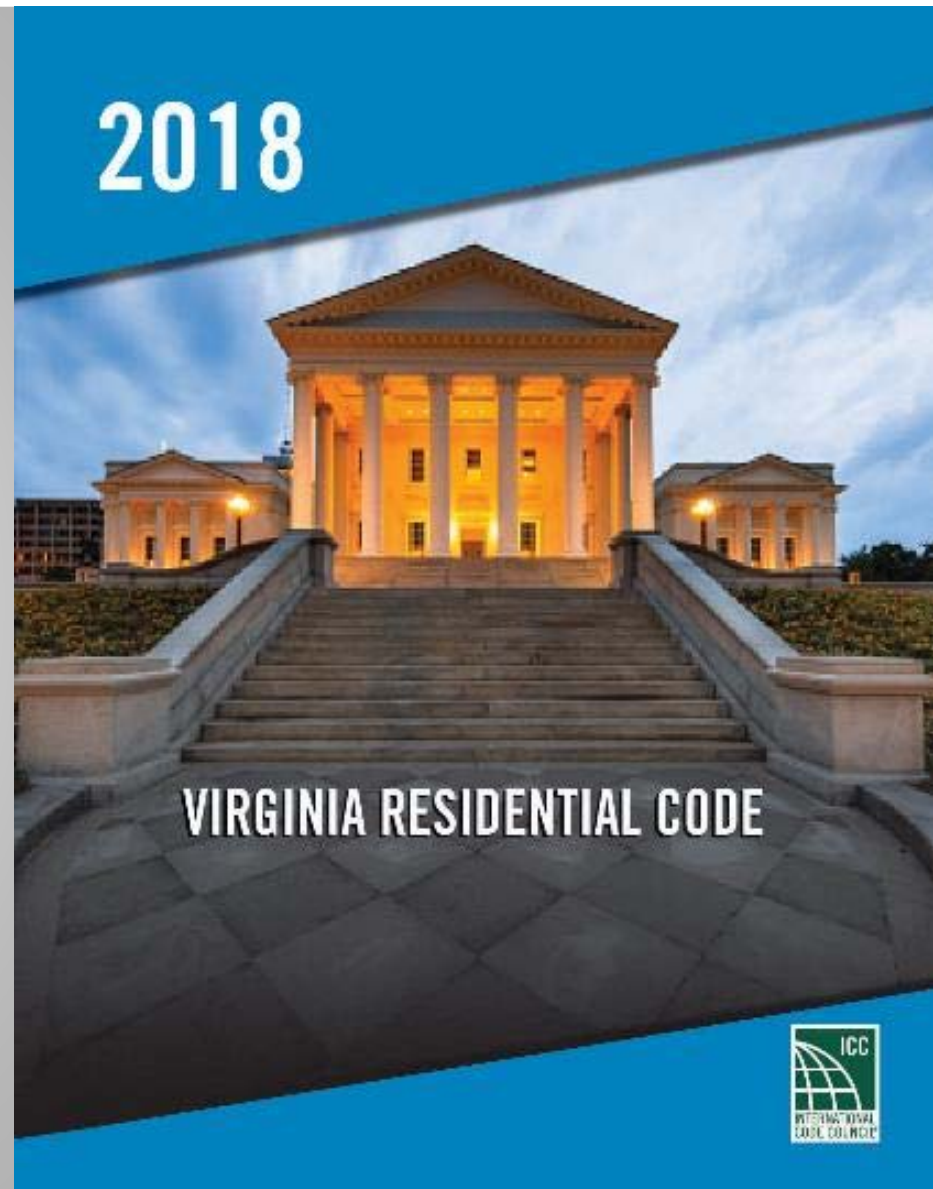
- Factory-built chimneys are **now required to have an insulation shield** to provide the required minimum clearance to insulation.



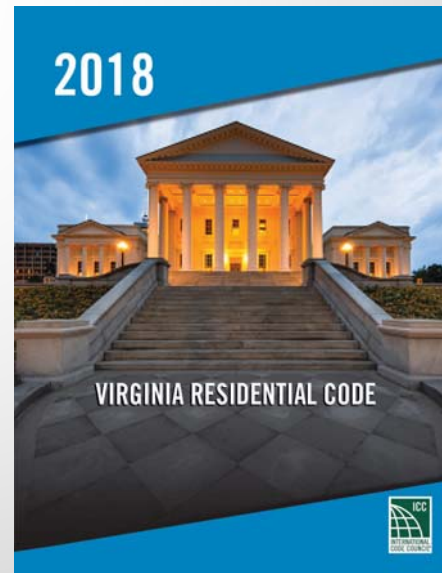
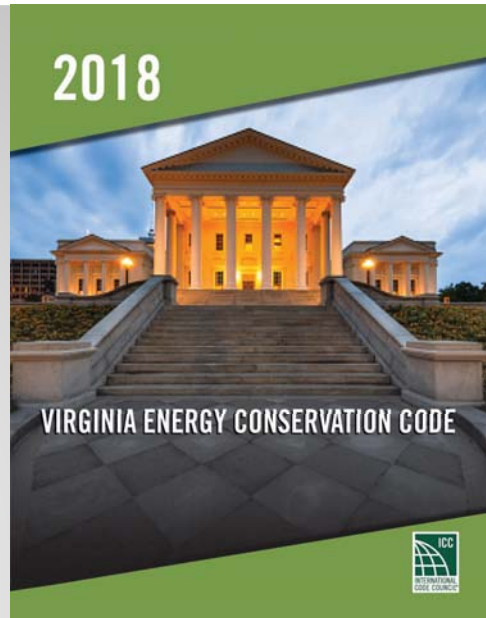
Insulation Shield

What questions
do you have?

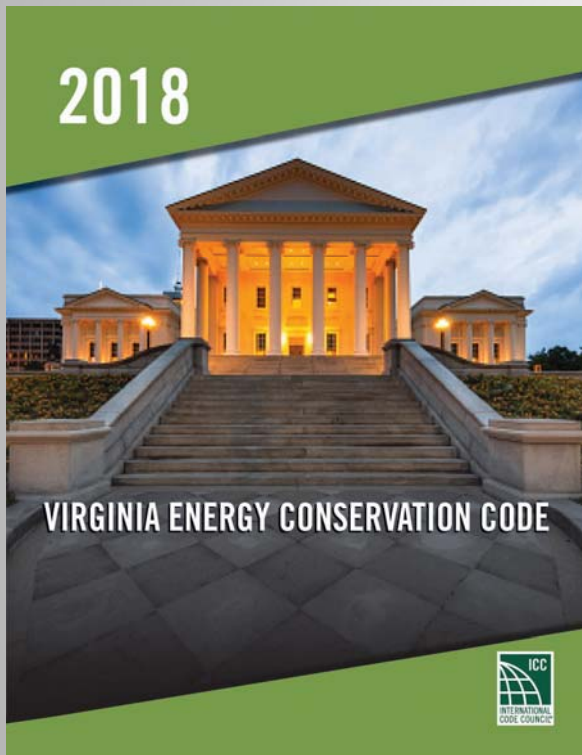
Skill Check 3



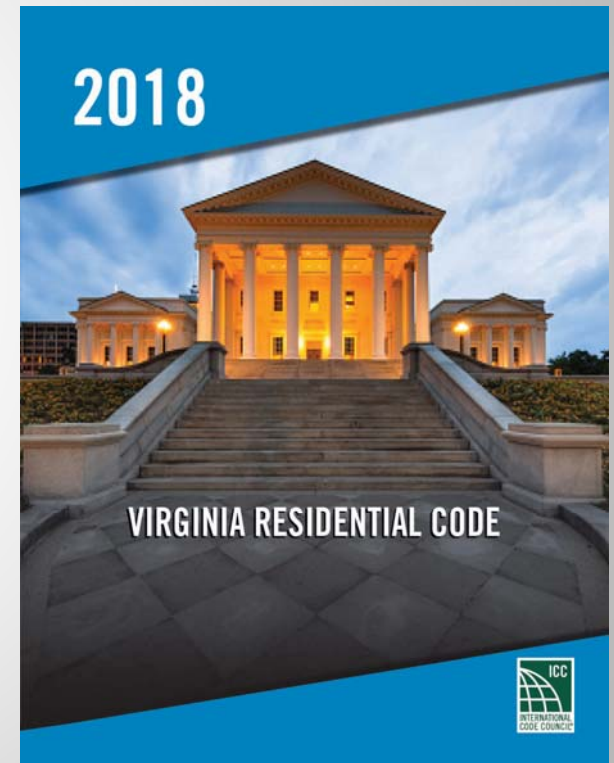
VRC Chapter 11 (Virginia Energy Conservation Code [R] - Residential Provisions)



VECC Residential Provisions are Cross-listed with the Corresponding VRC Section



R401 / N1101





R202/N1101.6 Air barrier

- Definition of "air barrier" updated
- Definition of "continuous air barrier" remains in the code

R401.2/N1101.13 Compliance

- Allows the use of REScheck keyed to the 2018 IECC
- VA multiplier removed from text, and resource is no longer available; default value acknowledged





Insulation Rating		R-Value
Ceiling / Roof		38.00
Wall		19.00
Floor / Foundation		19.00
Ductwork (unconditioned spaces):		_____

Glass & Door Rating		U-Factor	SHGC
Window		0.45	0.35
Door		0.40	0.25

Heating & Cooling Equipment		Efficiency
Heating System:	_____	_____
Cooling System:	_____	_____
Water Heater:	_____	_____

Name: _____ Date: _____

Comments: _____

R401.3/N1101.14 Certificate

- Permanent certificate listing the predominant R-value, the U-factors and SHGC to be posted.

State Code Change



R402.1/N1102.1 Building Thermal Envelope for Log Homes

- New standard ICC 400 added as compliance path for log homes

Table R402.1.2 Insulation and Fenestration Requirements by Component

- Fenestration U-factor updated to 0.32

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^{b, c}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^c WALL R-VALUE
4 except Marine	0.32	0.55	0.40	49	15 or 13 + 1 ^h	8/13	19	10 /13	10, 2 ft	10/13

Tables R402.1.2 /N1102.1.2 and R402.1.4/N1102.1.4 Insulation & Fenestration Requirements by Component

- Ceiling insulation values increased from R-38 to R-49, meeting the 2018 IECC

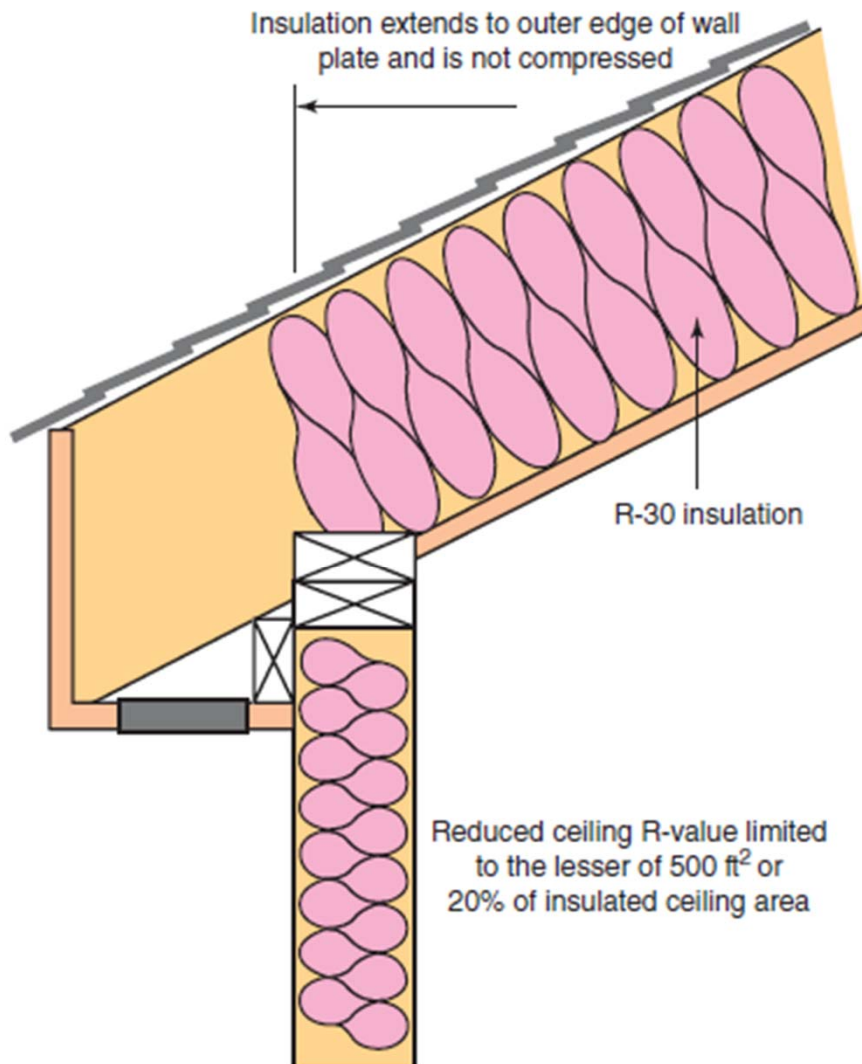


State Code Change

R402.1.4.2/N1102.4.1.2, R402.4.1.3/N1102.4.1.3 Testing

- The visual inspection of thermal envelope tightness is no longer an option in lieu of blower door testing.



