



# PRODUCT & ENGINEERING MANUAL

## **NUCOR VR 16 II™ STANDING SEAM ROOF SYSTEM TABLE OF CONTENTS**

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## **NUCOR VR16 II™ VERTICAL RIB STANDING SEAM ROOF SYSTEM**

The Nucor VR16 II™ vertical rib standing seam roof system panel is available as a component of one of Nucor Building Systems' Standard Roof Systems.

Nucor Building Systems offers two clip types, a Short Sliding clip and a Tall Sliding clip, based on the amount of insulation required on the roof.

The Short Sliding clip has a 1/2" standoff and allows a maximum of 4" insulation.

The Tall Sliding clip has a 1 1/2" standoff and allows a maximum of 6" insulation.

Information about the available panel and seaming options, panel properties, performance and testing information, and much more is available at the Nucor Building Systems website at the below link.

[Nucor VR16 II™ Vertical Rib Standing Seam Roof Panel](#)

The following pages outline the span capacities as well as provide Nucor standard details for this roof system.



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## NUCOR VR16 II™ PROPERTY AND SPAN TABLES

### Properties & Gravity and Wind Pressure Values for: VR16 II-90 Seam Panel

Panel Gage	Fy (ksi)	Base Thick. (in.)	Total Thick. (in.)	Panel Weight (lb/ft <sup>2</sup> )	Top in Compression (POS)			Bottom in Compression			Fb (ksi)
					Ix (in <sup>4</sup> /ft)	Sx (in <sup>3</sup> /ft)	Ma (in-kip)/ft	Ix (in <sup>4</sup> /ft)	Sx (in <sup>3</sup> /ft)	Ma (in-kip)/ft	
24	50	0.0225	0.0241	1.35	0.166	0.099	2.97	0.073	0.061	1.83	30
22	50	0.0300	0.0316	1.77	0.225	0.140	4.20	0.110	0.094	2.82	30
Panel Gage	Number of Spans	Load Type	Maximum Total Uniform Load (psf)								
			Span Lengths (ft.)								
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	
24	1	POS	876	493	316	219	161	123	97	79	
	2	POS	460	276	183	130	96	74	59	48	
	3	POS	542	333	223	159	119	92	73	60	
	4	POS	517	315	210	149	111	86	69	56	
22	1	POS	1250	703	450	312	230	176	139	112	
	2	POS	735	436	287	202	150	116	92	75	
	3	POS	875	529	351	249	185	143	114	93	
	4	POS	831	499	330	234	174	134	107	87	

### Properties & Gravity and Wind Pressure Values for: VR16 II-360 Seam Panel

Panel Gage	Fy (ksi)	Base Thick. (in.)	Total Thick. (in.)	Panel Weight (lb/ft <sup>2</sup> )	Top in Compression (POS)			Bottom in Compression			Fb (ksi)
					Ix (in <sup>4</sup> /ft)	Sx (in <sup>3</sup> /ft)	Ma (in-kip)/ft	Ix (in <sup>4</sup> /ft)	Sx (in <sup>3</sup> /ft)	Ma (in-kip)/ft	
24	50	0.0225	0.0241	1.35	0.140	0.078	2.35	0.063	0.056	1.67	30
22	50	0.0300	0.0316	1.77	0.195	0.114	3.42	0.095	0.085	2.54	30
Panel Gage	Number of Spans	Load Type	Maximum Total Uniform Load (psf)								
			Span Lengths (ft.)								
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	
24	1	POS	695	391	250	174	128	98	77	63	
	2	POS	446	262	171	120	89	68	54	44	
	3	POS	537	319	210	148	110	85	67	55	
	4	POS	508	301	197	139	103	79	63	51	
22	1	POS	1013	570	365	253	186	143	113	91	
	2	POS	697	405	263	184	136	105	83	67	
	3	POS	846	497	325	228	169	130	103	84	
	4	POS	798	467	305	214	158	122	96	78	

**NOTE:** Positive load (POS) is applied inward toward the panel supports and is applied to the outer surface of the full panel.



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## Wind Suction Values for: VR16 II-90 and VR16 II-360 Seam Panel

Applicable to roofs designed to IBC 2009 and newer

VR16 II-90 Seam				VR16 II-360 Seam				
Panel Span (Ft.)	24 ga.	22 ga.		Panel Span (Ft.)	24 ga.		22 ga.	
	All Roof Areas (psf)	Mid-Field (psf)	Edge Strip & Corner Zone* (psf)		Mid-Field (psf)	Edge Strip & Corner Zones* (psf)	Mid-Field (psf)	Edge Strip & Corner Zones* (psf)
2	75.6	107.9	107.9	2	115.1	115.1	135.8	135.8
2.5	68.4	95.2	97.5	2.5	97.8	97.8	122.1	122.1
3	63.9	89.8	97.5	3	87.8	87.8	113.0	113.0
3.5	59.3	84.4	97.5	3.5	77.9	77.9	103.8	106.8
4	54.8	79	97.5	4	68.0	68.0	94.7	106.8
4.5	50.3	73.6	97.5	4.5	58.1	64.0	85.6	106.8
5	45.7	68.2	97.5	5	48.2	64.0	76.5	106.8

- \*: 1. The tabulated values are the results of ASTM E1592 tests.  
 2. Engineers must check the tabulated values against fastener pullout and tension listed below.  
 3. If VR16 II-360 seam is required in edge/corner zones, the standard is to use this seam for the entire roof plane. This is an architectural consideration.

