TABLE OF CONTENTS

BUILD BETTER

BORGA

STEEL BUILDINGS & COMPONENTS

VERTICAL LOCK - Product Data Sheet

Vertical Lock is an architectural panel system, easily installed over open framing as well as solid substrate. A concealed clip allows the panel system to float freely over the deck with thermal movements. The individual panels snap together for ease of installation. Vertical Lock is available in a variety of panel gauges, widths and colors, including high-end materials and finishes, with matching trim that will make an architectural statement in any application.
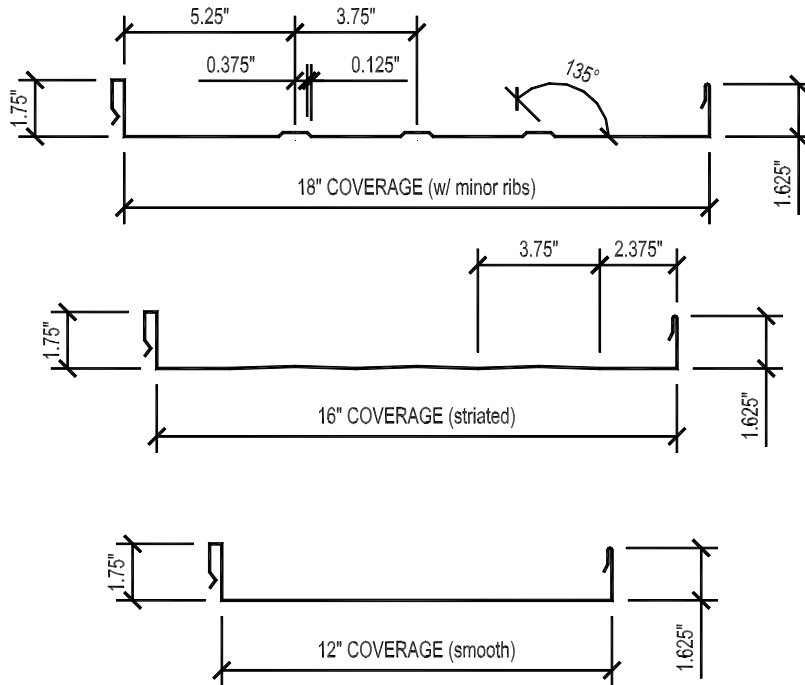
PANEL OPTIONS

Panel widths:	18"; 12" and 16" available upon request
Panel configurations:	Smooth, Striated or Minor Ribs. Factory notching available
Panel lengths:	Up to 40 ft. Please inquire for longer lengths
Roof slope:	Minimum 3:12 (recommended)
Gauge:	22, 24 or 26
Substrate:	Galvalume® or Galvanized steel
Paint system:	SMP or Kynar® 500/Hylar 5000®

Borga, Inc. 1/2008 Subject to change without notice   2

Office phone (559) 834-5375 - Office fax (559) 834-1406
300 West Peach St. - P.O. Box 35 - Fowler, CA 93625
www.borgasteel.com

			Top in Compression			Bottom in Compression		
GA.	WT. (PSF)	Fy (KSI)	Ix (IN^4/FT)	Se (IN^3/FT)	Ma (K-IN/FT)	Ix (IN^4/FT)	Se (IN^3/FT)	Ma (K-IN/FT)
26								
24	1.25	50	0.0321	0.0403	1.2066	0.0682	0.0465	1.3906
22	1.60	50	0.0446	0.0594	1.7795	0.0950	0.0655	1.9607

Engineering Properties of Vertical Lock Panels

26 GUAGE (Fy = 50 ksi)

	Allowable Uniform Live Loads (lbs/ft^2)						
	Span in Feet						
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single							
2-Span							
3-Span							
4-Span							

24 GUAGE (Fy = 50 ksi)

	Allowable Uniform Live Loads (lbs/ft^2)						
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single	148.3	103.0	75.7	57.9	45.8	37.1	30.6
2-Span	128.7	89.4	65.7	50.3	39.7	32.2	26.6
3-Span	160.9	111.7	82.1	62.8	49.7	40.2	33.2
4-Span	150.2	104.3	76.6	58.7	46.4	37.6	31.0