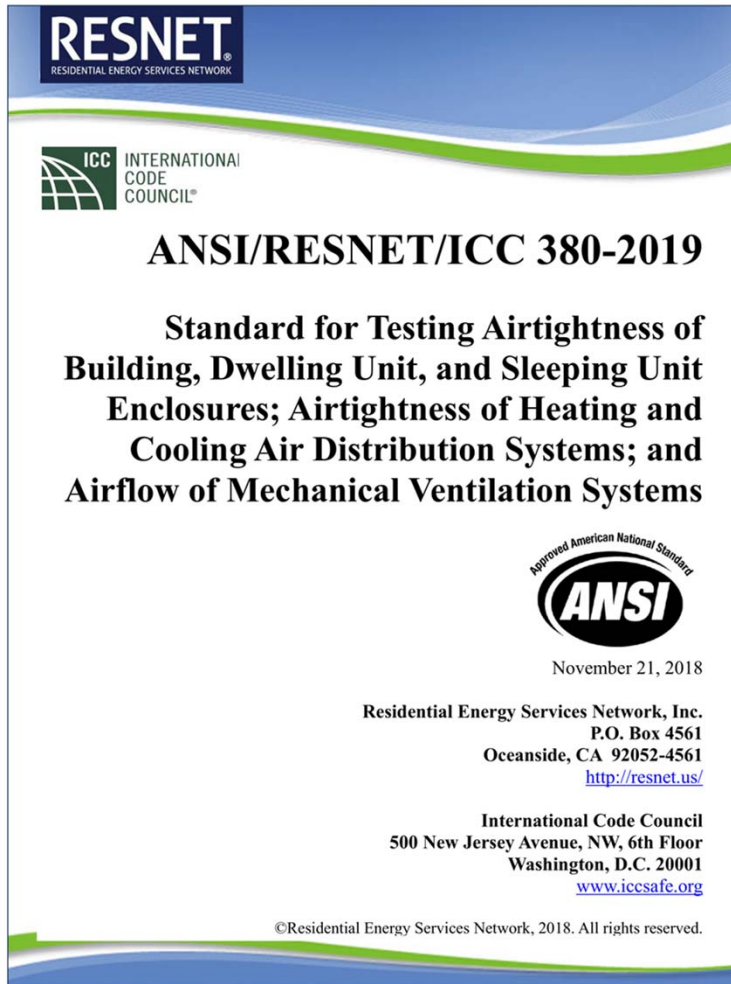


Reduced R-value for vaulted ceiling

© International Code Council

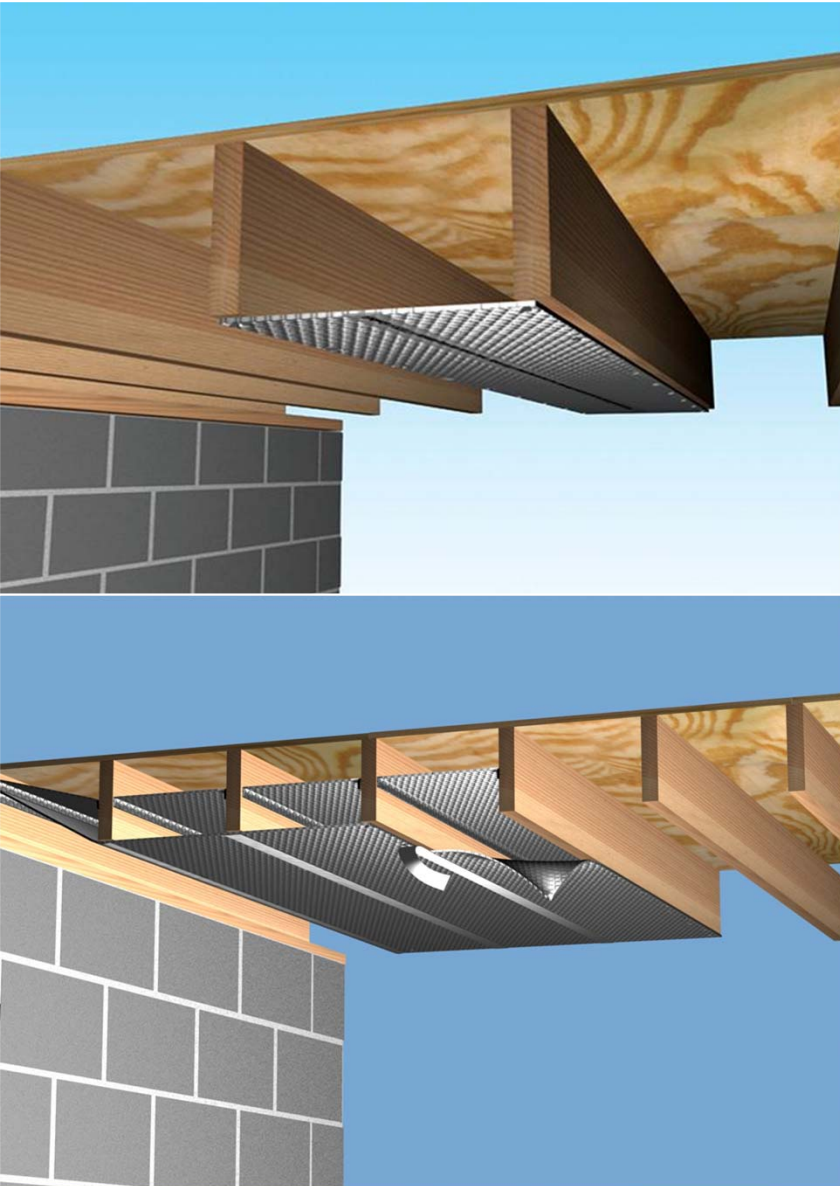
R402.2.2/ N1102.2.2 Reduction of Ceiling Insulation

- Insulation must extend over top plate in certain ceilings without attic spaces



R402.4.1.2/N1102.4.1.2 Testing for Air Leakage

- New standard for testing air leakage
- RESNET/ICC 380



R403.3.5/N1103.3.5 Building Cavities

- Section deleted
- Removes conflict between energy and mechanical provisions
- Building framing cavities allowed to be used as plenums when meeting M1601.1.1 #7

State Code Change

R403.3.6/N1103.3.6, R403.3.7/N1103.3.7 Ducts Buried Within Ceiling Insulation

- New section provides requirements for ducts buried within ceiling insulation
- Additional section for deeply buried ducts when using the simulated performance compliance method



R404.1/N1104.1 Lighting

- Percentage of lamps required to be high efficacy increased from 75% to 90%.



Chapter 5 Existing buildings



- Chapter 5 brought into alignment with VEBC.



R501/N1107 General

- Now points reader to VEBC for administration of existing building energy provisions.



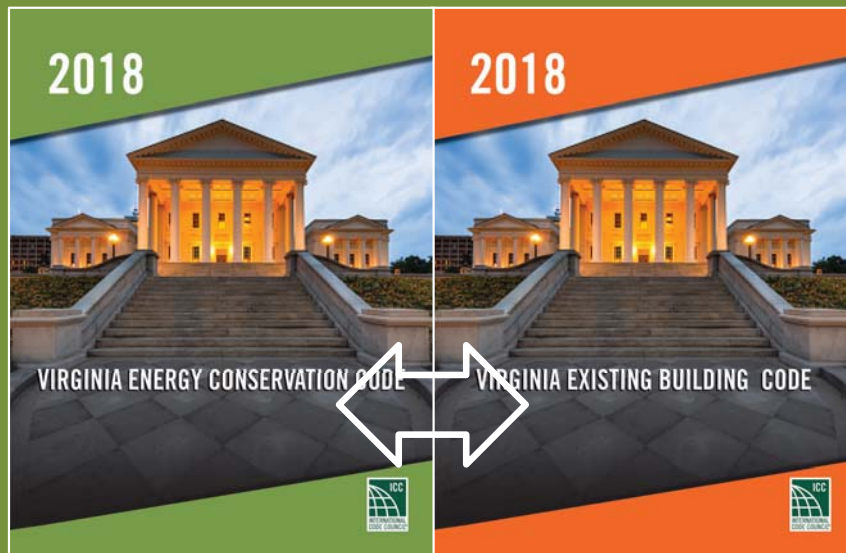
R502/N1108 Additions



- Relocation of energy provisions applicable to building additions from the VECC to the VEBC.

State Code Change

R503/N1109 Alterations



- Relocation of energy provisions applicable to building alterations from the VECC to the VEBC.



R504/N1110 Repairs

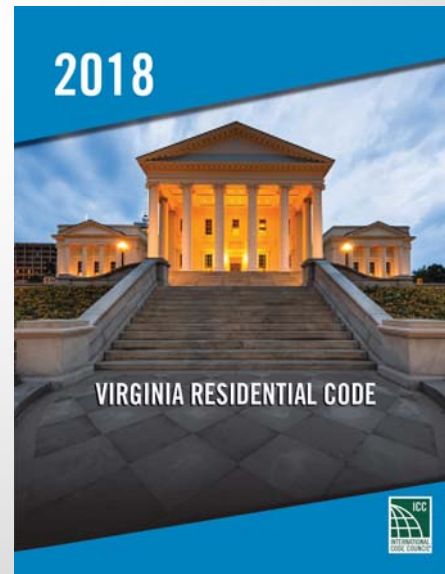
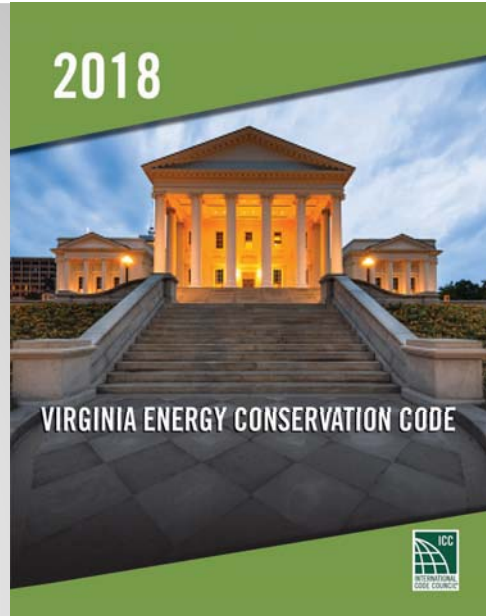
- Relocation of energy provisions applicable to building repairs from the VECC to the VEBC.



State Code Change

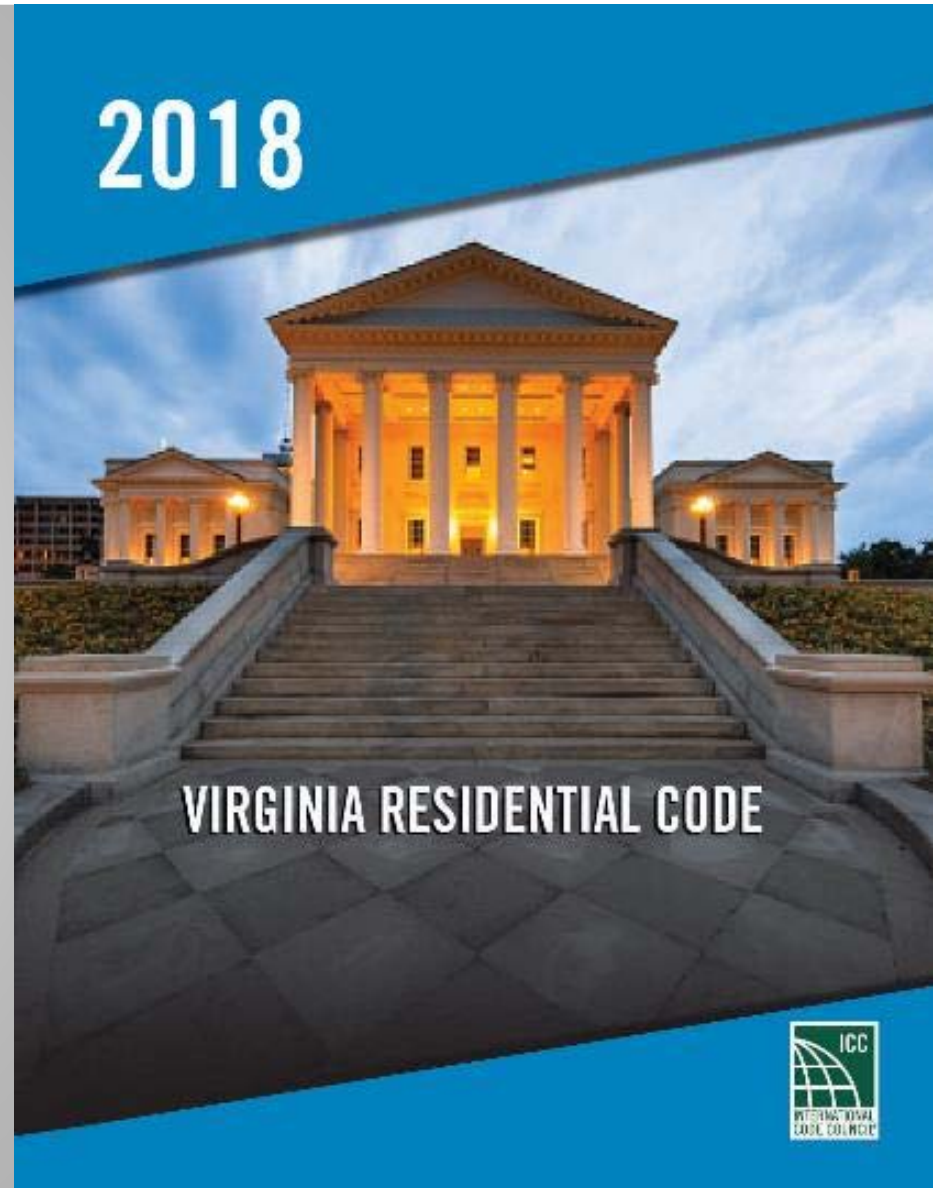
What questions do you have?