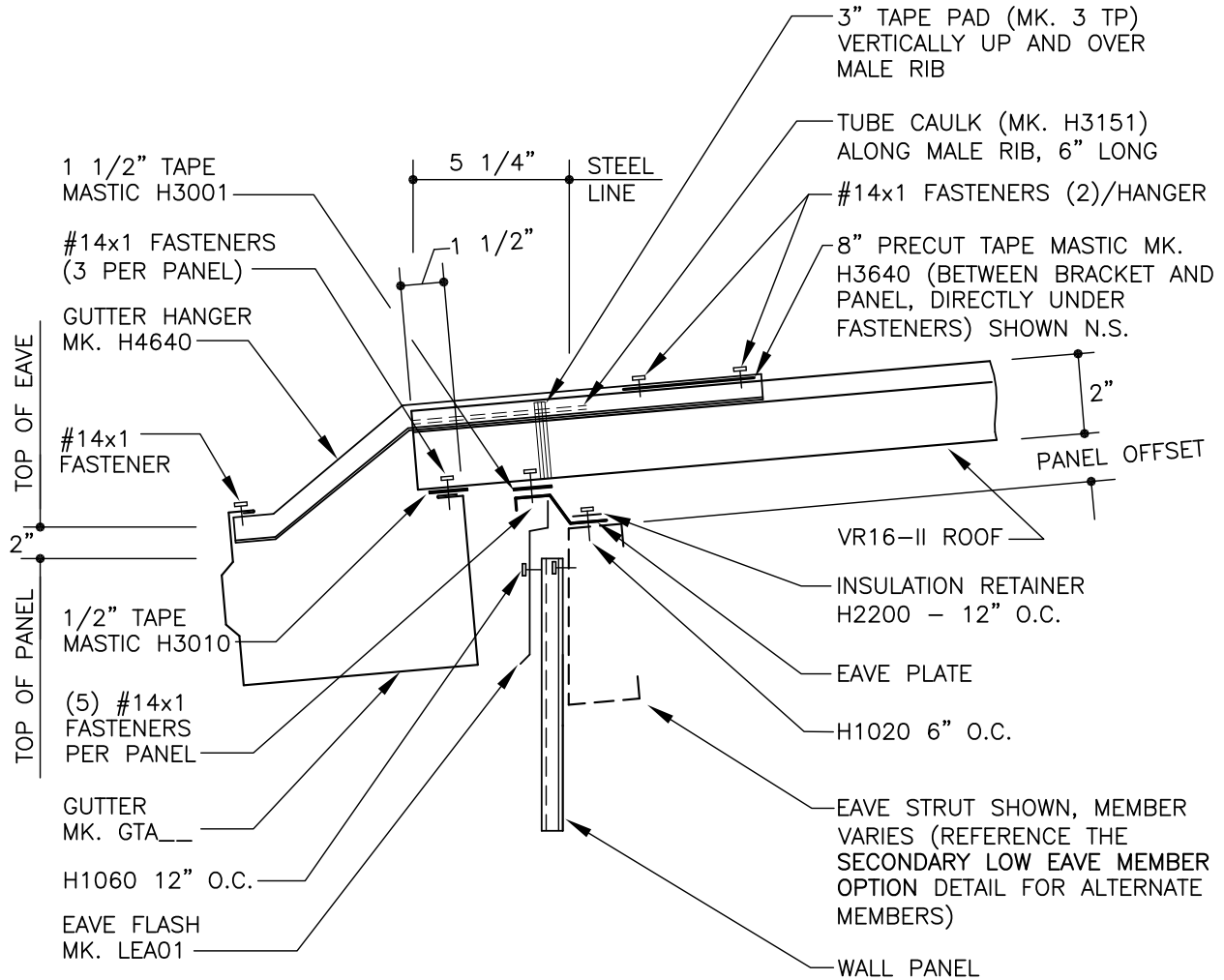
## Allowable Screw Pullout for (2) #12 Screws per VR16 II Clip (psf)

Panel Span (Ft.)	Purlin Design Thickness (in.)					
	0.060	0.075	0.089	0.099	0.105	0.120
2	188	235	279	310	329	376
2.5	150	188	223	248	263	301
3	125	157	186	207	219	251
3.5	107	134	159	177	188	215
4	94	117	139	155	164	188
4.5	84	104	124	138	146	167
5	75	94	111	124	132	150



## STANDARD DETAILS

### ED3010PE - GUTTER



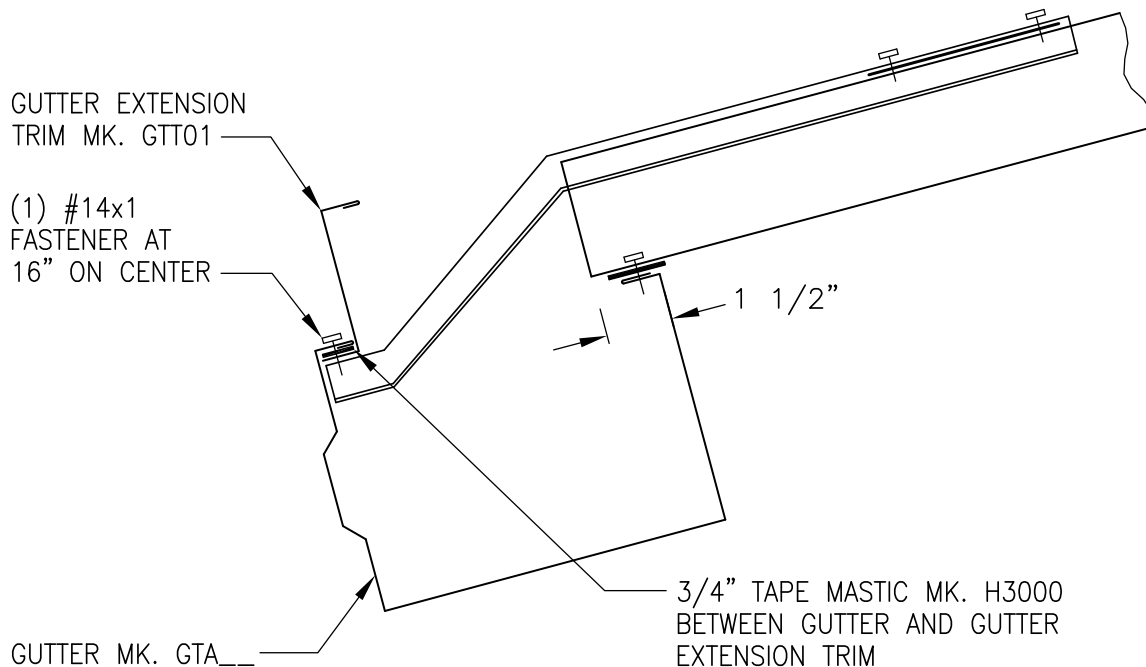
## EAVE GUTTER DETAIL

- Standard gutter bracket spacing is 32", 16" available.
- Gutter brackets match roof color unless specified otherwise.
- Tube sealant is the critical weather-tightness detail.
- Standard roll-formed roofline trim used. Same as other roof panels.
- Panel overhang dimension will increase above 4:12 roof slope.
- Gutter extension trim available to hide inside wash-coat of gutter if necessary. See next page.
- No cinch strap is used at the eave.



## ED3005PE - GUTTER EXTENSION TRIM

IT IS RECOMMENDED THAT THE GUTTER EXTENSION TRIM BE TEMPORARILY ATTACHED TO THE GUTTER WITH POP RIVETS (MK. H1100) BEFORE THE GUTTER IS INSTALLED.