22 GUAGE (Fy = 50 ksi)

	Allowable Uniform Live Loads (lbs/ft^2)						
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single	200.0	145.2	106.7	81.7	64.5	52.3	43.2
2-Span	189.8	131.8	96.8	74.1	58.6	47.5	39.2
3-Span	200.0	164.8	121.1	92.7	73.2	59.3	49.0
4-Span	200.0	153.8	113.0	86.5	68.4	55.4	45.8

NOTES
1. Allowable loads are based on uniform span lengths and Fy = 50 KSI.
2. Live Load is limited by bending, shear, and combined bending and shear.
3. Maximum deflection ration is L/180.
4. The weight of the panel has not been deducted from allowable loads.
5. **LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT.**

BORGA
STEEL BUILDINGS & COMPONENTS

3.75"   2.375"

1.75"

16" COVERAGE (striated)

1.625"

Engineering Properties of Vertical Lock Panels								
GA.	WT. (PSF)	Fy (KSI)	Top in Compression			Bottom in Compression		
			Ix (IN^4/FT)	Se (IN^3/FT)	Ma (K-IN/FT)	Ix (IN^4/FT)	Se (IN^3/FT)	Ma (K-IN/FT)
26								
24	1.34	50	0.0353	0.0452	1.3527	0.0758	0.0519	1.5563
22	1.71	50	0.0500	0.0665	1.9938	0.1052	0.0731	2.1906

26 GUAGE (Fy = 50 ksi)

Allowable Uniform Live Loads (lbs/ft^2)							
Span in Feet							
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single							
2-Span							
3-Span							
4-Span							

24 GUAGE (Fy = 50 ksi)

Allowable Uniform Live Loads (lbs/ft^2)							
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single	166.0	115.3	84.7	64.8	51.2	41.5	34.3
2-Span	144.3	100.2	73.6	56.4	44.5	36.1	29.8
3-Span	180.4	125.3	92.0	70.5	55.7	45.1	37.3
4-Span	168.4	116.9	85.9	65.8	52.0	42.1	34.8

22 GUAGE (Fy = 50 ksi)

Allowable Uniform Live Loads (lbs/ft^2)							
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single	200.0	162.3	119.2	91.3	72.1	58.4	48.3
2-Span	200.0	147.7	108.5	83.1	65.6	53.2	43.9
3-Span	200.0	184.6	135.6	103.8	82.0	66.5	54.9
4-Span	200.0	172.4	126.6	97.0	76.6	62.1	51.3

NOTES
1. Allowable loads are based on uniform span lengths and Fy = 50 KSI.
2. Live Load is limited by bending, shear, and combined bending and shear.
3. Maximum deflection ration is L/180.
4. The weight of the panel has not been deducted from allowable loads.
5. **LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT**.

BUILD BETTER

BORGA
STEEL BUILDINGS & COMPONENTS

1.75"

12" COVERAGE (smooth)

1.625"

Engineering Properties of Vertical Lock Panels								
			Top in Compression			Bottom in Compression		
GA.	WT. (PSF)	Fy (KSI)	Ix (IN^4/FT)	Se (IN^3/FT)	Ma (K-IN/FT)	Ix (IN^4/FT)	Se (IN^3/FT)	Ma (K-IN/FT)
26								
24	1.41	50	0.0472	0.0597	1.7888	0.0952	0.0682	2.0419
22	1.81	50	0.0625	0.0850	2.5446	0.1233	0.0909	2.7222

26 GUAGE (Fy = 50 ksi)

Allowable Uniform Live Loads (lbs/ft^2)							
	Span in Feet						
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single							
2-Span							
3-Span							
4-Span							