Skill Check 3e - Energy



Chapters 13 - 23

Mechanical

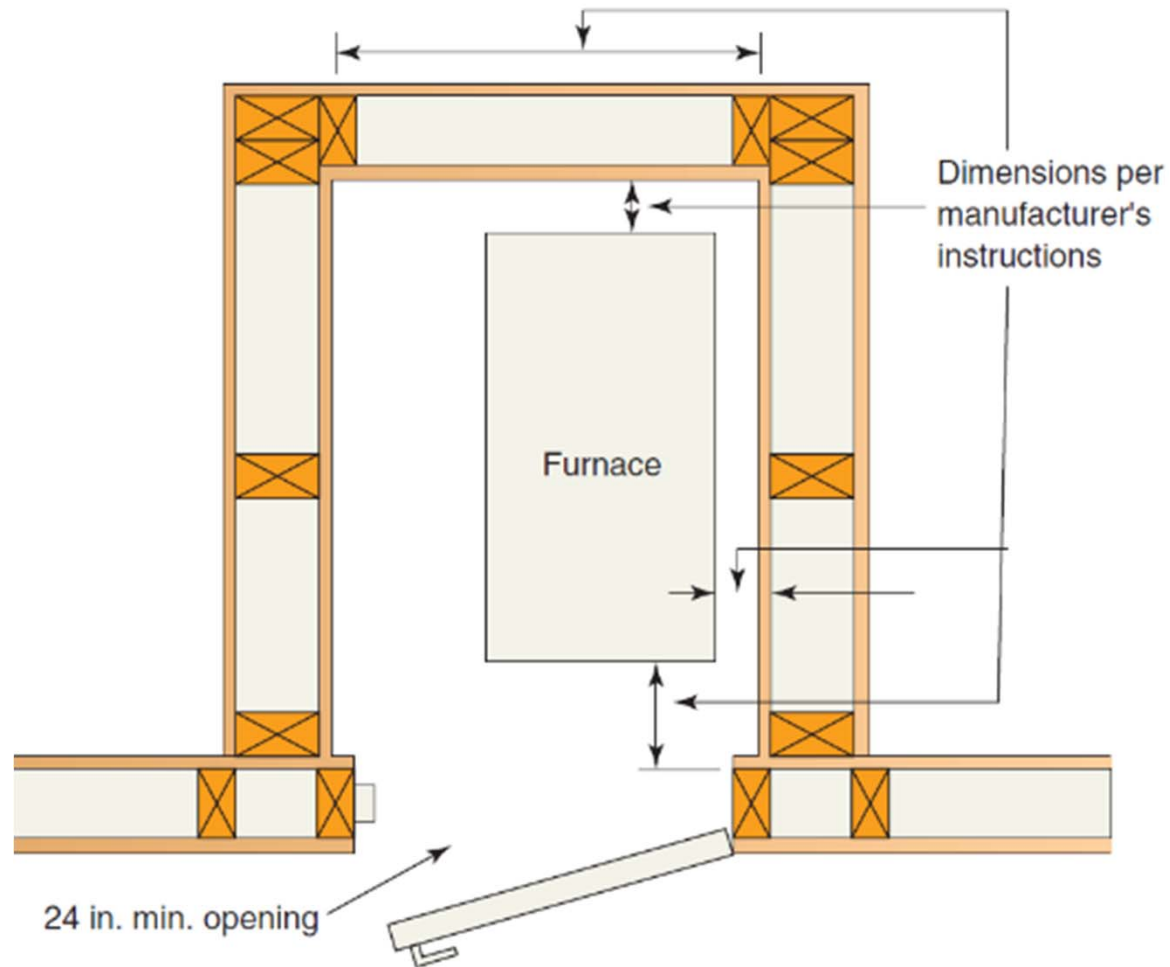


~~M1305.1.1~~

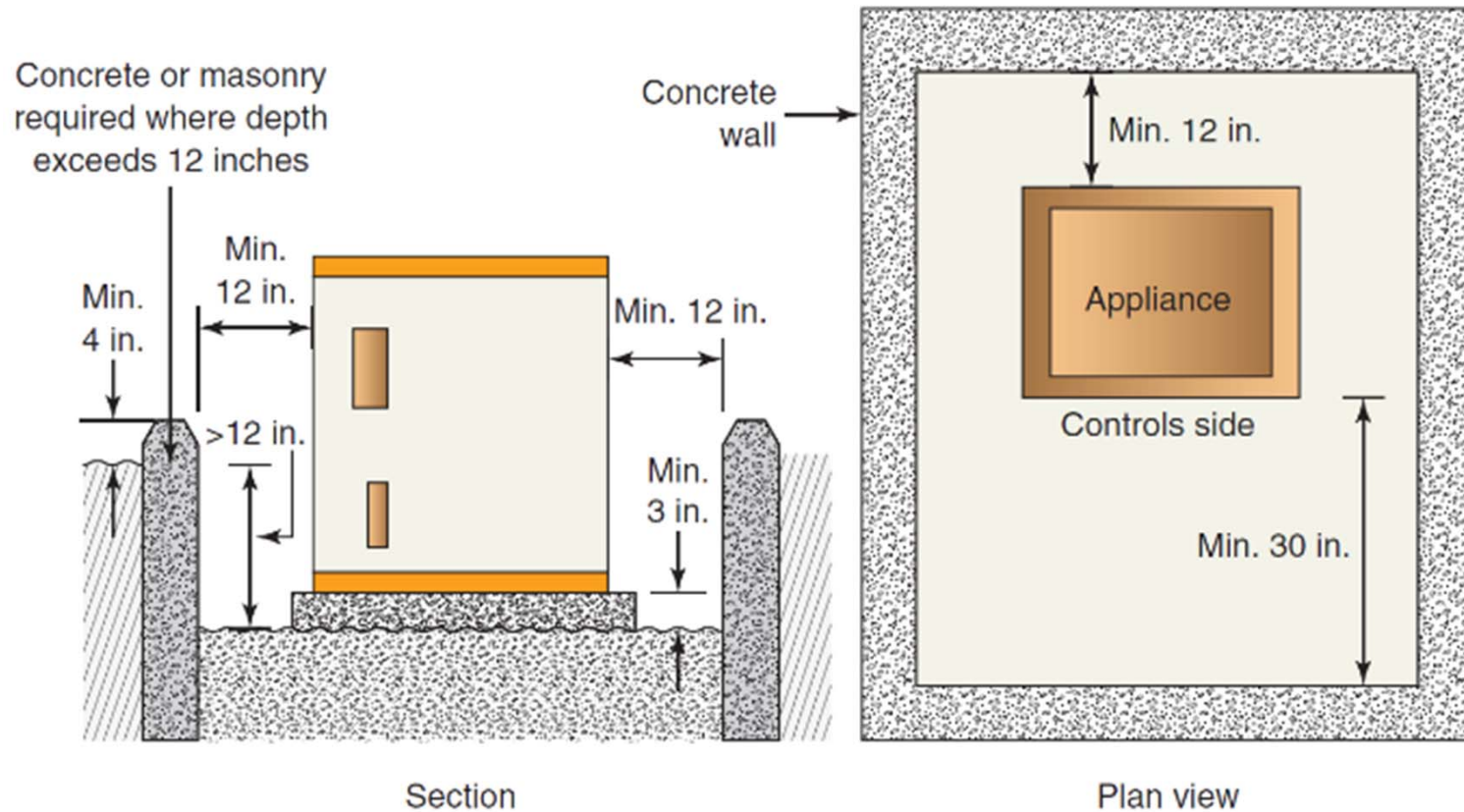


~~Access to Furnaces Within Compartments~~

- The appliance access and clearance requirements for furnaces in compartments have been removed in favor of other code provisions and the manufacturer's instructions.



The access and clearance requirements for furnaces in compartments have been removed in favor of the manufacturer's instructions.



M1305.1.3.2 - Appliances Installed in Pits

- Requirements are expanded to provide more detail and to be more consistent with the Mechanical and Fuel Gas codes.
- The minimum bottom clearance has been reduced from 6" to 3".

M1502.4.2 (VMC 504.4.1)

(1 of 2)

Clothes Dryer Exhaust Termination and Passageway Size

- Until now, the code did not specifically address the vent termination itself.
- Some types of vent termination assemblies produce excessive amounts of backpressure



Example:

- This 4" gooseneck type vent produces .7 inches water column (wci) of backpressure differential (.27 to .97).
- **This is 3.5 elbows worth of added backpressure**

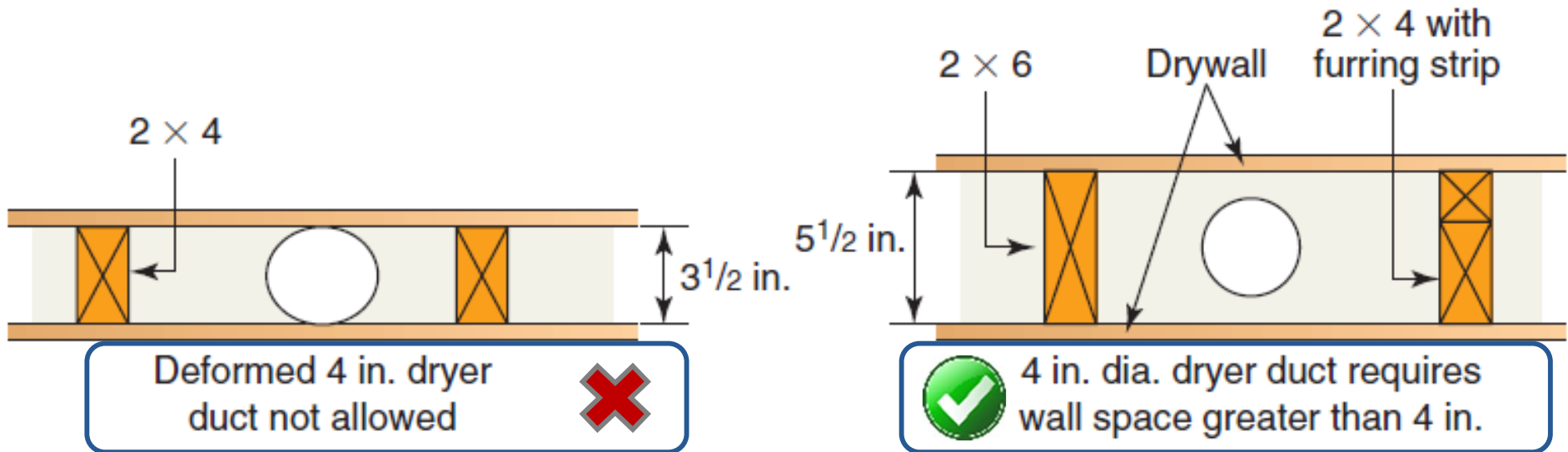
M1502.4.2 (VMC 504.4.1)

(2 of 2)

Clothes Dryer Exhaust Termination and Passageway Size

New section requires that these terminals be **“undiminished in size, and provide an open area of not less than 12.5 square inches”** (4” round duct equivalent)





Plan view

© International Code Council

M1502.4.2 /VMC 504.8.2, VFGC 614.8.2 - Concealed Dryer Exhaust Ducts

- Ceiling and wall cavities enclosing dryer ducts must provide sufficient space that the 4-inch duct is not squeezed out of its round shape (deformed).
- (VA continues to modify this section to not allow fastener penetrations into the duct)

M1503

~~Range Hoods Domestic~~ Cooking Exhaust Equipment

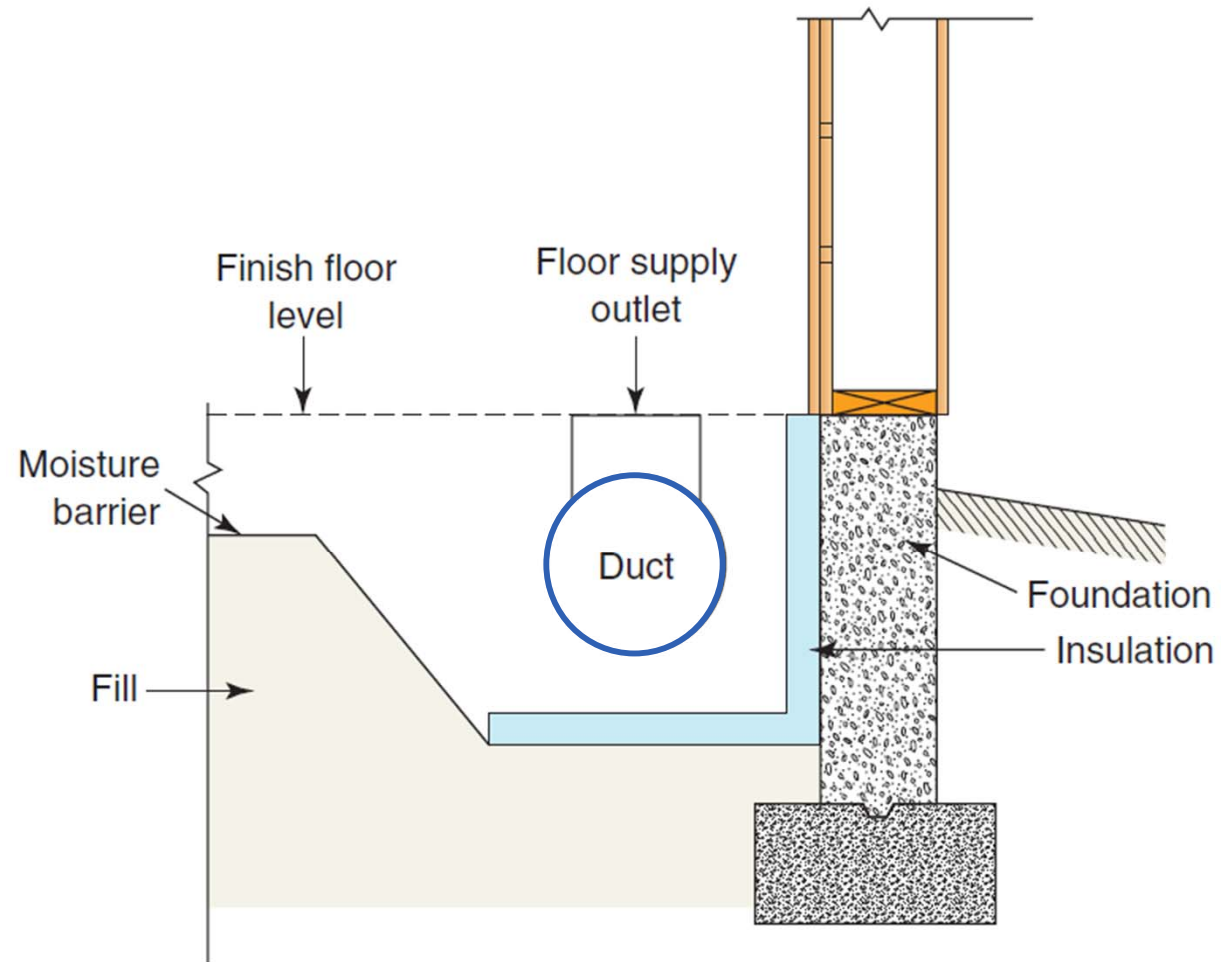
- Section renamed to reflect preferred terminology
- Section is reorganized and other related requirements are moved into this section
- Sections 1504 – Installation of Microwave Ovens - and 1505 - Open-top broiler exhaust – are moved into this section



M1601.1.2

Underground Duct Systems

- Underground ducts, including both direct-burial ducts and those encased in concrete, require sealing and testing.



Underground ducts require sealing and testing prior to encasement or backfill.