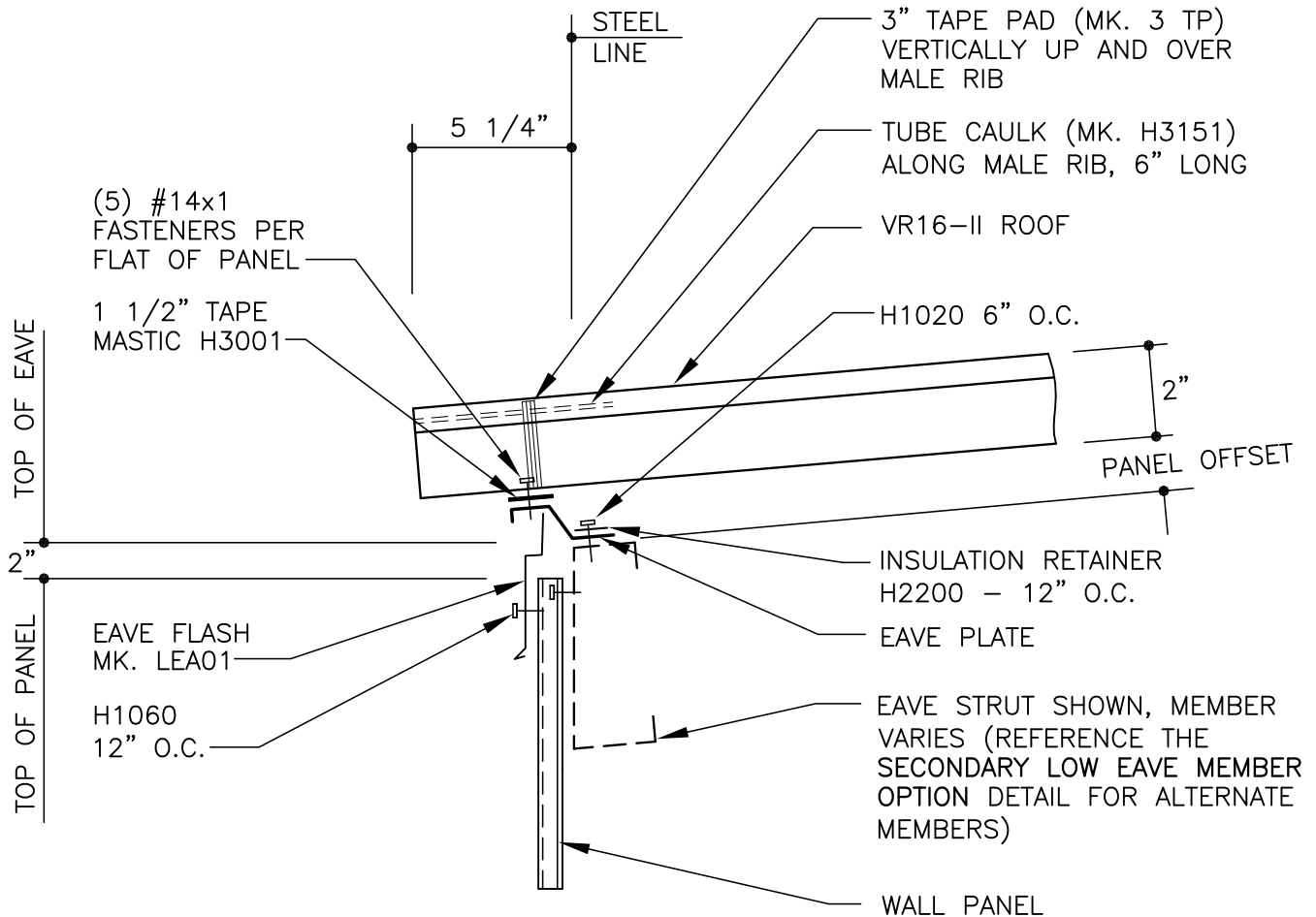


## GUTTER EXTENSION TRIM DETAIL

- This is an optional piece. Can be used on any slope, but recommended above 2:12.
- Gutter extension trim is flush with the top of the roof panel, and matches the gutter color.
- The mastic between the gutter and the extension trim is used for ease of installation. Place the tape mastic on the gutter extension trim, press it on the gutter and both pieces can be installed at the same time. Pop rivets can be used to hold the pieces together also, if desired.
- Hides the inside wash-coat of the gutter.
- Hides the end of the panel.
- Helps gain gutter capacity back from the gutter being on slope.
- The ends of the gutter are the overflow system.



