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Valleys for Asphalt Shingle Roofs

Violation 1 : Asphalt shingle valley improperly laid
Code Section(s) : 5th Edition (2014) FBC-Residential R903.2 and R905.2
5th Edition (2014) FBC-Building 1507.1 and 1507.2
Comments : Contractor shall redo the valley to meet the requirements of the code and the manufacturer's installation instructions.

A. Violation 1 : Asphalt shingle valley type improperly installed

This newsletter was originally intended to address closed cut valleys and cutting back the overlapping shingles (from the lesser roof) two inches from the valley centerline to reduce the tendency of water from the greater roof to flow across the valley and up under the cut-back shingles of the lesser roof; however, addressing this one valley aspect lead to including other valley aspects of asphalt shingle roofs.

As is shown below, each manufacturer has their own specifications when it comes to valley installations, thus all the various manufacturers and their various installation requirements cannot be included below. I have included three typical asphalt shingle manufacturers and three typical shingle styles as examples of various valley requirements.

An open valley is not always an allowed option – it depends on the manufacturer, the style of shingle, and is shown (or not shown) in the manufacturer's installation instructions. When an open valley is allowed by the manufacturer, the valley liner specified may well exceed the requirements stated in the code – the most restrictive of the requirements is required to be followed as the codes state that the installation shall be in accordance with both the code and the manufacturer's installation instructions. One example is that the code requires a minimum 16 inch wide metal for a valley liner, while one of the manufacturer's installation instructions examples below requires a minimum 20 inch wide metal for the valley liner – the minimum width required for the metal valley liner would be 20 inches for an installation of that manufacturer's shingles.

The valley liner material also varies by manufacturer and is specified in each manufacturer's installation instructions – a self-adhering membrane for the valley liner material is commonly specified, frequently by specific brand and type, with one of the manufacturer's installation instructions allowing for "or equivalent" (the others specify the valley liner to use and do not allow for "or equivalent").

The valley style, and the valley lining material, must meet the requirements of the code and the requirements of the manufacturer's installation instructions, whichever is the more restrictive. Typically, the manufacturer's installation instructions are more restrictive, and more specific, than the code, as shown in the examples given below.

Open Valleys:

Code requirements:

Metal lined:
Minimum 16 inches wide
See TABLE R903.2.1 for metal types and thicknesses
Nonmetallic lined:
2-layers mineral surfaced roll roofing – bottom layer minimum 18 inches wide, with top layer minimum 36 inches wide (ASTM D 3909 or ASTM D 6380 Class M)

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Manufacturer's Installation Instructions:

Typical examples – valley sections linked in sections below; full installation instructions linked here
GAF: Timberline installation instructions
CertainTeed: Full Landmark installation instructions
Owens-Corning: Full Duration installation instructions

GAF:
Timberline : Shows an open valley – the installation must meet code "and" manufacturer's installation instructions, which specifies a specific valley liner installation "Center full width roll of GAF Leak Barrier." – there are two types GAF Leak Barrier, both are self-adhering membranes.

Those instructions also specify a 20 inch wide valley metal – "Overlap shingles at least 4" (102mm) over 20" (508mm) wide valley metal." While the code may allow a 16 inch wide metal valley liner … GAF specifies a 20 inch wide valley metal and the installation must meet code "and" manufacturer's installation instructions.

CertainTeed:
Landmark : Open valley not permitted as the manufacturer's installation instructions do not show an open valley and the installation must meet code "and" manufacturer's installation instructions.

Owens-Corning:
Duration : States that "Both woven and metal valleys are acceptable alternatives." That statement says "metal valleys", and a "metal valley" implies an open valley. An open valley is not detailed in the manufacturer's installation instructions, thus an open valley may be installed as in accordance with the requirements of the code and still meet the code "and" manufacturer's installation instructions

Closed Valleys:

Code requirements:

1-layer of smooth roll roofing (ASTM D 6380 Class S)
1-layer self-adhering modified bitumen (ASTM D 1970)

Manufacturer's Installation Instructions:

GAF:
Timberline : Shows a closed cut valley – the installation must meet code "and" manufacturer's installation instructions, which specifies a specific valley liner installation "Center full width roll of GAF Leak Barrier." – there GAF has two types leak barriers, either may be used and both are self-adhering membranes – the use of either meets allows the installation to meet code "and" manufacturer's installation instructions.

CertainTeed:
Landmark : Only shows the closed, cut valley – installation must meet code "and" manufacturer's installation instructions, which specifies a specific valley liner installation "Line valley by centering 36 (915 mm) wide CertainTeed WinterGuard Waterproofing Shingle Underlayment or equivalent directly to deck." The specified valley liner is a self-adhering membrane, as such, an "equivalent" would not only need to also be a self-adhering, but have the same or greater properties and warranty as the specified valley liner for the installation to meet code "and" manufacturer's installation instructions.