M1901

Ranges and Ovens

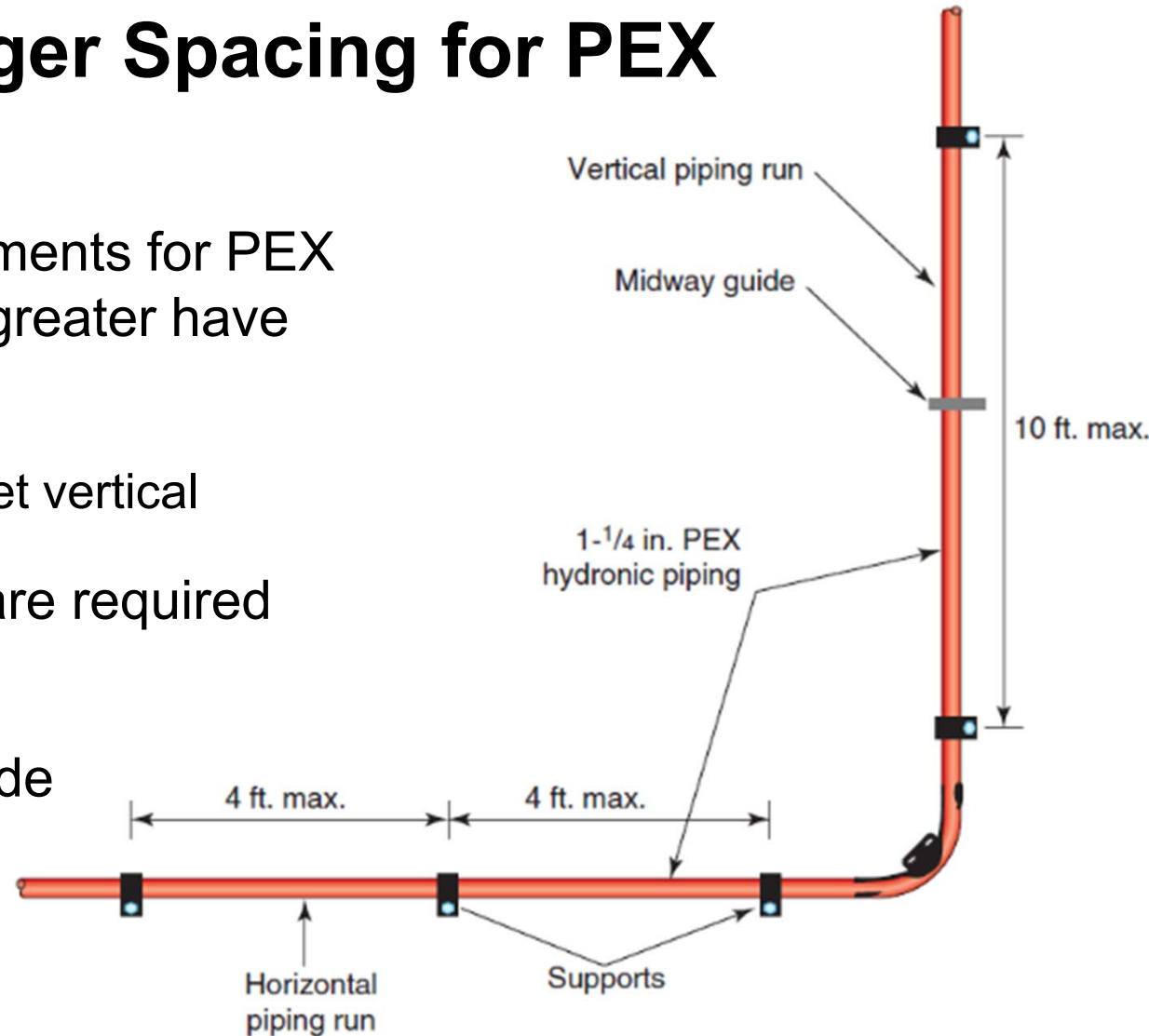
- The provisions for reduced clearances above cooking surfaces have been clarified.
- The listing requirement (UL923) for microwave ovens has also been added.



Microwave oven with integral exhaust requires clearance above a cooking surface in accordance with its listing and labeling.

Table M2101.9 – Hanger Spacing for PEX

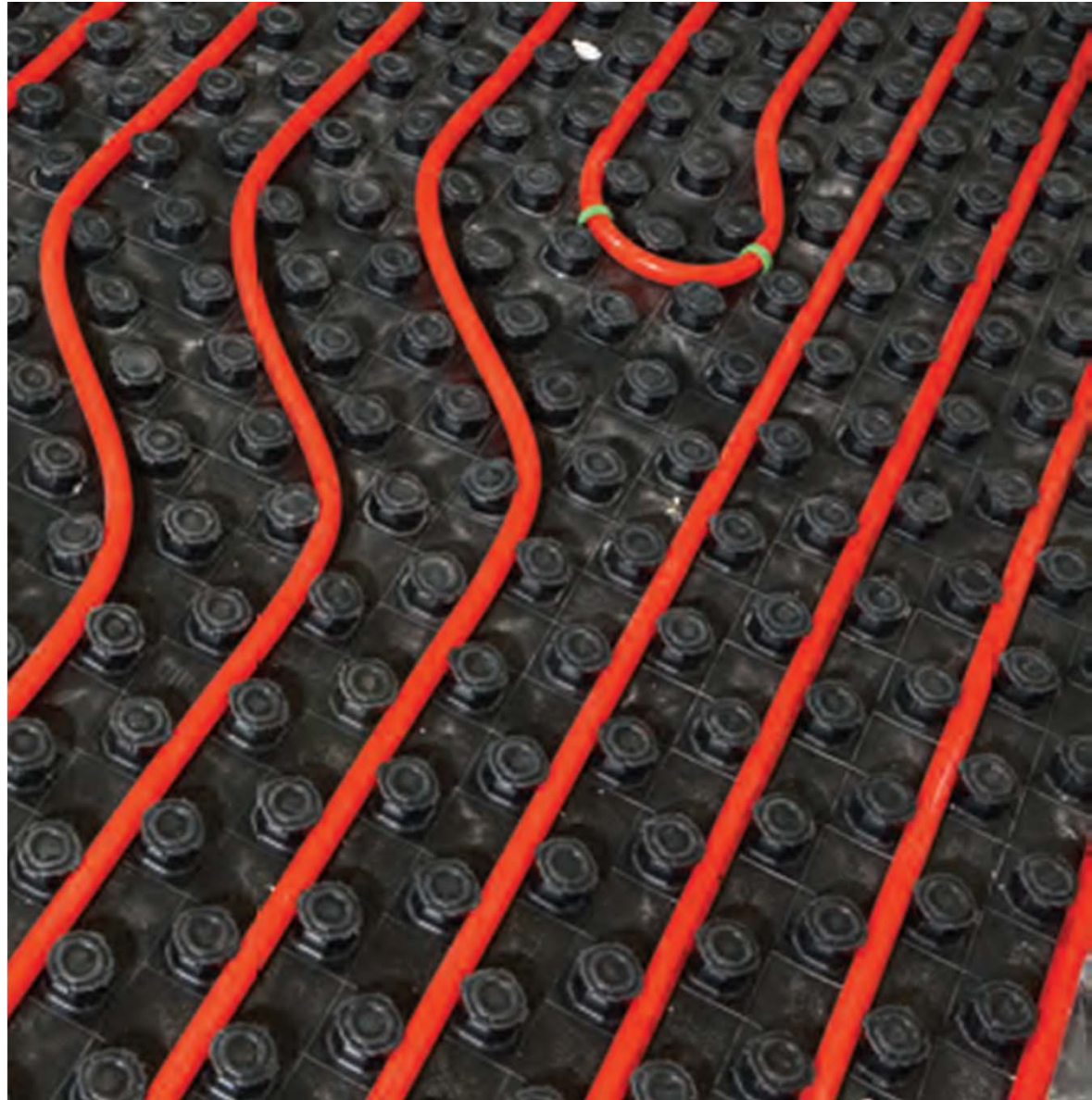
- Support spacing requirements for PEX tubing 1¼ inch dia. and greater have been added.
 - 4 feet horizontal, 10 feet vertical
- Vertical midway guides are required per footnote a.
- Aligns with Plumbing Code



M2101.10

Pressure Tests for PEX Hydronic Piping

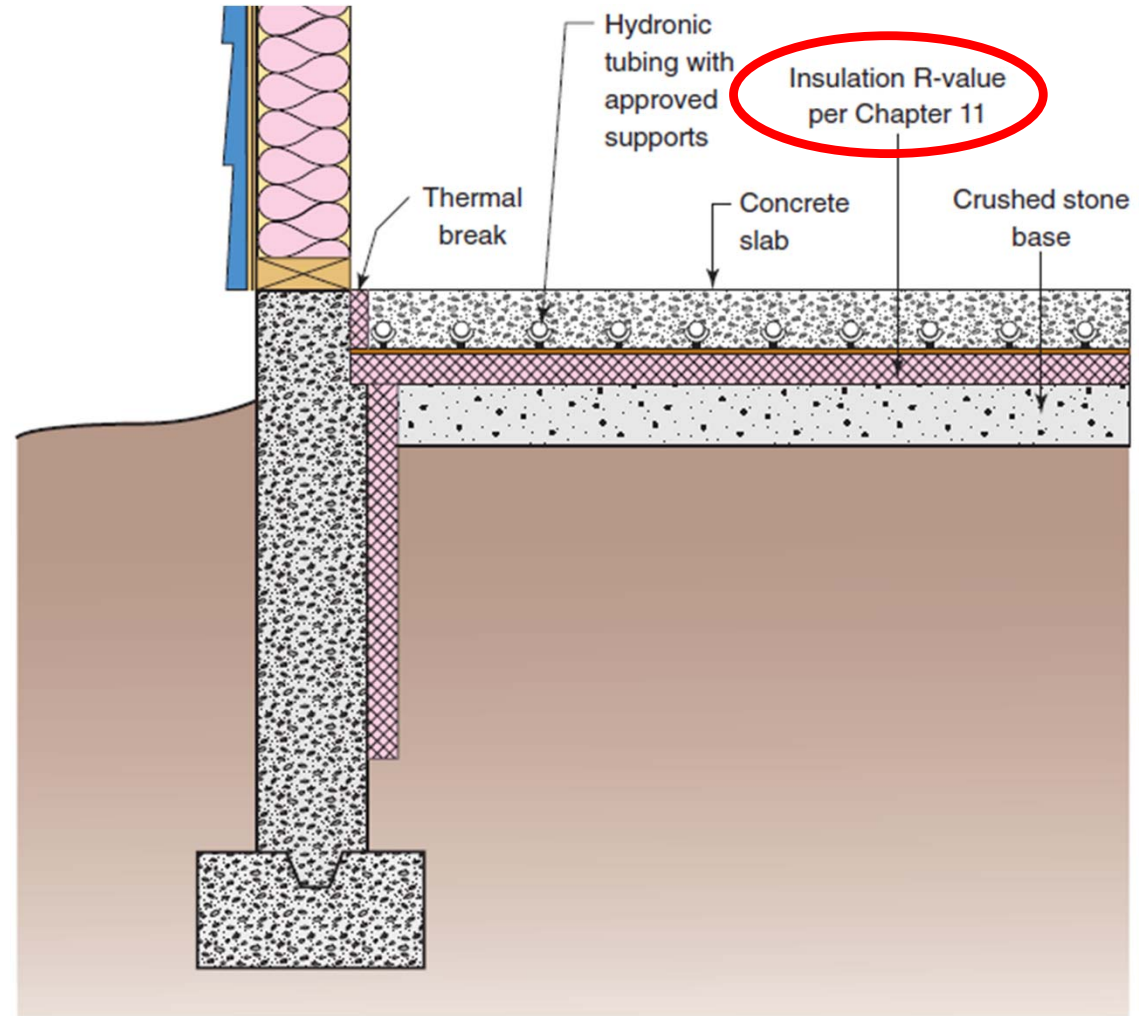
- Compressed air testing of PEX hydronic piping is now allowed when testing is in accordance with the manufacturer's instructions.
- (Yes - Also for PEX in plumbing – coming up)



M2103.2

Thermal Barrier for Radiant Floor Heating Systems

- For hydronic floor heating systems, the minimum insulation R-values have been replaced by a reference to the energy provisions of Chapter 11.



The energy provisions in Chapter 11 determine the insulation R-value for floor heating systems.

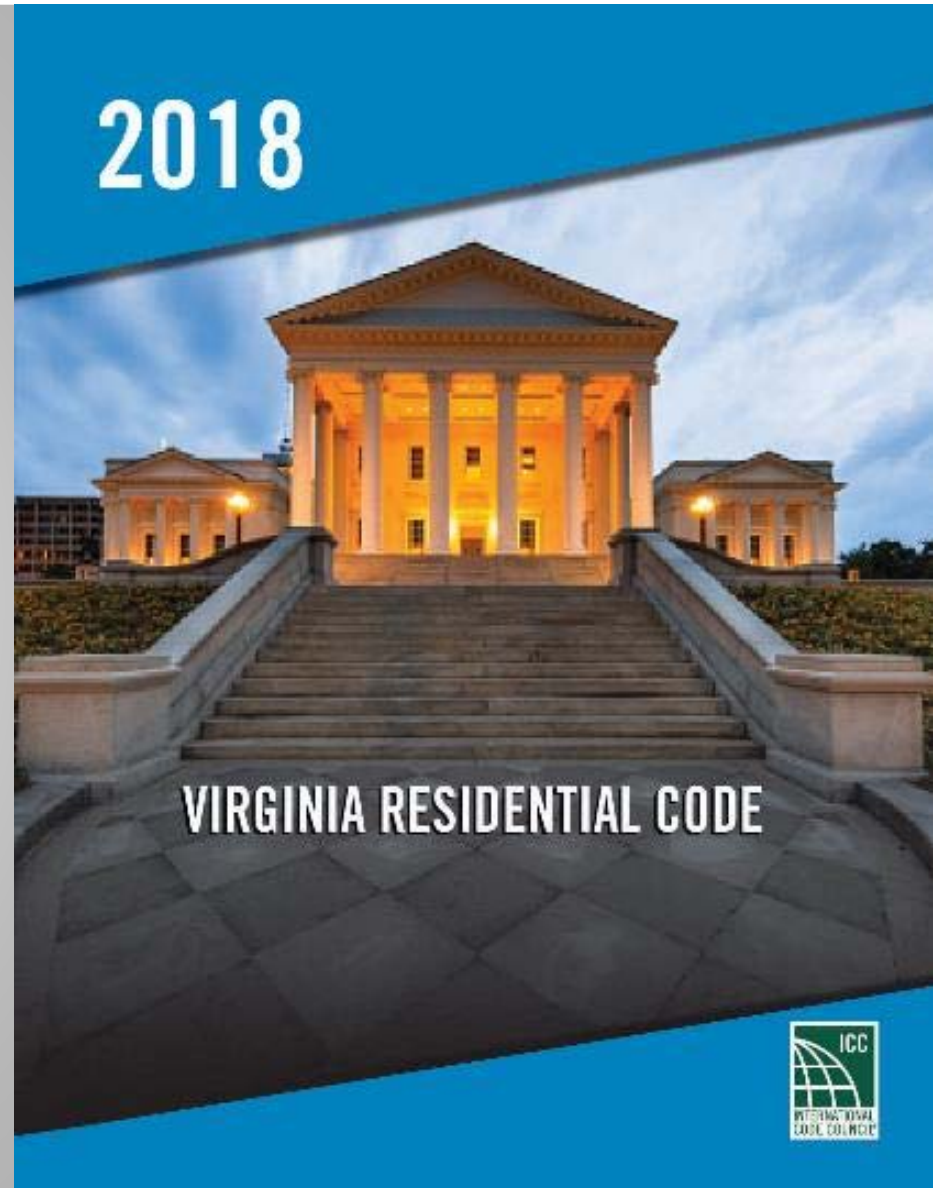
M2301 - Solar Thermal Energy Systems



- ***Clarification – no technical changes intended***
- Requirements for access and freeze protection have been expanded.