## EB3010PE - SIMPLE EAVE



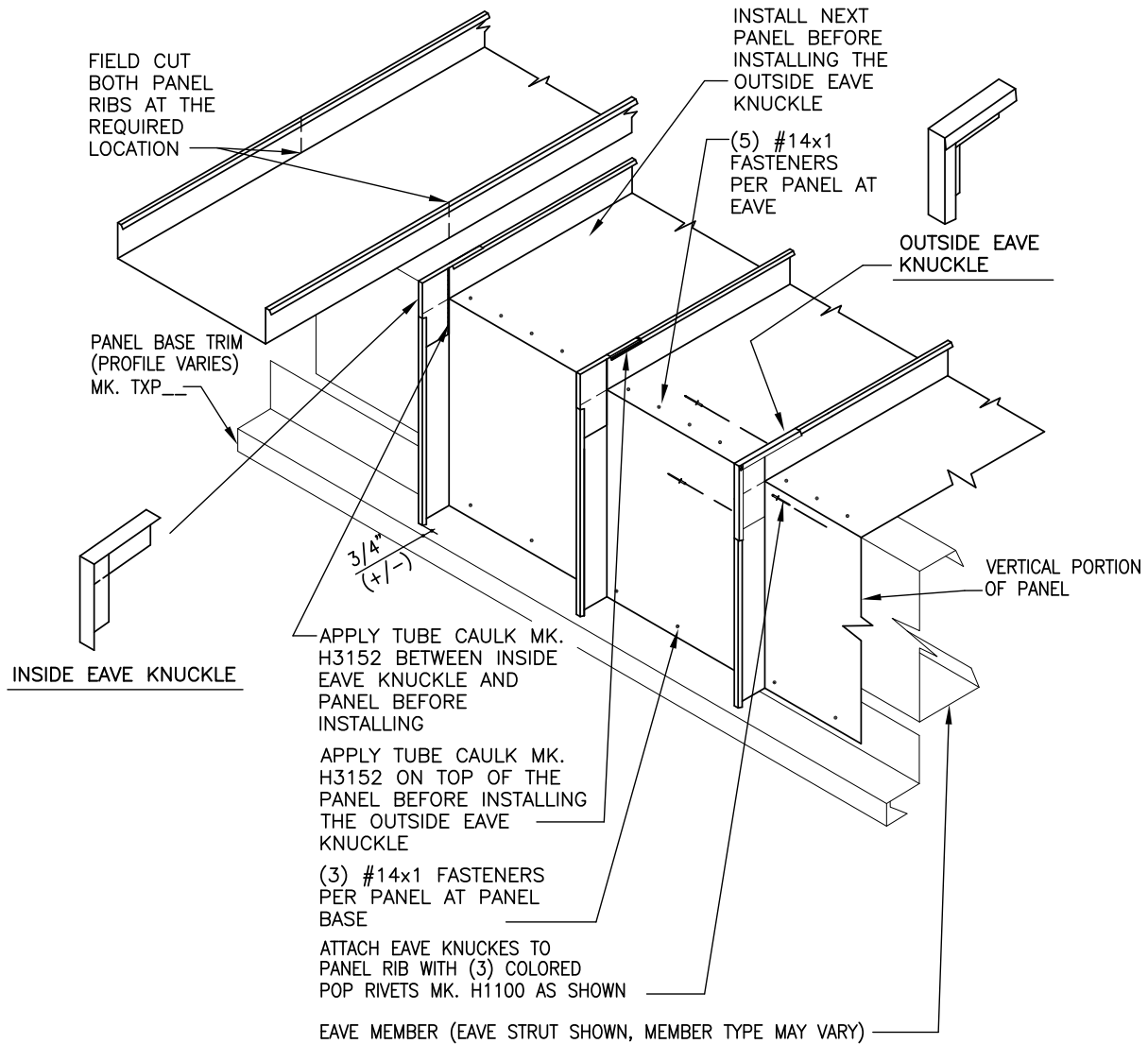
## SIMPLE EAVE DETAIL

- Same detail as our other roof types.
- There are no holes in the end of the panel.
- No cinch strap is used at the eave.



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## ER3010PE - EAVE KNUCKLE



### EAVE KNUCKLE DETAIL

- Inside and Outside Knuckle trims are standard NBS parts.
- All panel work is done in the field.
- Gutter not allowed with use of the eave knuckle.
- Eave plate may or may not be necessary with use of the eave knuckle.
- The VR16 II-360 seam **is not** available with an Eave Knuckle.

LAST REVISION  
DATE: 08/06/19  
BY: EGB CHK: KMC

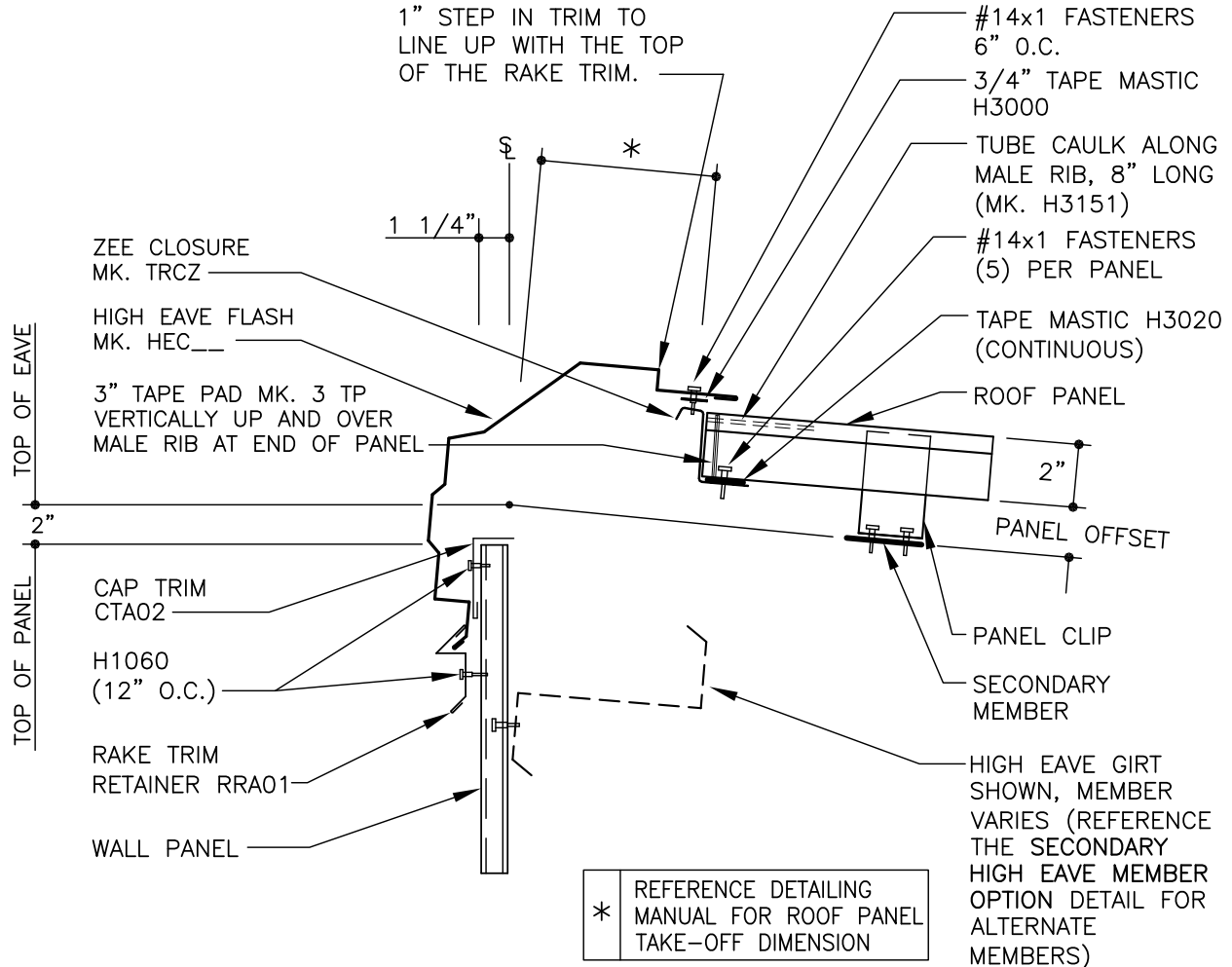
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## EH3006PE - HIGH EAVE SCULPTURED