24 GUAGE (Fy = 50 ksi)

Allowable Uniform Live Loads (lbs/ft^2)							
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single	200.0	151.3	111.1	85.1	67.2	54.5	45.0
2-Span	190.8	132.5	97.3	74.5	58.9	47.7	39.4
3-Span	200.0	165.6	121.7	93.2	73.6	59.6	49.3
4-Span	200.0	154.6	113.6	87.0	68.7	55.7	46.0

22 GUAGE (Fy = 50 ksi)

Allowable Uniform Live Loads (lbs/ft^2)							
Span Type	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Single	200.0	200.0	148.1	113.4	89.6	72.6	60.0
2-Span	200.0	188.5	138.5	106.0	83.8	67.9	56.1
3-Span	200.0	200.0	173.1	132.5	104.7	84.8	70.1
4-Span	200.0	200.0	161.6	123.7	97.8	79.2	65.5

NOTES
1. Allowable loads are based on uniform span lengths and Fy = 50 KSI.
2. Live Load is limited by bending, shear, and combined bending and shear.
3. Maximum deflection ration is L/180.
4. The weight of the panel has not been deducted from allowable loads.
5. **LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT**.

GENERAL INFORMATION

Before start of installation of the Vertical Lock panel system, the installer should thoroughly familiarize himself with all installation instructions. Be sure to read this manual in its entirety before beginning. This manual provides suggested application procedures and details only and cannot replace the use of common sense and experience by the installer. Borga accepts no responsibility for conformance to state and local building codes, nor any other applicable project requirements. This responsibility rests solely on the installer, as does the responsibility to maintain a safe work environment at all times.

The installer and/or owner is responsible for the unloading of the shipment upon arrival, and proper equipment to do so. Upon delivery, the shipment shall be checked for damages. Material quantities shall be checked against the shipping list and immediately documented and reported. Please inspect panels for moisture accumulation. If moisture has formed, the panels should be unbundled, wiped dry, and allowed to dry completely. Once dry, carefully restack the panels and loosely recover allowing for ample air circulation.

CAUTION: The installer and/or owner should be aware that additional screws may be required for high snow loading and steep slopes. In locations where heavy rainfall or sever ice and snow may occur, Borga's standard gutters may not be suitable for use. If necessary, consult a design professional for assistance.

TESTING

CLASS A – FIRE RATING

Metal is a noncombustible material and therefore holds the highest fire rating available - Class A. Therefore, many insurance companies offer discounts on fire insurance for homes with metal roofs. Please note that the fire classification of the material is not necessarily the fire classification of the entire roof; the roof will be fire rated based on all materials present, including old wood shingles if such are under the metal roofing material.

Oil canning is a natural occurrence in metal panels and is not cause for panel rejection. Prior to ordering and installing roofing panels, always check local building code requirements for additional requirements that may apply to your project. If necessary, consult a design professional for assistance.

Office phone (559) 834-5375 - Office fax (559) 834-1406
300 West Peach St. - P.O. Box 35 - Fowler, CA 93625
www.borgasteel.com

Slope
The minimum recommended slope for any Vertical Lock roofing panel is 3:12

Substrate
Vertical Lock is designed to be utilized over solid substrate, but can easily be used over an open structural frame. The recommended substrate is 5/8" plywood with a 30 pound felt* moisture barrier. To avoid panel distortion, use a properly aligned and uniform substructure.
*Depending on roof slope and roof geometry.

Coverage
Vertical Lock panels are available in a 12", 16", and 18" width with a 1 ¾" rib height.

Length
Lengths under 5'-0" are available with some cutting restrictions. Maximum recommended panel length is 45'-0". Longer panels require additional consideration in packaging, shipping, and erection. Please consult Borga for recommendations.

Availability
Vertical Seam panels are available in 26, 24, and 22 gauge. Minimum quantities may apply.

Applications
Commercial, Architectural, and Residential.

Performance Test
Coming Soon

Fastening System
Concealed Clip System

Fasteners
The fastener selection guide should be consulted for choosing proper fasteners for specific applications. Quantity and type of fastener must meet necessary loading and code requirements.