Chapter 24

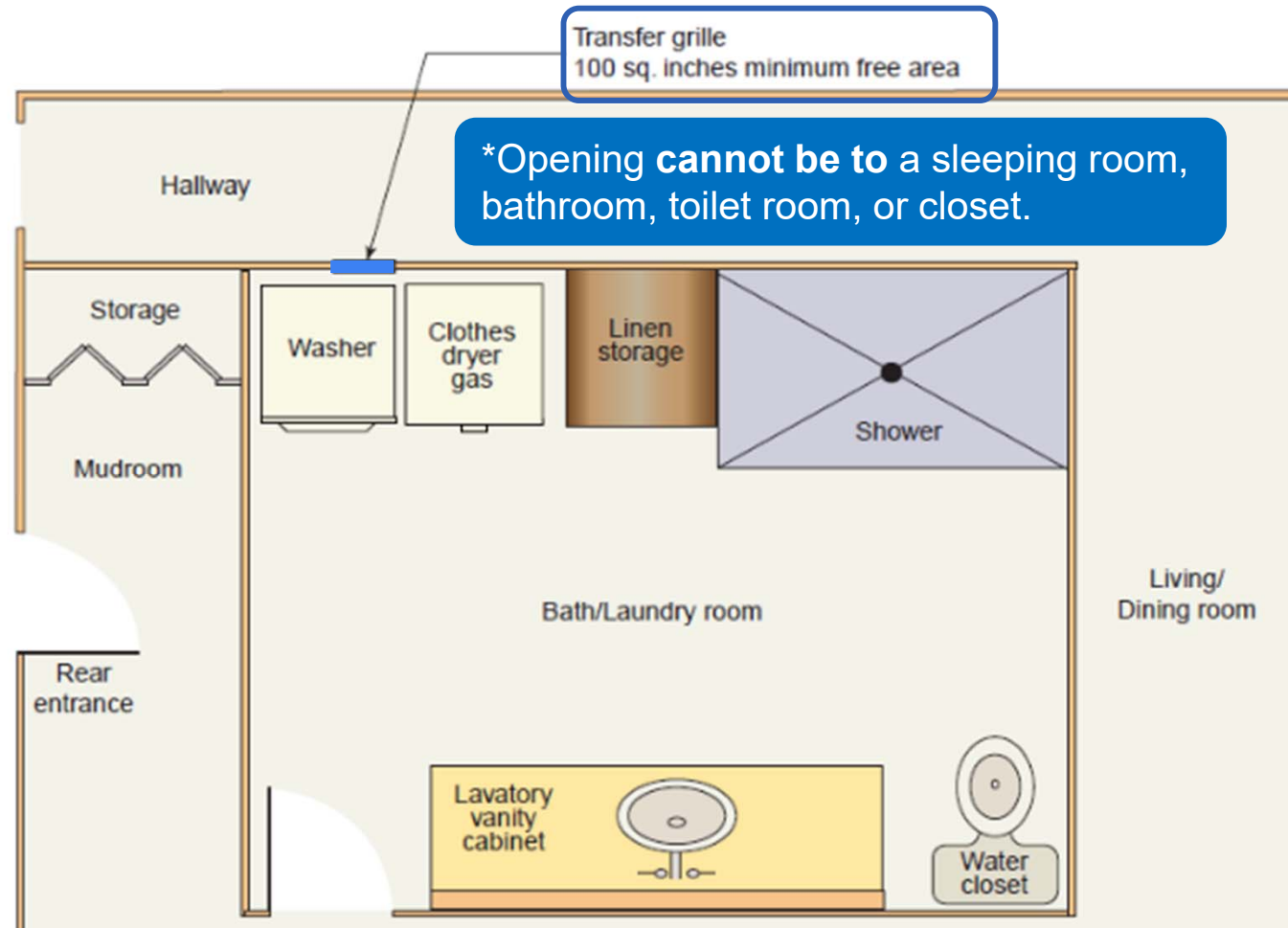
Fuel Gas



G2406.2/ VFGC303.3

Gas-fired Clothes Dryers in Bathrooms

- New exception allows a gas-fired clothes dryer in a toilet room or bathroom, with a permanent vent opening*.



G2411.2, G2411.3/ VFGC 310.2, 310.3

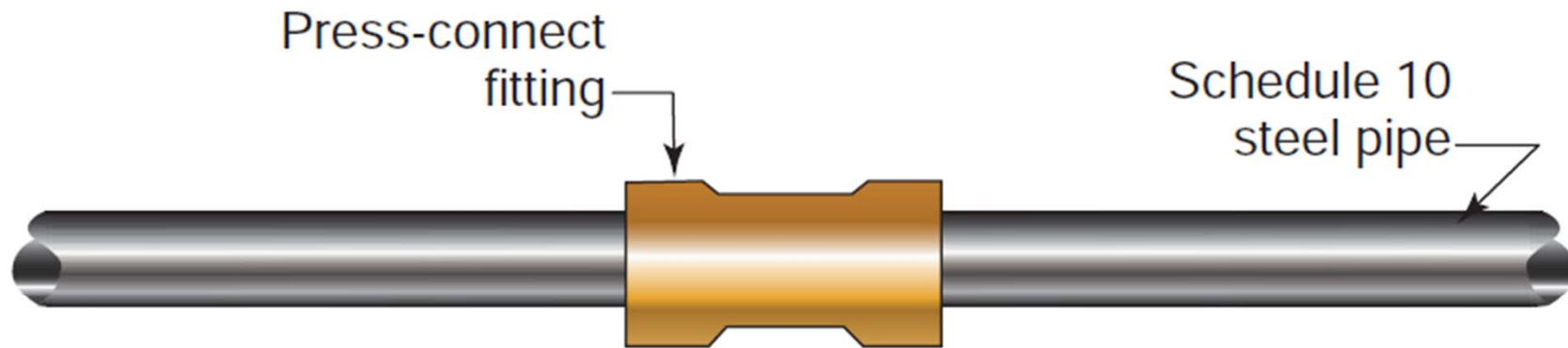
Bonding of CSST and Arc-resistant CSST

- Not a change – VA added this in the 2015 cycle
- The International Code is now consistent with Virginia regarding Arc-resistant CSST.



G2414.4.2, G2414.10.1 / VFGC 403.4.2, 403.10.1

- The code now allows Schedule 10 steel pipe for fuel gas service.
- Press-connect fittings added to 403.10.1 (Pipe joints)

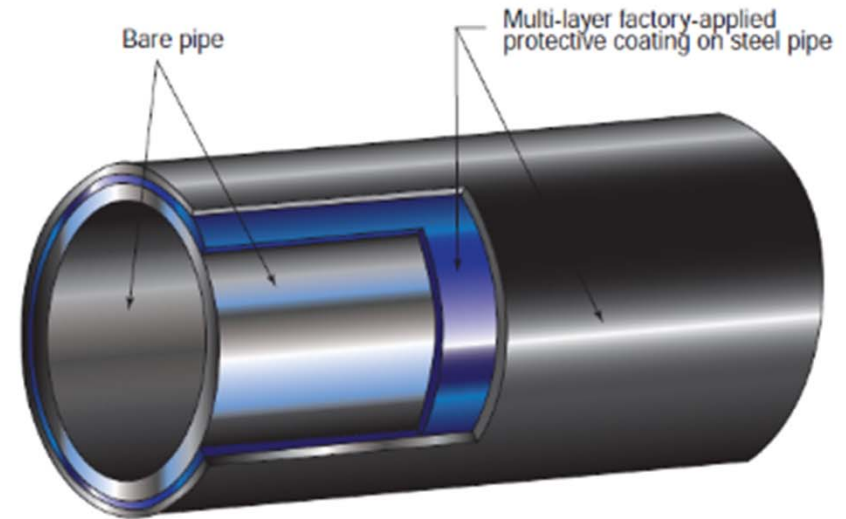


Press-fittings use elastomeric seals and special equipment to join steel gas piping

G2415.11 / VFGC 404.11

Corrosion Protection for Steel Gas Pipe

- This section was rewritten for clarity and now lists three distinct prescriptive methods for protection from corrosion for steel pipe underground.



Factory applied corrosion protection for underground steel pipe

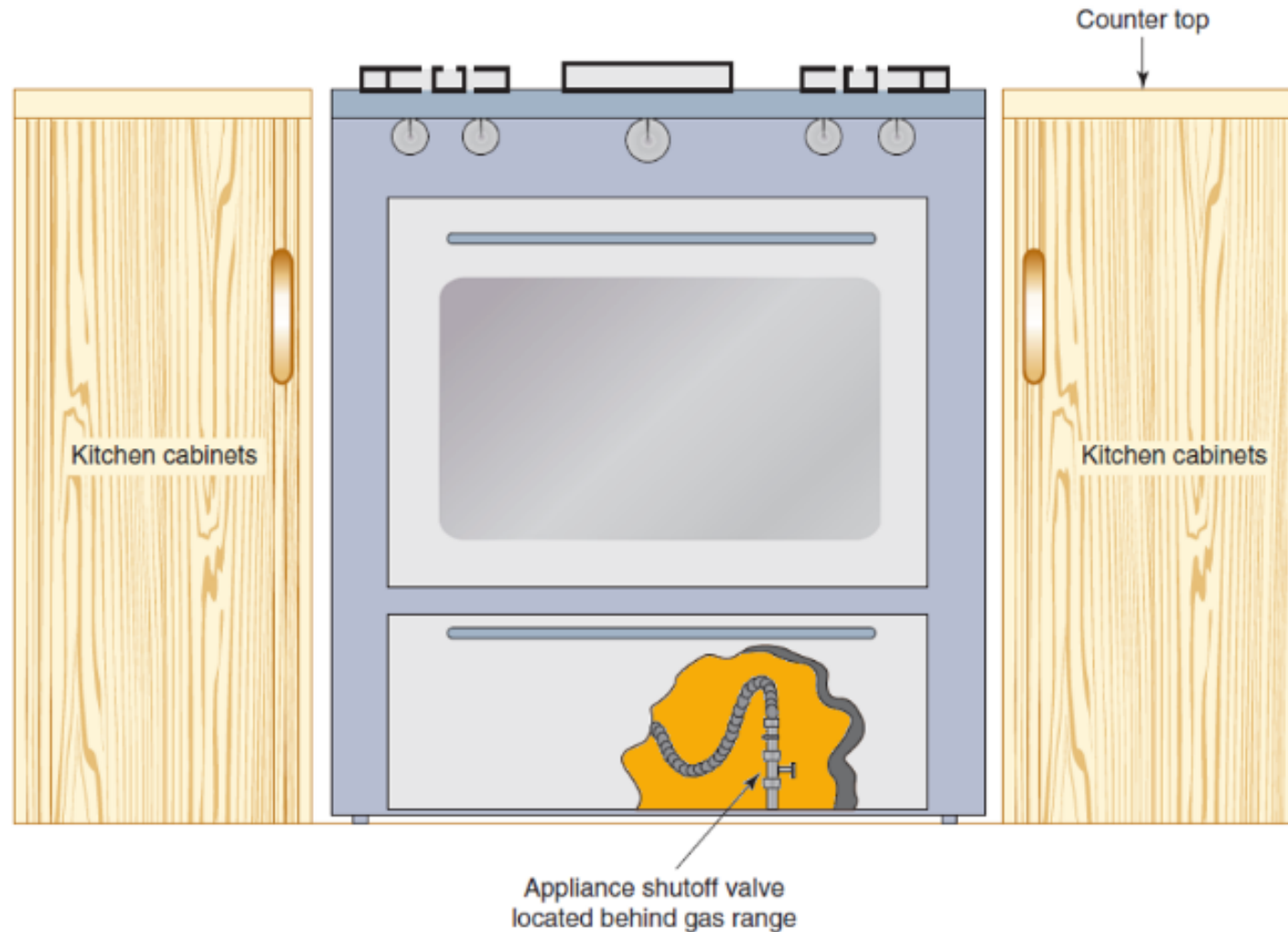


Anodeless riser

G2420.5.1 / VFGC 409.5.1

Access to Shutoff Valves for Movable Appliances

- Clarifies that shutoff valves behind movable appliances meet the code intent for *access*.

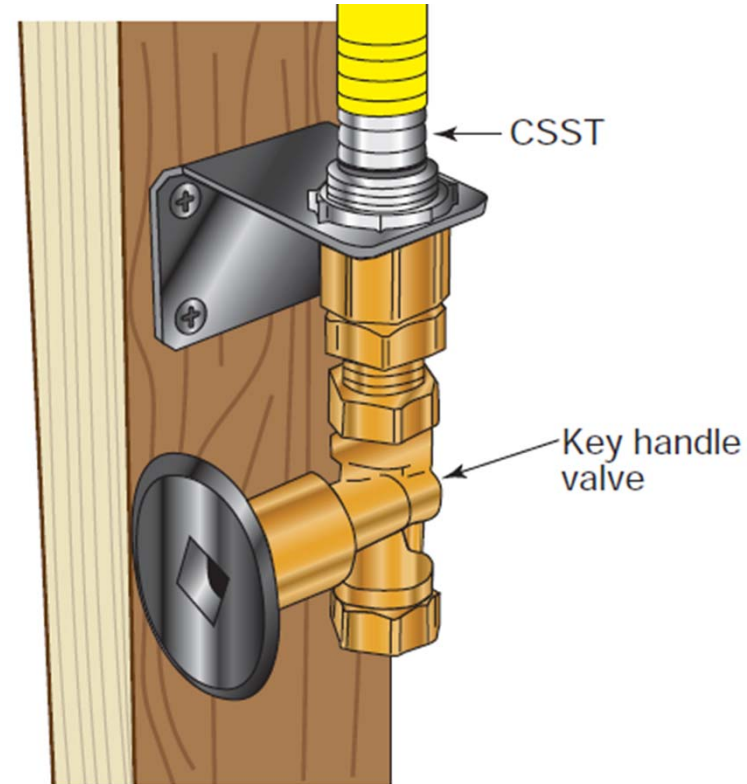
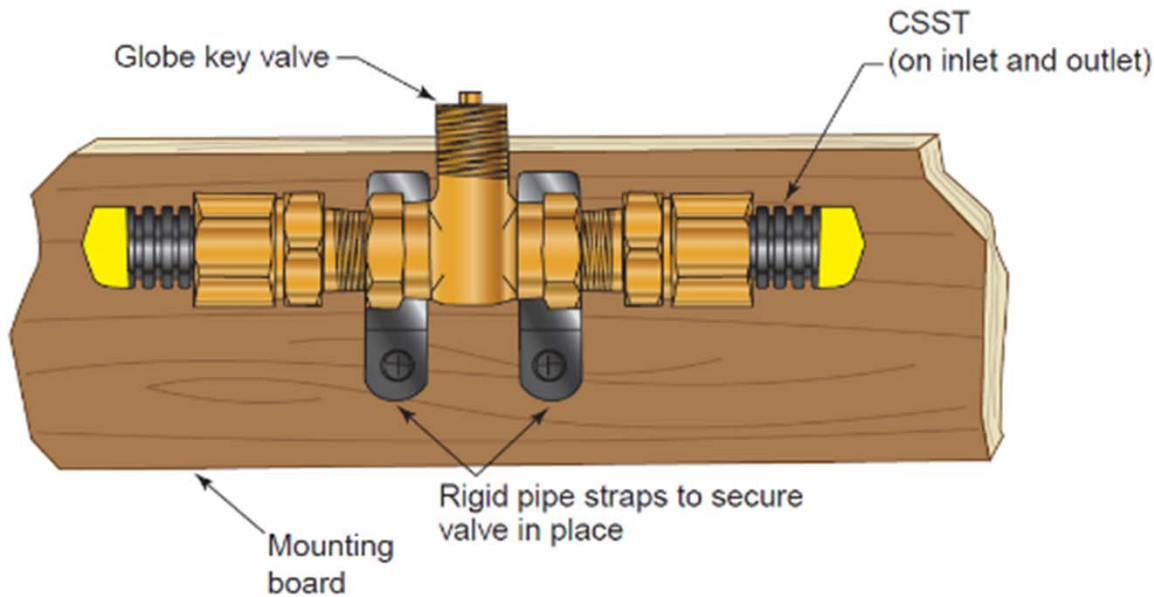


Shutoff valve behind gas range meets the requirement for access

G2420.6 / VFGC 409.7

New Section - Shutoff Valve Support for Tubing Systems

- Independent “rigid and secure” support required.