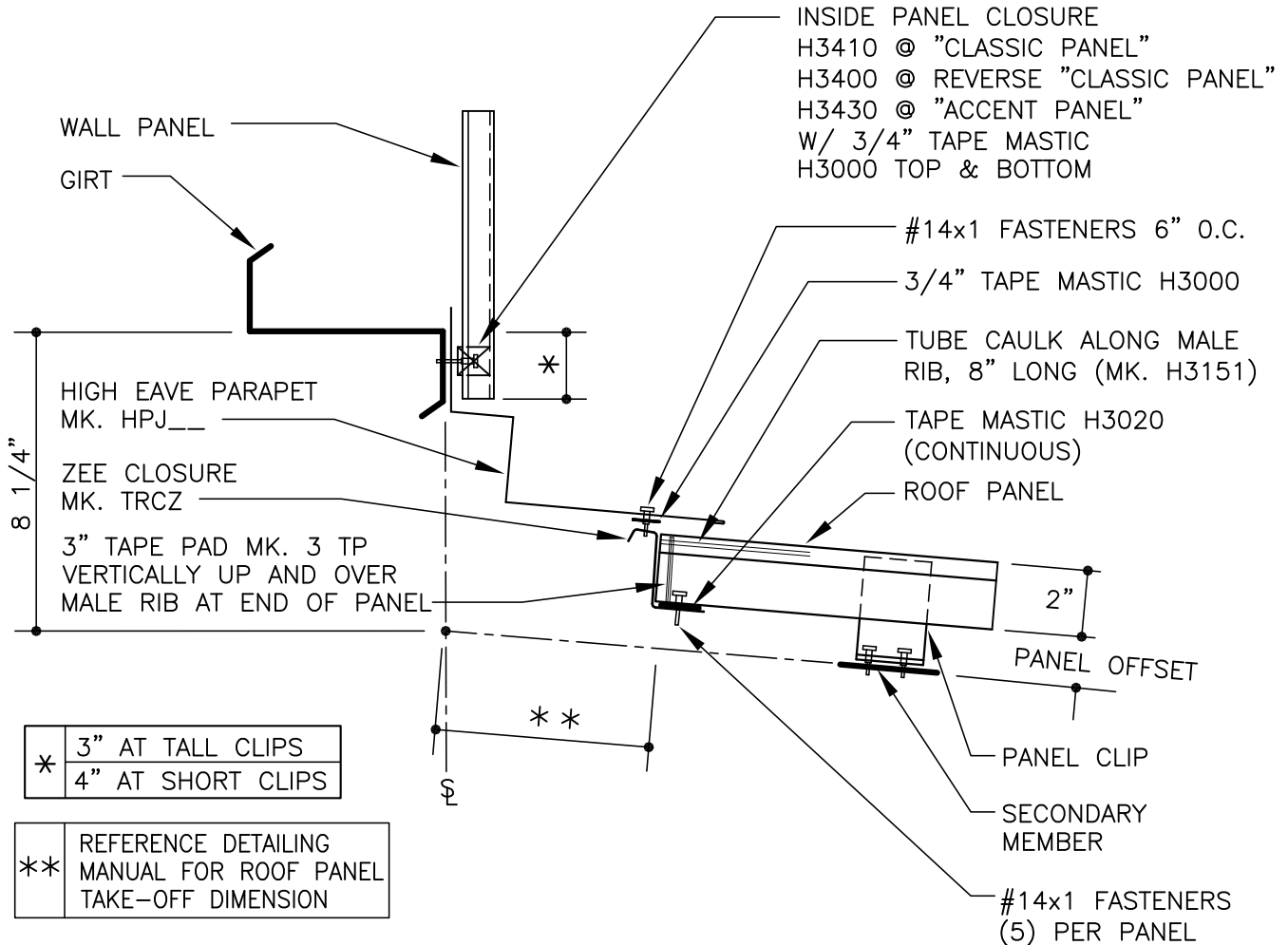
## SCULPTURED HIGH EAVE DETAIL

- The high eave sculptured trim is a new part specific for NUCOR VR16 II™. It has a 1" step so that the top of the trim lines up with the top of the rake trim.
- The ridge closure zee is made from 16 gage galvanized material. On painted roofs, a 26 gage roof color cover flash is provided.
- The ridge closure zee is provided 15'-2" lengths.
- Self-drilling screws are used to attach the ridge closure zee to the roof panel.



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## EI3010PE - HIGH EAVE PARAPET



## HIGH EAVE PARAPET DETAIL

- The high eave parapet trim is a new part specific for NUCOR VR16 II™. We modified the height of the step in the trim so that the top of the parapet trim lines up with the top of the rake trim.
- The ridge closure zee is made from 16 gage galvanized material. On painted roofs, a 26 gage roof color cover flash is provided.
- The ridge closure zee is provided 15'-2" lengths.
- Self-drilling screws are used to attach the ridge closure zee to the roof panel.

LAST REVISION  
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BY: EGB CHK: AES

DETAIL NAME IF APPLICABLE  
[EI3010PE.dwg](#)

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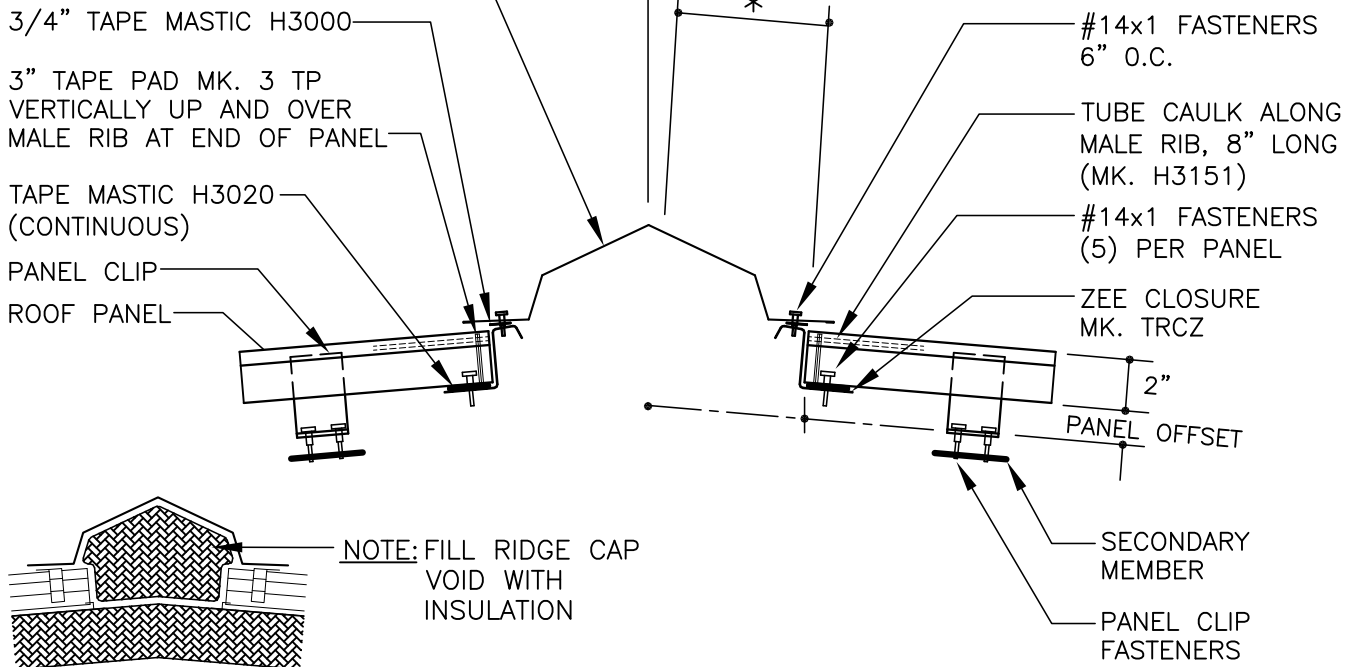


# PRODUCT & ENGINEERING MANUAL

## EG3050PE - STANDARD RIDGE

RIDGE CAP OPTIONS	
ROOF SLOPE	MARK NUMBER
$\leq 2:12$	RGC__
$> 2:12$ & $\leq 4:12$	RGE__

\* REFERENCE DETAILING MANUAL FOR ROOF PANEL TAKE-OFF DIMENSION



## STANDARD RIDGE DETAIL

- This is similar to the CFR ridge cap. It is required at roof slopes less than 4:12 and panel runs greater than 35'. We need this trim to allow for the thermal expansion and contraction of the roof panel. A low profile ridge cap is also available. See the next page for specifics.
- The ridge closure zee is made from 16 gage galvanized material. On painted roofs, a 26 gage roof color cover flash is provided.
- The ridge closure zee is provided 15'-2" lengths.
- Self-drilling screws are used to attach the ridge closure zee to the roof panel.