Materials
Steel grade 50, Per ASTM-A792

Finish
Galvanized G90
Acrylic Coated Galvalume (ACG)/ ASTM A-792 – AZ55
SMP over Galvalume and/or Galvanized
Kynar 500 (PVDF) over Galvalume and/or Galvanized

Borga, Inc. 1/2008 Subject to change without notice   8
Office phone (559) 834-5375 - Office fax (559) 834-1406
300 West Peach St. - P.O. Box 35 - Fowler, CA 93625
www.borgasteel.com

HANDLING

Each bundle should be handled carefully to avoid being damaged. Care should be taken to prevent bending of panel or abrasion to finish. Whenever possible, the bundle should remain crated until it is located in its place of storage. If bundles must be opened, Borga recommends you recrate them before lifting. To avoid damage, please lift the bundle at its center of gravity.

Manual Handling

When handling painted steel, care should be taken to prevent scratching of material. Clean gloves should be worn at all times to prevent reaction with salts found on bare skin. Installers should wear rubber sole shoes to keep from scuffing material while walking on the roof.

Handling of individual panels should be done carefully and properly to avoid bending or damaging the panels. Vertical Lock panels should be carried by grasping the edge of the panel so that the panel is vertical to the ground. The panel should not be carried with the flat of the panel horizontal to the ground as this could cause the panel to buckle or bend in the center.

Normally individual panels can be handled by people placed every 6 ft to 8 ft along the length of the panel.

Mechanical Handling

Forklift – A forklift may be used for panels up to 20 ft long. Please make sure the forks are at their maximum separation. Do not transport open bundles. When transporting bundles across rough terrain, or over a longer distance, some means of supporting the panel load must be used.

Crane – A crane should be used when lifting panels with lengths greater than 20 ft. Please be sure to utilize a spreader bar to ensure the even distribution of the weight to the pick-up points. When lifting panels, no more than 1/3 of the length of the panel should be left unsupported. Never use wire rope because this will damage the panels.

CAUTION
Improper loading and unloading of bundles and crates may result in bodily harm and/or material damage. Borga is not responsible for bodily injuries and/or material damages from improper loading and unloading.

STORAGE

Please inspect panels for moisture accumulation. If moisture has formed, the panels should be unbundled, wiped dry, and allowed to dry completely. Once dry, carefully restack the panels and loosely recover allowing for ample air circulation.

Bundled sheets should be stored high enough off of the ground to allow for air circulation and prevent contact with accumulating water. If possible, elevate one end of the bundle to allow any moisture to run off the panels. Borga recommends covering the bundle with a tarpaulin. Do not use tight fitting plastic-type tarpaulins as panel bundle covers. While they may provide protection for heavy down-pours, they can also retard necessary ventilation and trap heat and moisture that may accelerate metal corrosion. If panels are to be stored in possible bad weather, it is suggested they be stored inside. Extended storage of panels in a bundle is not recommended.

Storage on Roof

To facilitate the handling of Vertical Lock panels, bundles may be lifted and placed on the roof. Loading capabilities of the roof structure must be checked. Bundles need to be placed on the roof in areas that the roof structure can handle the panel weight.

When lifting packaged sheets, make certain they are adequately supported. Panels less than 20 ft in length can normally be lifted with a forklift; however, when lifting panels in excess of 20 ft, it is recommended that a spreader bar and slings be used. No more than 1/3 of the weight of the panel should be left unsupported when lifting.

Make a plan for bundle placement by determining how much area a bundle of panels will cover. Bundles should be placed on the roof in accordance with the direction the panel will be installed. Consider where the string line, if any, is to run at the eave to set roof panels by. Roof bundles should not interfere with this string line.