Key handle valve with support independent of gas tubing

Shutoff valves require support independent of gas tubing.

~~G2442.2 / VFGC 618.2 - Forced-Air Furnace Duct Size~~



Deleted in favor of other sizing methods specific to the appliance.

- Wasn't consistent with industry practice or the Mechanical Code
- Sizing of ducts and transfer openings must be in accordance with:
 - ACCA Manual D – OR
 - Appliance manufacturer's installation instructions – OR
 - Other approved methods, such as an engineered design



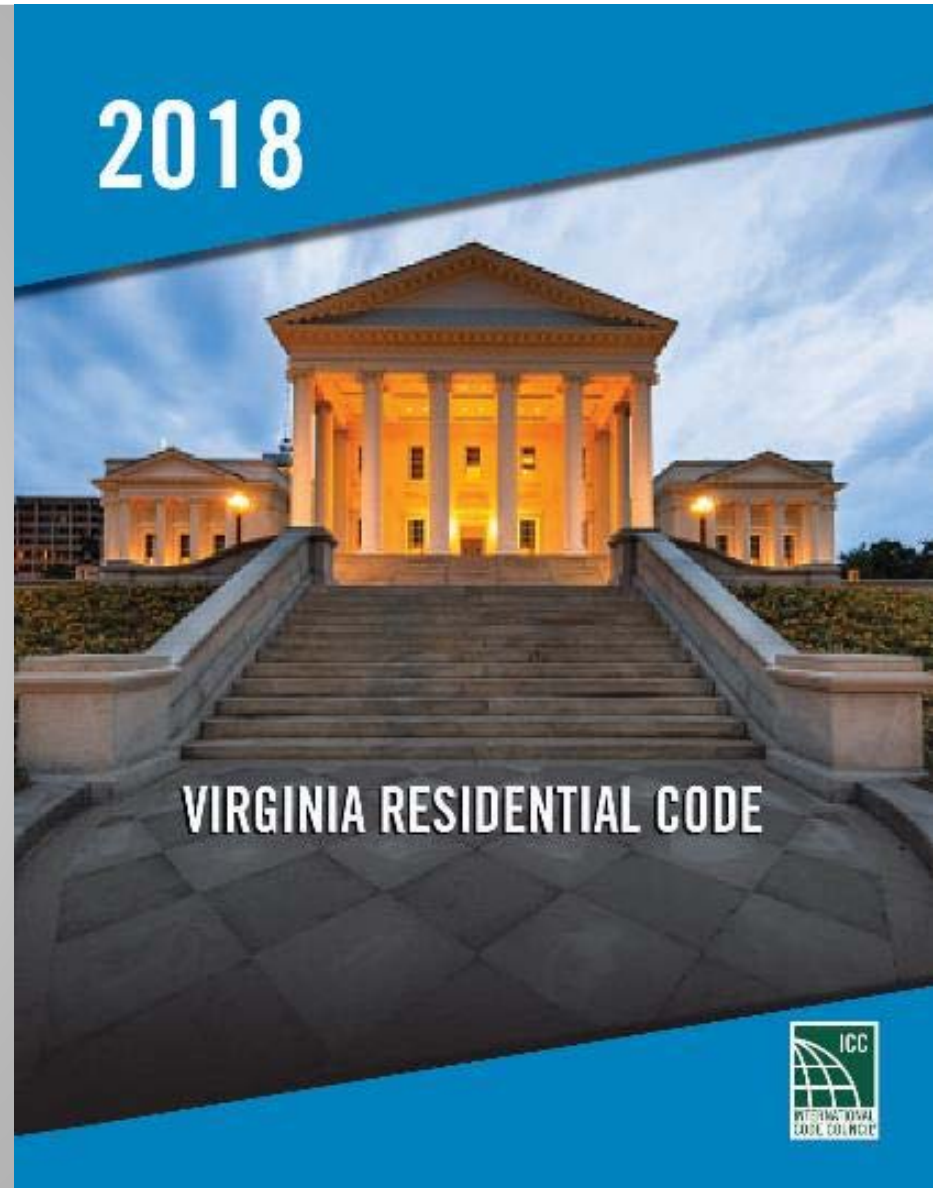
G2447.2 / VFGC 623.2 – Prohibited location

- Commercial cooking appliances are now permitted in dwelling units when installed per an engineered design and the manufacturer's instructions.



Chapters 25 - 33

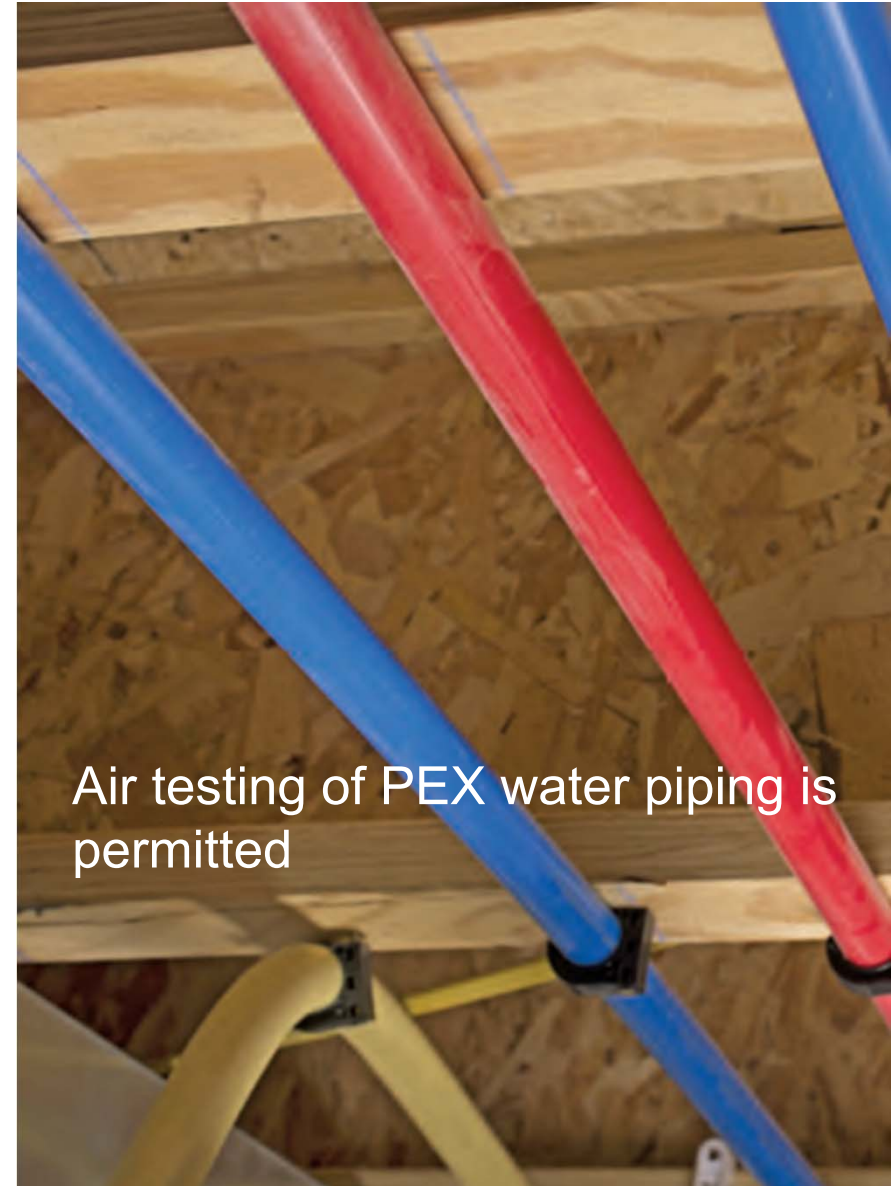
Plumbing



P2503.7

Air Testing of PEX Piping

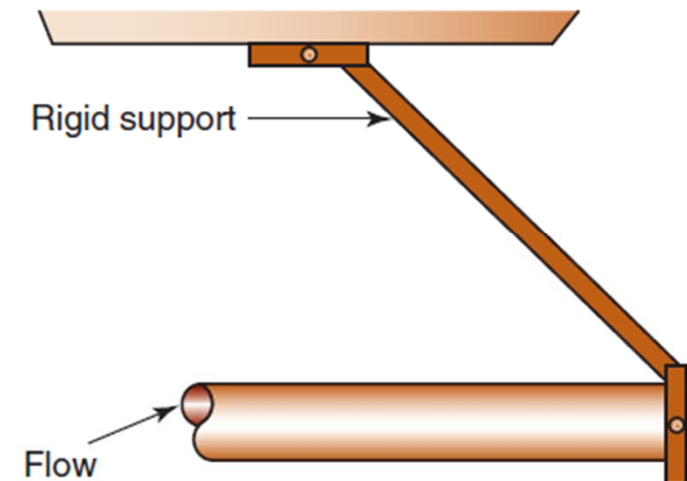
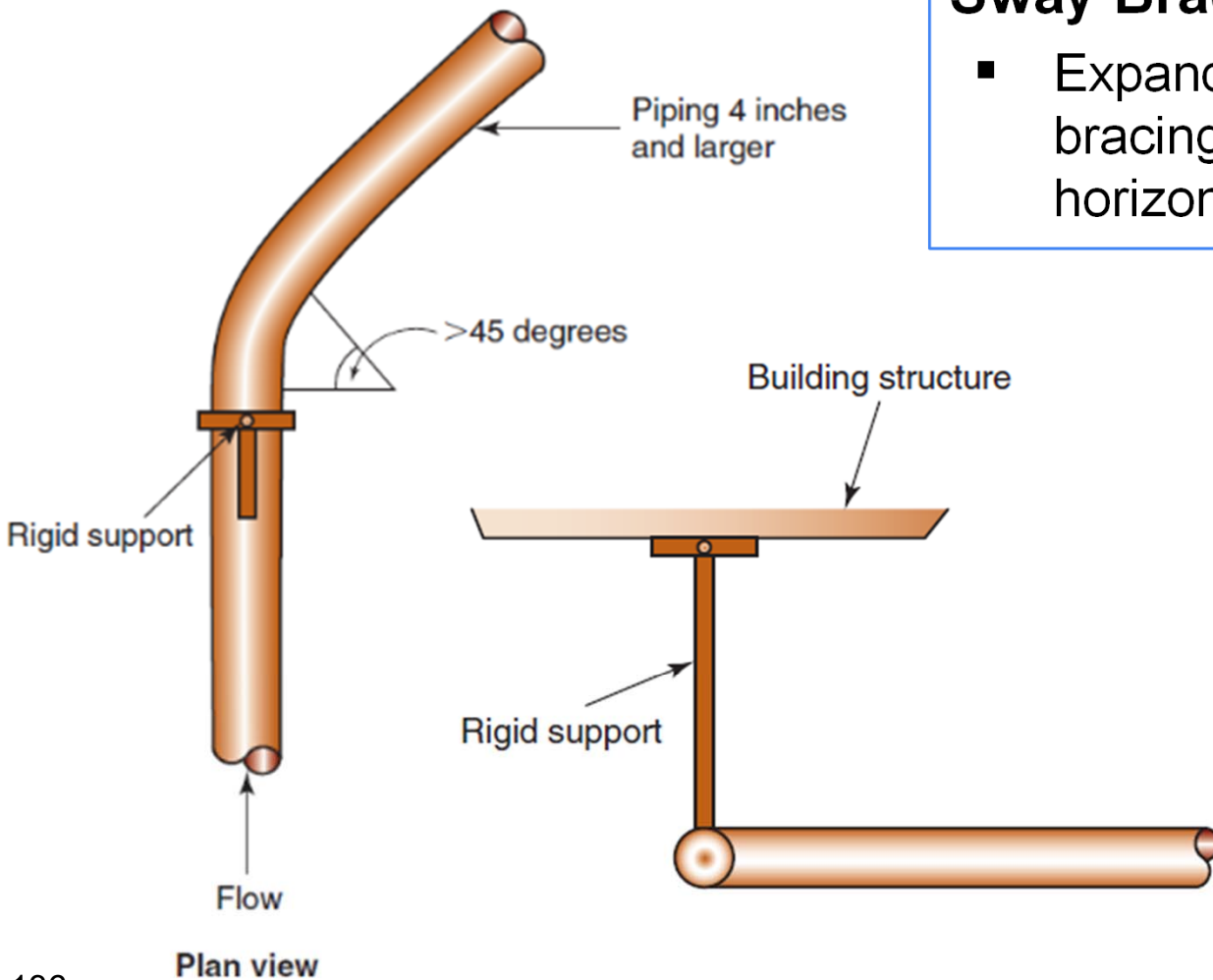
- Compressed-air testing of PEX water-supply piping is now allowed when testing is in accordance with the **pipe AND fitting** manufacturer's instructions.