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 BY: DBA CHK: EGB

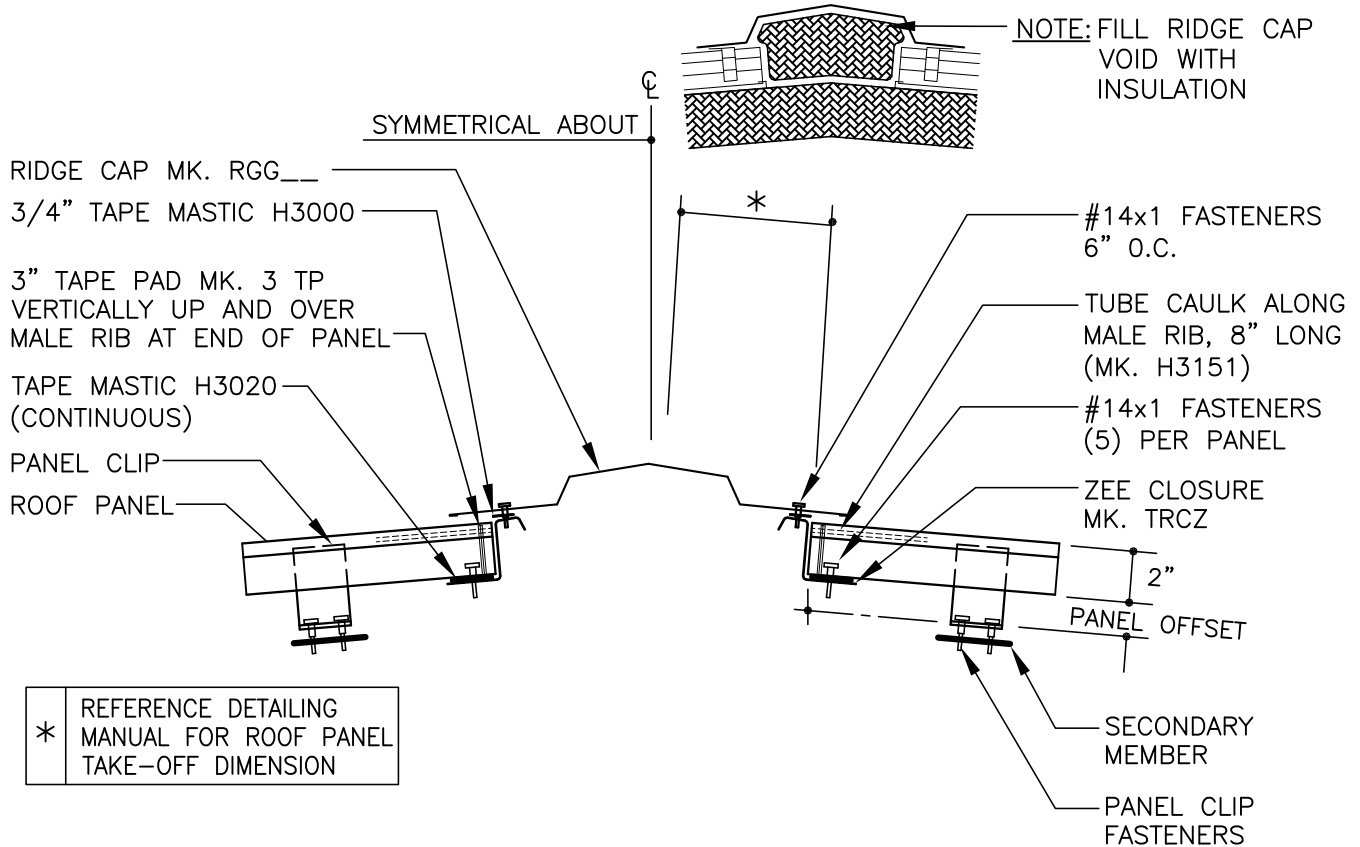
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## EG3250PE - LOW PROFILE RIDGE



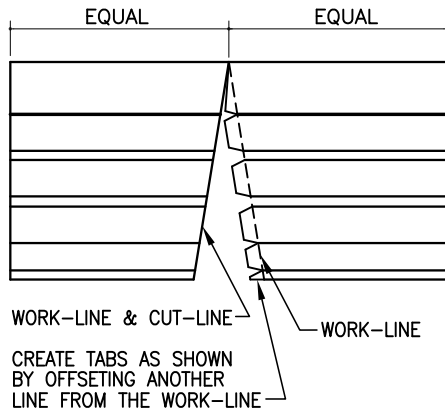
## LOW PROFILE RIDGE DETAIL

- This is only allowed at roof panel runs less than 35' and roof slope of 4:12 and steeper. The step in the trim is 1" so that it lines up with the top of the rake trim.
- The ridge closure zee is made from 16 gage galvanized material. On painted roofs, a 26 gage roof color cover flash is provided.
- The ridge closure zee is provided 15'-2" lengths.
- Self-drilling screws are used to attach the ridge closure zee to the roof panel.

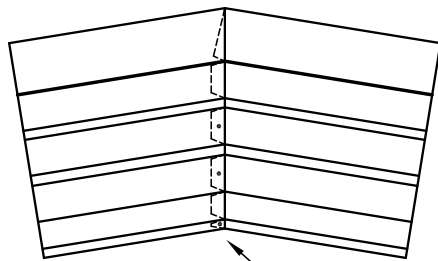


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## EG2100PE - FIELD FABRICATED METAL PEAK BOX



WORK-LINE & CUT-LINE  
WORK-LINE  
CREATE TABS AS SHOWN BY OFFSETTING ANOTHER LINE FROM THE WORK-LINE



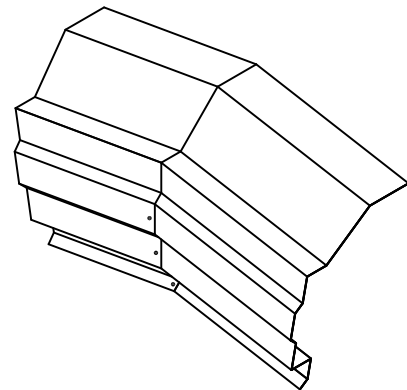
BEND ALONG THE TOP HORIZONTAL LEG AND POP RIVET TOGETHER AS NECESSARY

FRONT VIEWS  
OF ASSEMBLY PROCESS

**IMPORTANT NOTE**

DO NOT ATTACH THE PEAK BOX TO THE RAKE TRIM OR THE ROOF PANEL. THE RAKE TRIM MUST BE ALLOWED TO FLOAT WITH THERMAL EXPANSION AND CONTRACTION, SEPARATE FROM THE PEAK BOX.