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Page 113 (file page 4 of 8) shows one type of valley, the cut valley, with the lesser roof overlapping the greater roof and cut back 2 inches from the center of the valley

Owens-Corning:

Duration : The manufacturer's installation instructions detail a closed cut valley, it also states that "Both woven and metal valleys are acceptable alternatives." These installation instructions permit closed cut valleys and woven closed valleys – closed cut valleys are detailed in the manufacturer's installation instructions and specify "Lay a 36"-wide valley liner of selfadhered membrane underlayment or equivalent. A 36"-wide minimum 50-lb. smooth surface roll roofing can also be used as a valley liner." Either of those two valley liners allows the installation to meet both the code "and" manufacturer's installation instructions for the closed cut valley.

Page 6 (file page 7 of 8) details, and shows in Fig. 6 the closed cut valley, with the lesser roof overlapping the greater roof and cut back 2 inches from the center of the valley.

From the 5th Edition (2014) Florida Building Code, Residential (bold and underlining in code below are mine)

- *CHAPTER 9 ROOF ASSEMBLIES*

SECTION R903 WEATHER PROTECTION

R903.1 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 assemblies shall be designed and installed in accordance with this code **and** the approved manufacturer's installation instructions such that the roof assembly shall serve to protect the building or structure.*

R903.2 Flashing.

Flashings 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.

R903.2.1 Locations.

*Flashings shall be installed at wall and roof intersections, wherever there is a change in roof slope or direction **and** around roof openings. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than provided in Table R903.2.1.*

Exception: Flashing is not required at hip and ridge junctions.

TABLE R903.2.1 METAL FLASHING MATERIAL

MATERIAL	GAGE MINIMUM THICKNESS (INCHES)	GAGE	WEIGHT (lbs per sq ft)
Copper	0.024	1 (16 oz)	
Aluminum	0.024		
Stainless steel	28		
Galvanized steel	0.0179	26 (zinc coated G90)	26 (zinc coated G90)
Aluminum zinc coated steel	0.0179	26 (AZ50 alum zinc)	26 (AZ50 alum zinc)
Zinc alloy	0.027		
Lead	2.5 (40 oz.)		
Painted terne	1.25 (20 oz.)		

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SECTION R905 REQUIREMENTS FOR ROOF COVERINGS

R905.1 Roof covering application.

*Roof coverings shall be applied in accordance with the applicable provisions of this section **and** the manufacturer's installation instructions. Unless otherwise specified in this section, roof coverings shall be installed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3).*

R905.2 Asphalt shingles.

The installation of asphalt shingles shall comply with the provisions of this section.

R905.2.8 Flashing.

Flashing for asphalt shingles shall comply with this section.

R905.2.8.2 Valleys.

***Valley linings shall be installed in accordance with the manufacturer's installation 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 16 inches (406 mm) wide and of any of the corrosion-resistant metals in Table R903.2.1.*
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, 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 (valley covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380 Class S and at least 36 inches wide (914 mm) or valley lining 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.*

Table R905.2.8.2 Valley Lining Material.

Reserved.

From the 5th Edition (2014) Florida Building Code, Building (bold and underlining in code below are mine)

○ *CHAPTER 15 ROOF ASSEMBLIES AND ROOFTOP STRUCTURES*

SECTION 1507 REQUIREMENTS FOR ROOF COVERINGS

1507.1 Scope.

*Roof coverings shall be applied in accordance with the applicable provisions of this section **and** the manufacturer's installation instructions.*

1507.2 Asphalt shingles.

The installation of asphalt shingles shall comply with the provisions of this section.

1507.2.9 Flashings.

*Flashing for asphalt shingles shall comply with this section. Flashing shall be applied in accordance with this section **and** the asphalt shingle manufacturer's printed instructions.*

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 16 inches (406 mm) wide and of any of the corrosion-resistant metals in Table 1503.2.*
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 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, 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.*

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Table 1507.2.9.2 Valley Lining Material.
Reserved.

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Please, if you have any items, issues or tips you would like to share with other building officials / inspectors / plan reviewers, send the items, issues or tips to jerry@jerrypeck.com for inclusion in future newsletters.

All contributors will be acknowledged and given credit for their contributions … **PLEASE help others by sharing the items, issues, and tips you have found in the field or during plan reviews**.

I look forward to all contributions, and suggestions for future topics.

Respectfully submitted,

Jerry Peck
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