P2605 / VPC 308.6

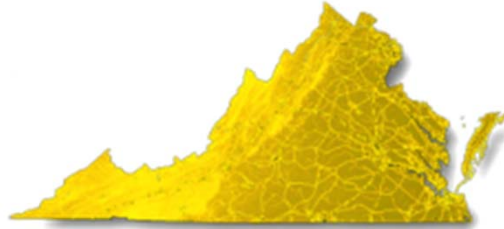
Sway Bracing for Drainage Piping

- Expanded text clarifies that the sway bracing provisions only apply to horizontal drainage piping.



Elevation views

P2801.6

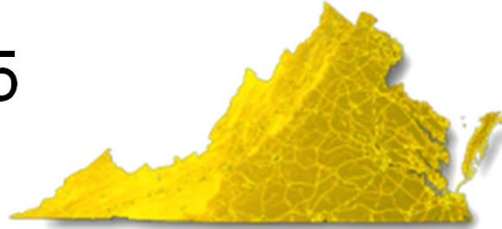


Water Heater Drain Pan Materials

- This is not a change for Virginia – but is a significant difference between the IRC and VRC.
- The 2018 IRC now allows a plastic pan under a gas water heater (if specific flame spread and smoke index requirements are met).
- The VRC keeps the existing 2015 cycle code language, which specifically prohibits a plastic pan under a gas water heater.



P2902.6 / VPC 608.15

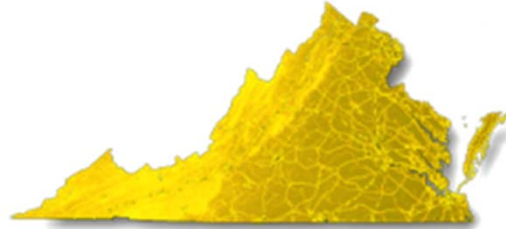


Location of Backflow Preventers

- Adds additional height installation requirements for backflow prevention assemblies

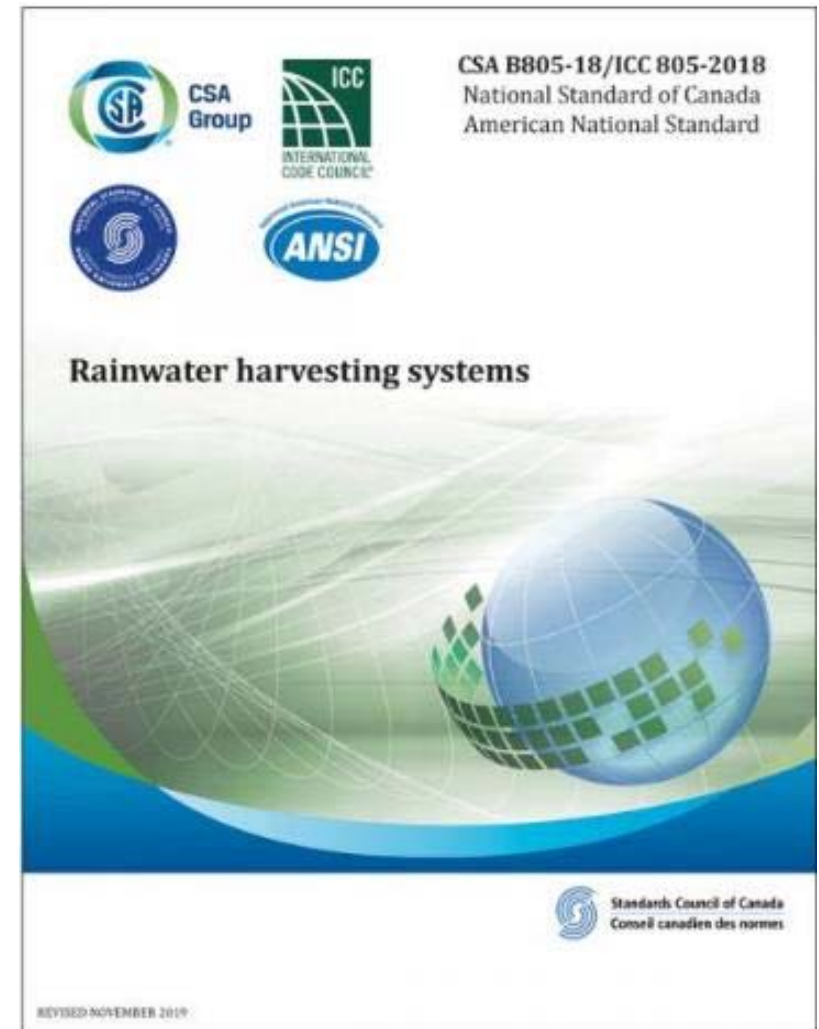


P2912, P2912.1



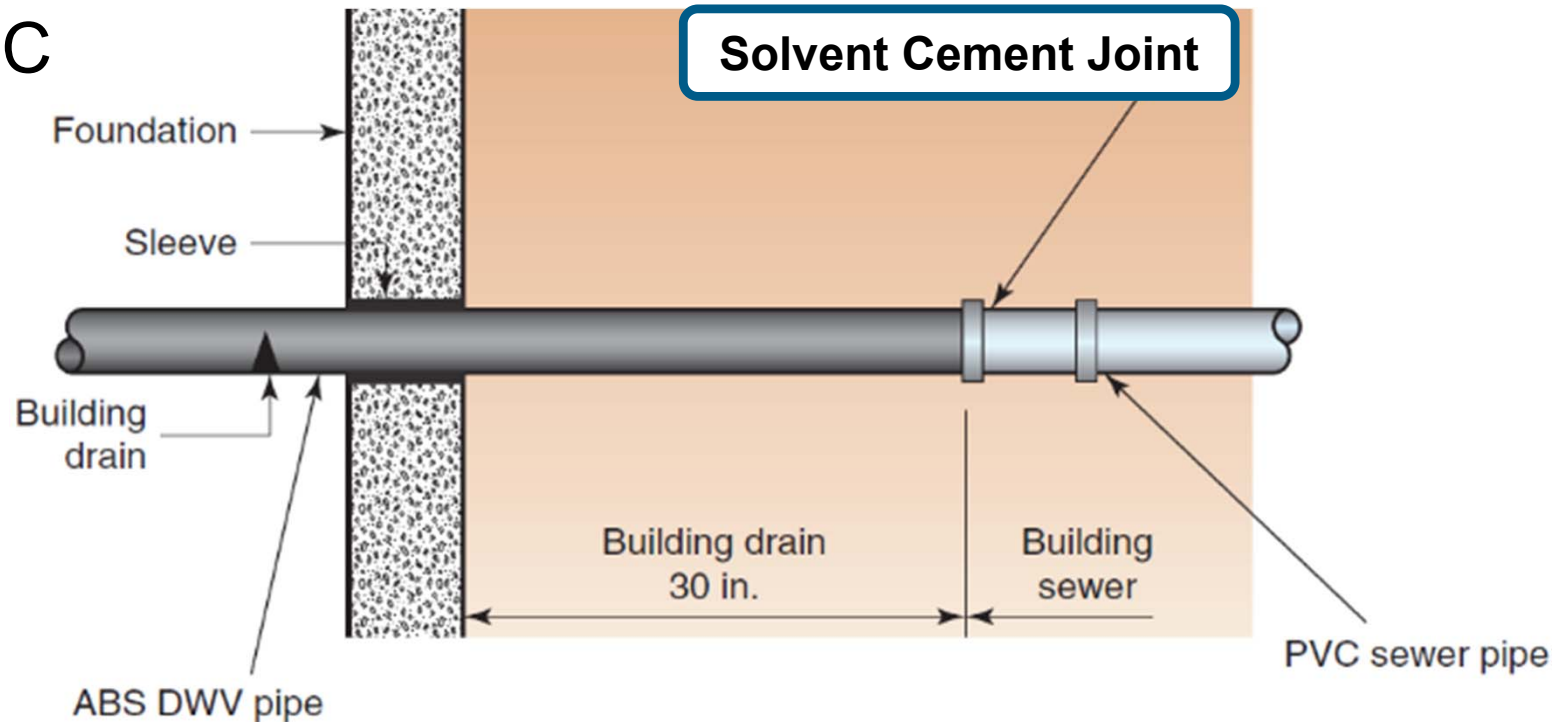
Rainwater Non-potable Water Systems

- Provides an alternative compliance path for collection and use of rainwater for non-potable applications.
- CSA B805-18 / ICC 805-2018



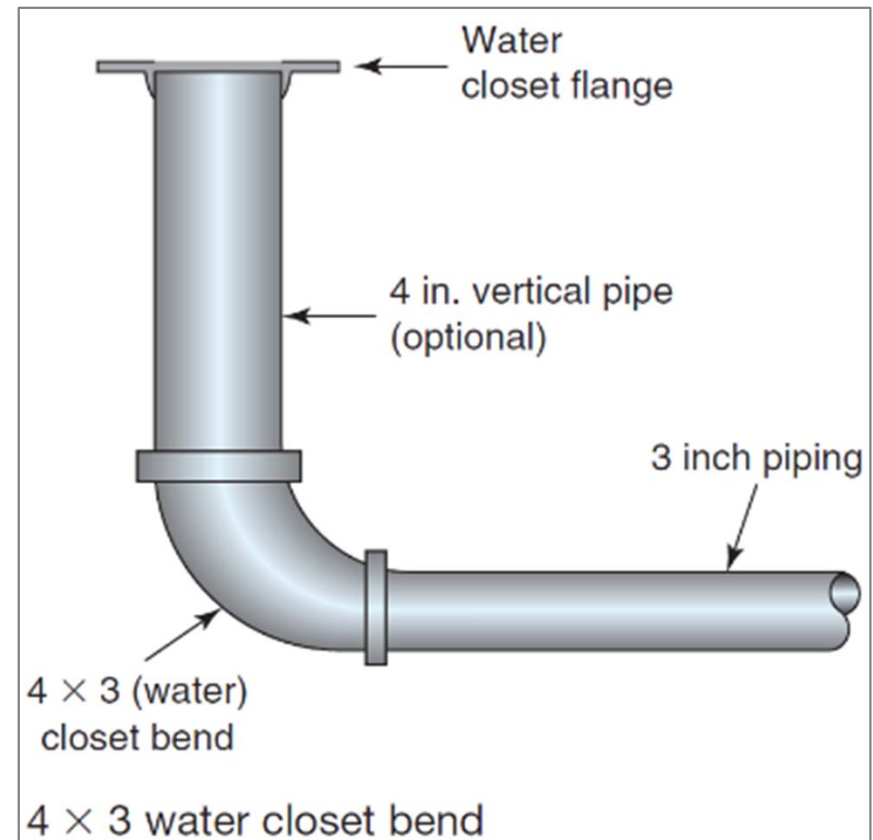
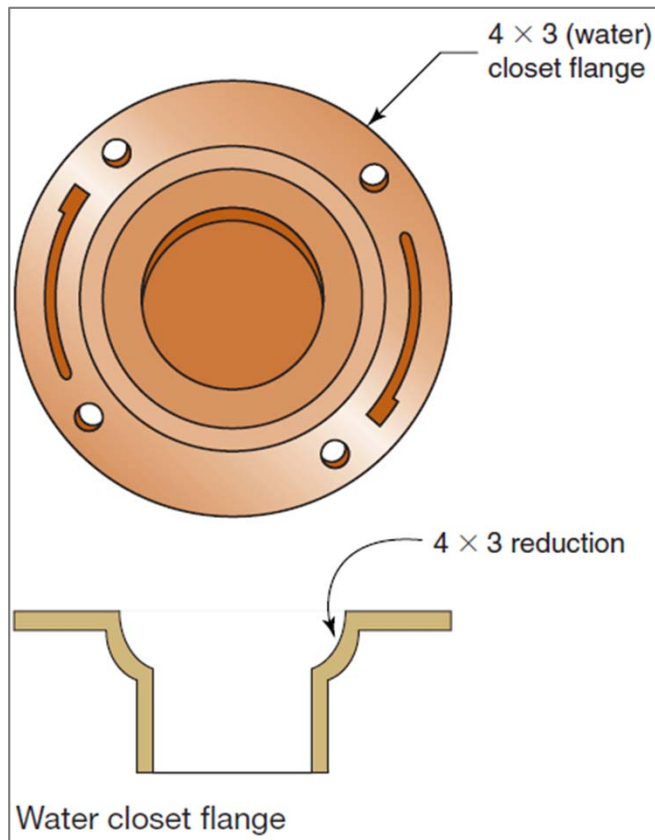
P3003.2 / VPC

705.16.4



PVC to ABS Solvent Cement Joint

- One joint between ABS piping and PVC piping may be solvent cemented with the proper cement (ASTM D3138).

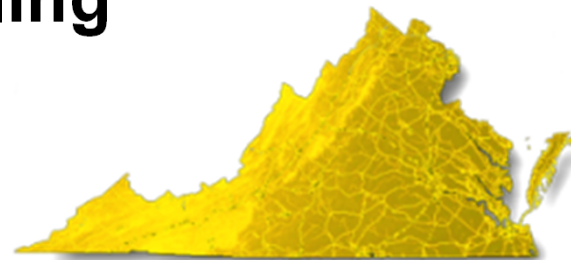


P3005.1.6 /MPC 704.2 - Reduction of Pipe Size

- Bend fittings and offset closet flanges are now addressed.