SEE THE ROOF SHEETING ERECTION MANUAL FOR ADDITIONAL PARTS REQUIRED AT THIS LOCATION.

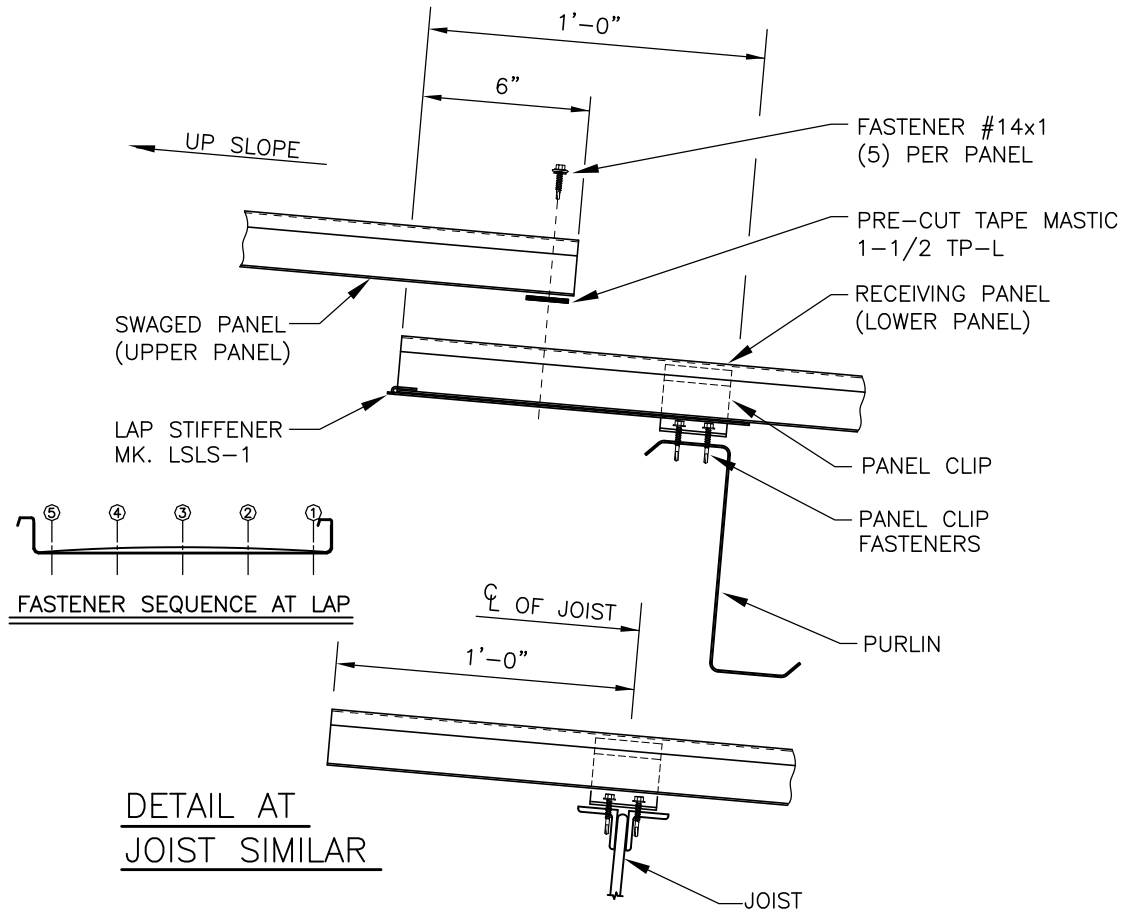


ISOMETRIC VIEWS  
OF FINISHED ASSEMBLY

### FIELD-FABRICATED PEAK BOX INSTRUCTIONS

- The customer has the option of purchasing the metal peak boxes or field fabricating a metal peak box out of a piece of standard rake trim.
- The standard metal peak boxes work up through 6:12 roof slope, and only available in white.
- The standard CAD detail for the field fabricated metal peak box shows a lot more information on how to fabricate this.
- The metal peak box, as shown in the detail, allows the rake trim to slide as it is designed to. Field mitering the rake trim together at the peak with sliding clips is not recommended.
- It takes anywhere from 30-60 minutes to field fabricate one of these metal beak boxes.

## EA3021PE - END LAP



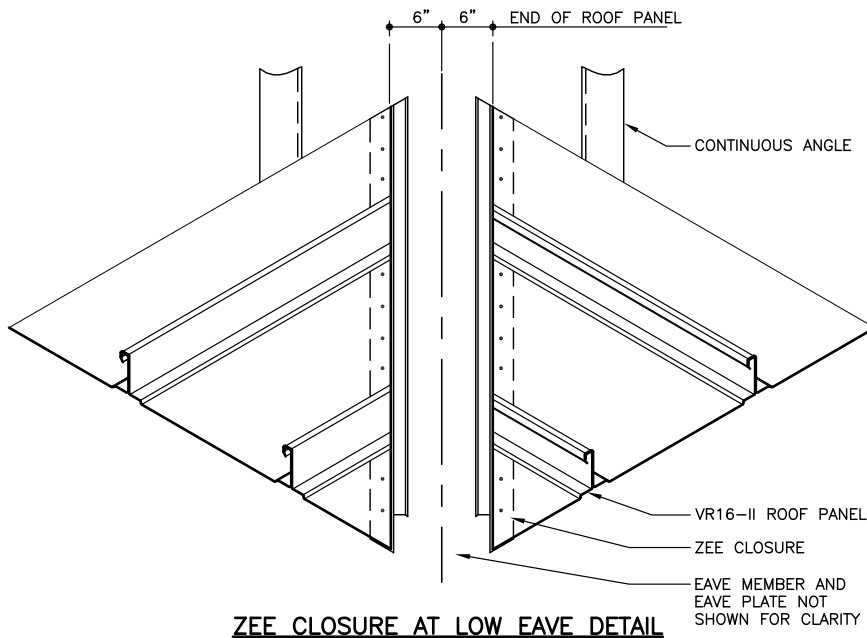
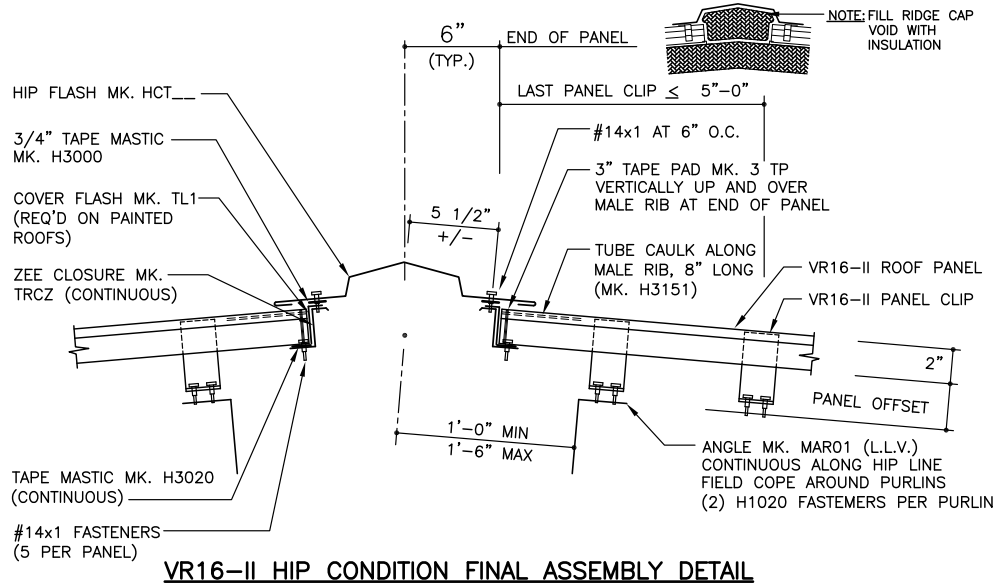
## VR16-II PANEL SPLICE

- Striated Panels are the only panel option on buildings with endlaps. No Pencil Rib panel.
- The panel cantilever dimensions at the end lap are the same as the CFR panel.
- Five self-drilling screws are used. The panels are not pre-punched.
- No cinch strap is used at the end lap.
- Pre-cut tape mastic and butyl tube caulk are used at the panel splice.
- The lap stiffener is made from 16 gage pre-painted steel. There is one lap stiffener per panel.
- As a standard, swaging of the upper panel is required.



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## EP3021PE - HIP – STANDARD



- This hip flash will be used at longer roof runs where there are more concerns about thermal expansion and contraction.
- The ridge closure zee is made from 16 gage galvanized material. On painted roofs, a 26 gage roof color cover flash is provided.
- The ridge closure zee is provided 15'-2" lengths.
- Self-drilling screws are used to attach the ridge closure zee to the roof panel.

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BY: DBA CHK: EGB

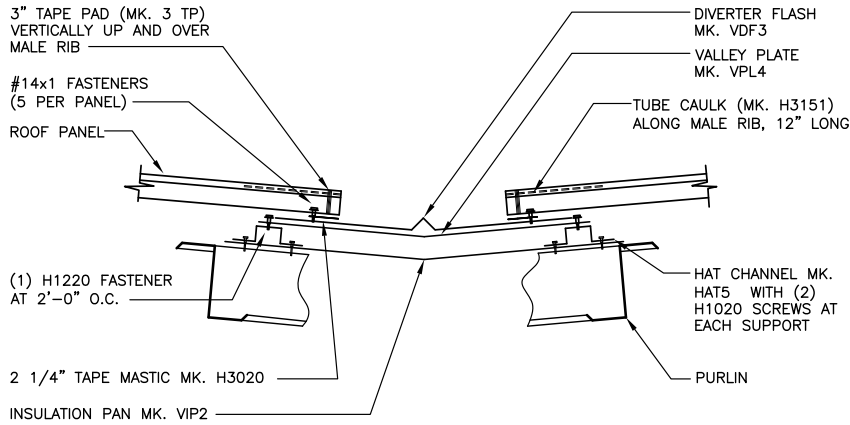
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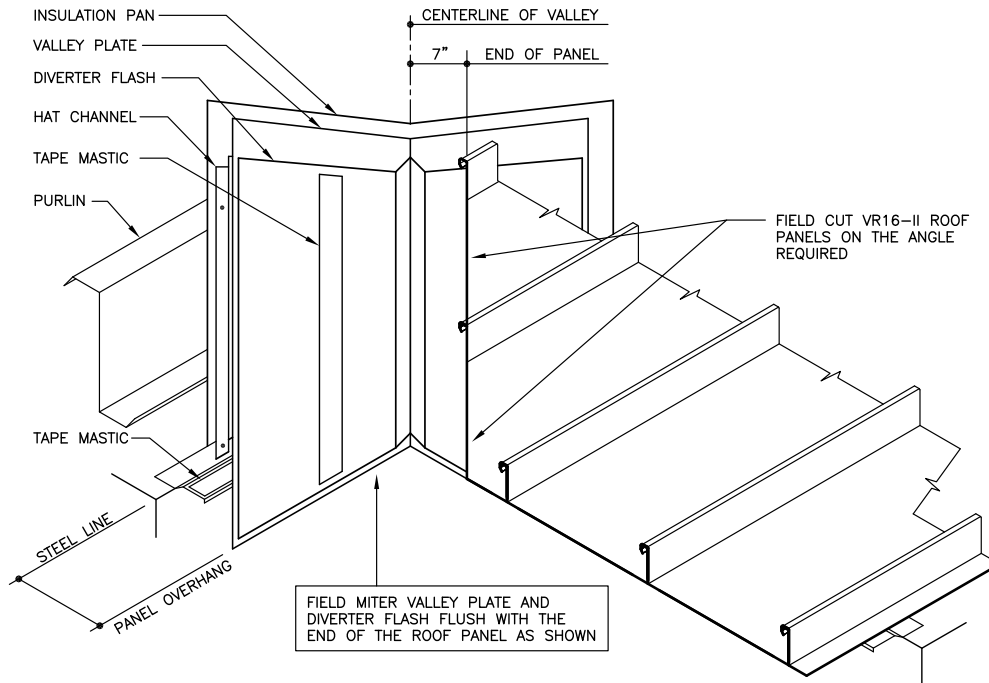


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## EP3040PE - VALLEY



### VR16-II VALLEY FINAL ASSEMBLY DETAIL



### ROOF PANEL CUT DETAIL

- Again, this is basically the same as CFR, but simpler.
- Minimum 1/2:12 roof sloped required for valley.

LAST REVISION  
DATE: 12/30/08  
BY: EGB CHK: AES

DETAIL NAME IF APPLICABLE  
[EP3040PE.dwg](#)

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