P3012 / VPC 717 – Relining of Building Sewers and Building Drains

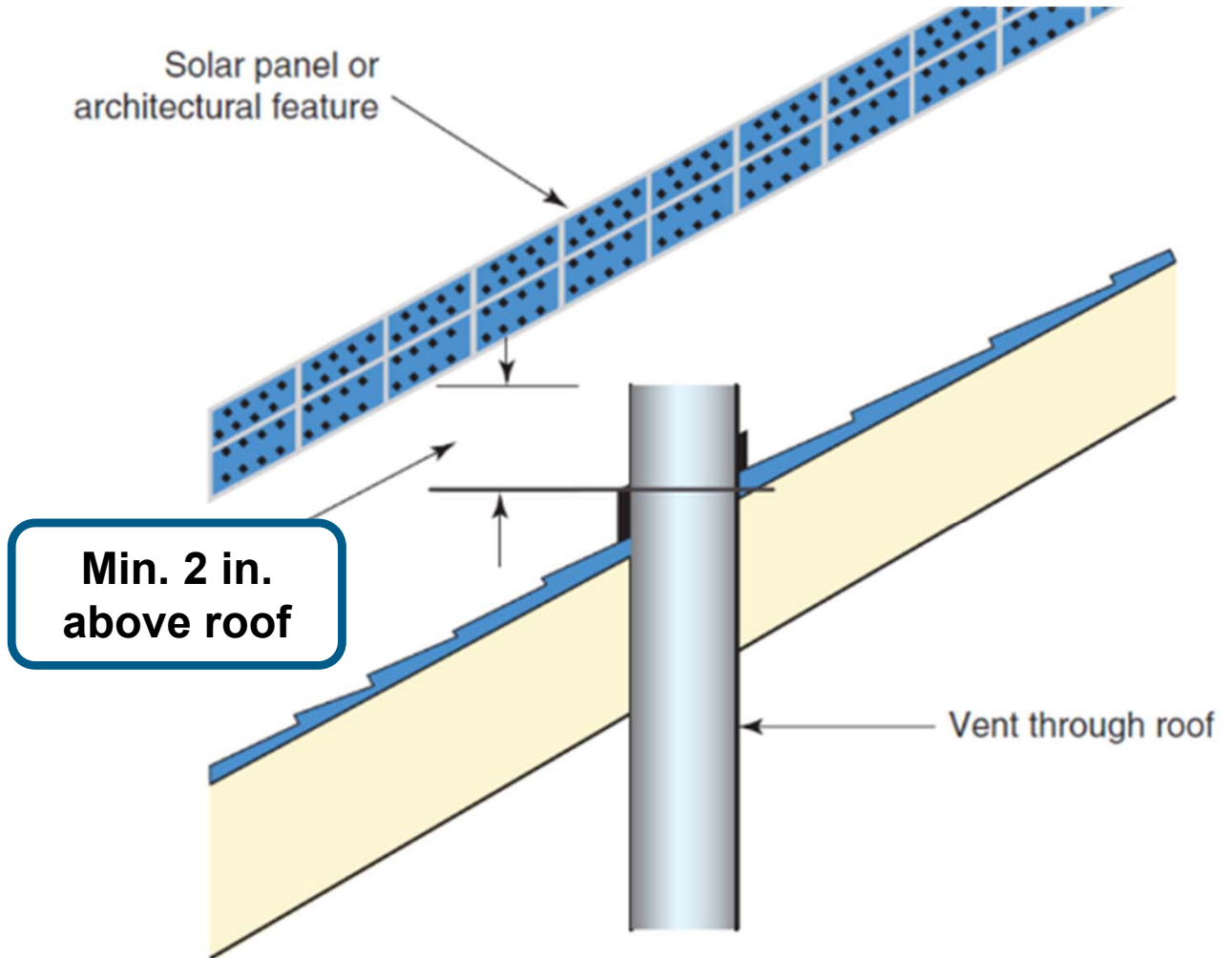
- VA adopts this section verbatim from the 2021 International Plumbing Code (IPC)



P3103.1

Vent Pipe Terminations

- The provisions for vent terminals have been reorganized.
- A new option has been added to allow a 2-inch vent extension through a sloped roof when the vent is covered.

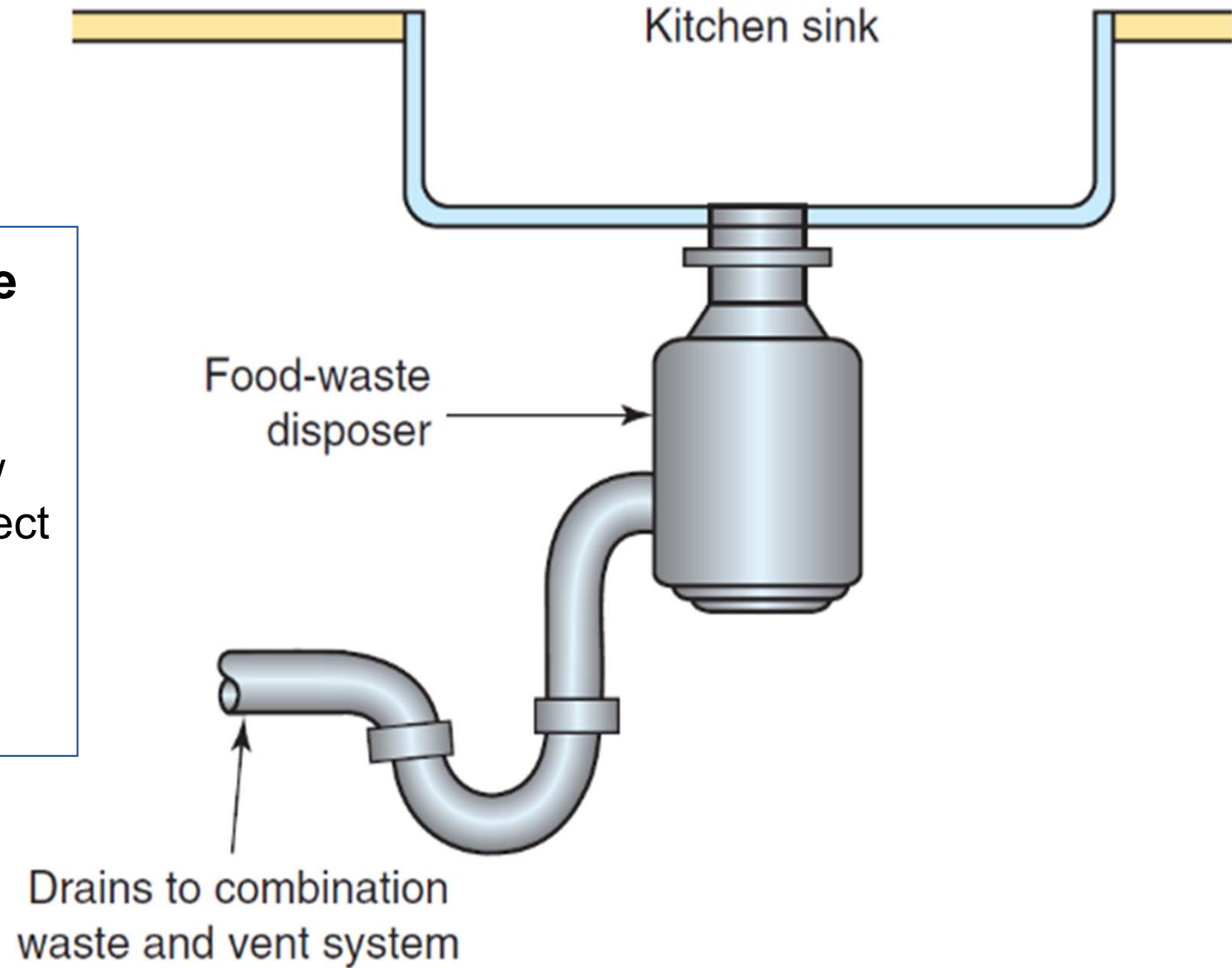


Covered vent pipe termination through roof

P3111

Combination Waste and Vent System

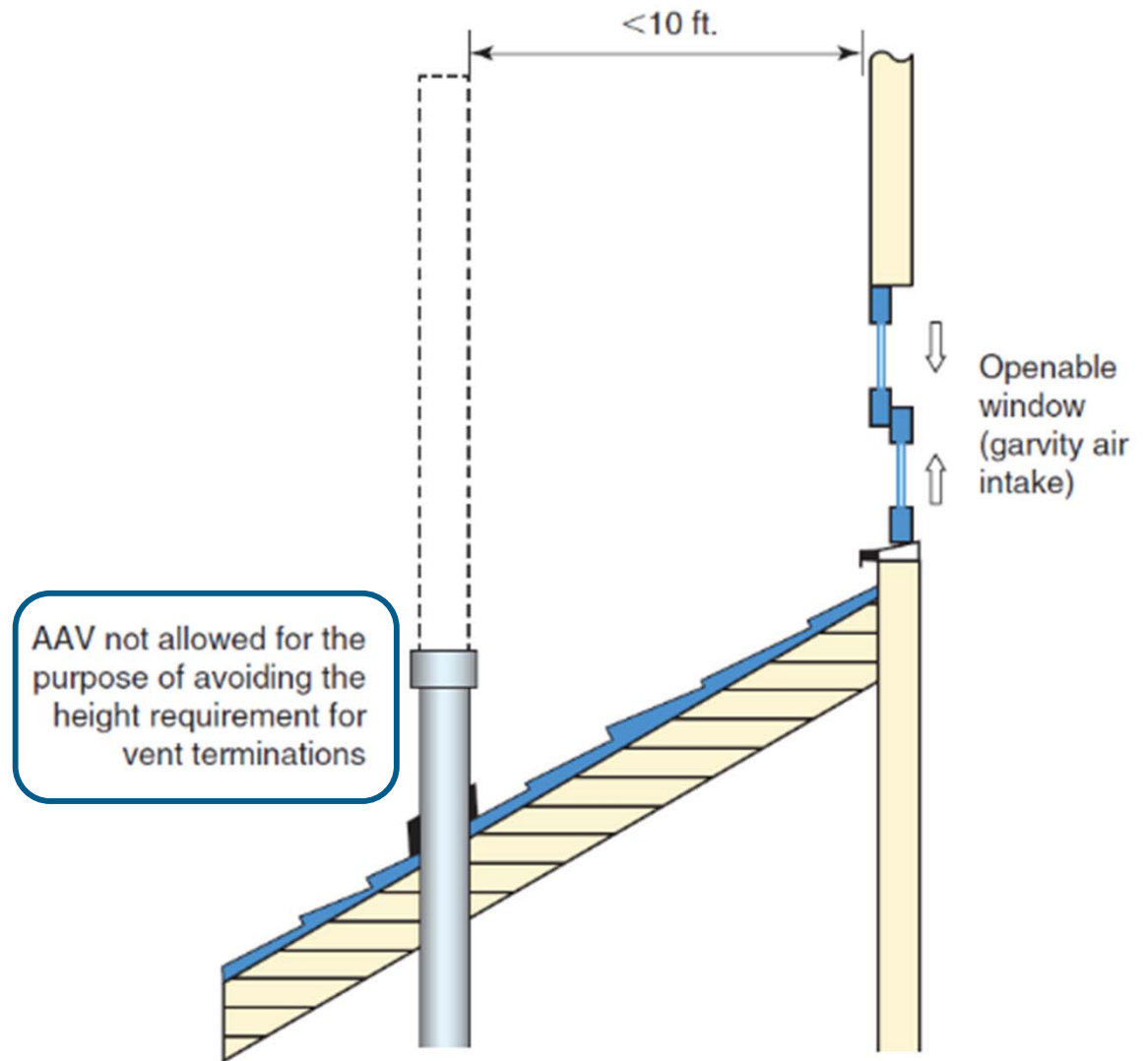
- Food waste disposers are now permitted to connect to a combination waste and vent system.



P3114.8 / VPC 918.8

Prohibited Installations (Air Admittance Valves)

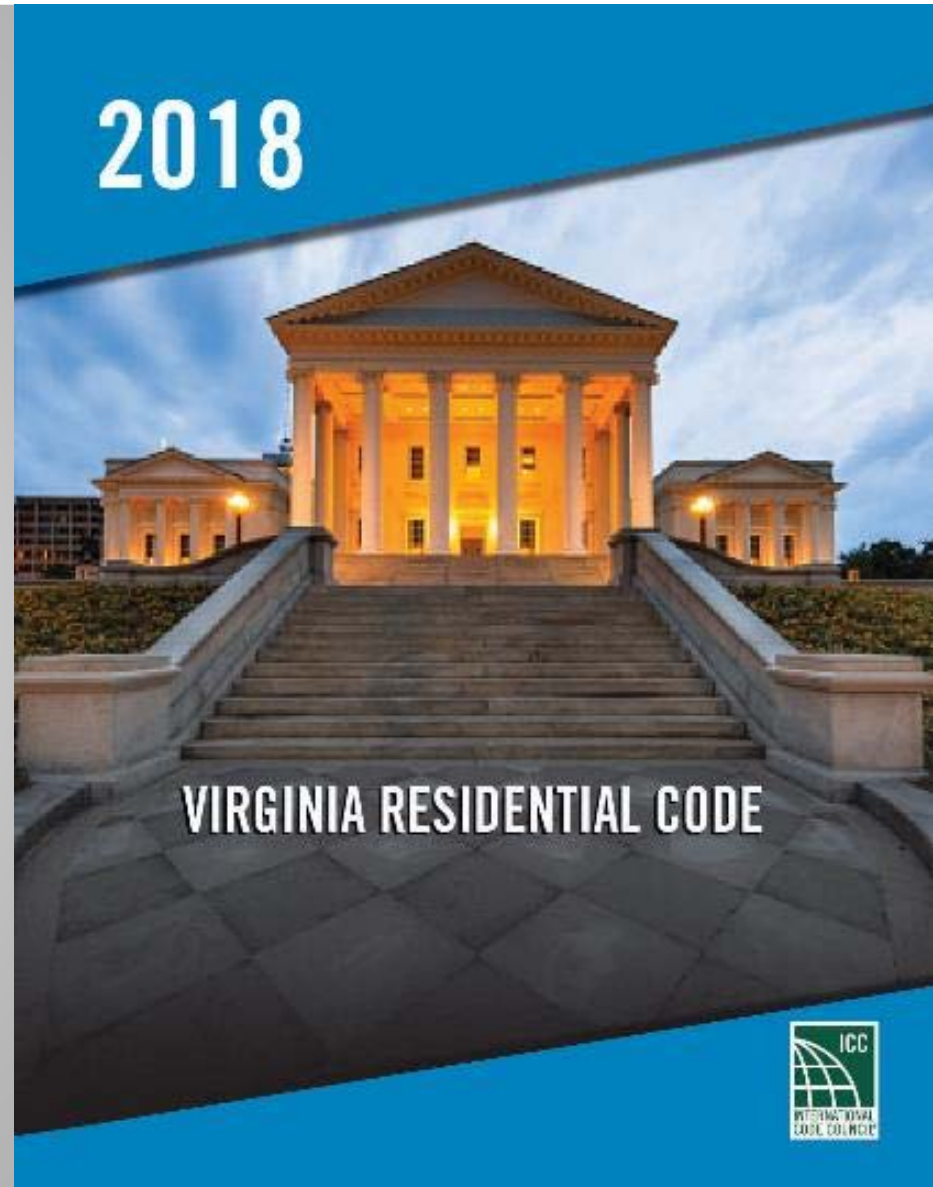
- "Air admittance valves shall not be installed on outdoor vent terminals for the sole purpose of reducing clearances to gravity or mechanical air intakes."



Prohibited installation for air admittance valves

What questions
do you have?

Skill Check 4



Thank You for Attending!

**2018 Virginia
Residential Code (VRC)**

**Significant International Changes and
State Amendments**