CAUTION
Under no circumstances should the Vertical Lock panels be stored near or come in contact with salt water, corrosive chemicals, ash or fumes generated or released inside the building or nearby plants, foundries, plating works, kilns, fertilizer, and wet or green lumber.
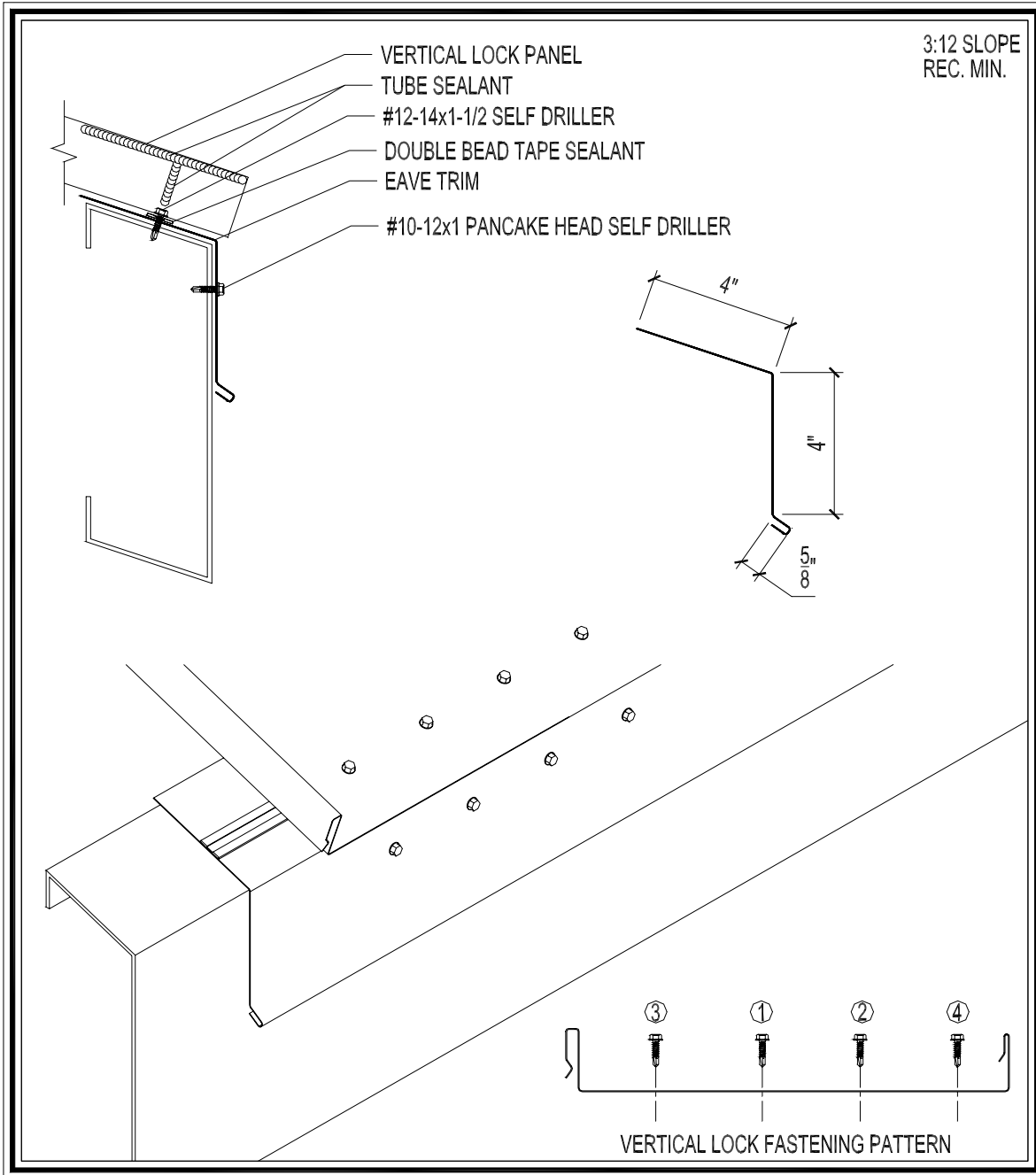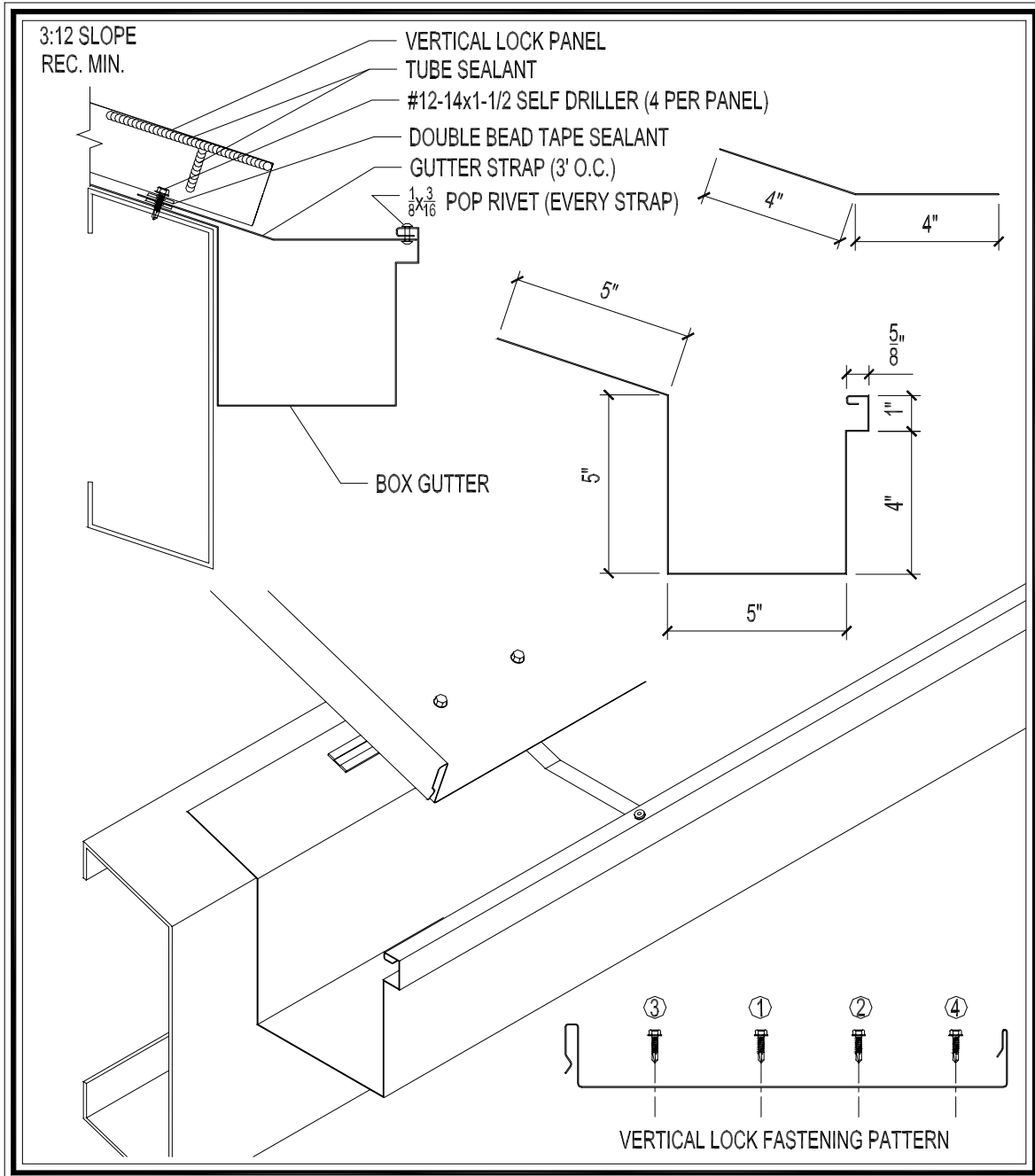

All Eave flashings must be installed prior to panel installation.
1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the substrate and fasten with #10-16x1" Pancake Head Driller (4'-0" o.c.) to hold the Eave flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant along the top leg of the Eave flashing about 2" from the end.
4. Install panel by fastening through with #12-14x1 ½" Self Driller XL screws.
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a min. of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½' o.c.
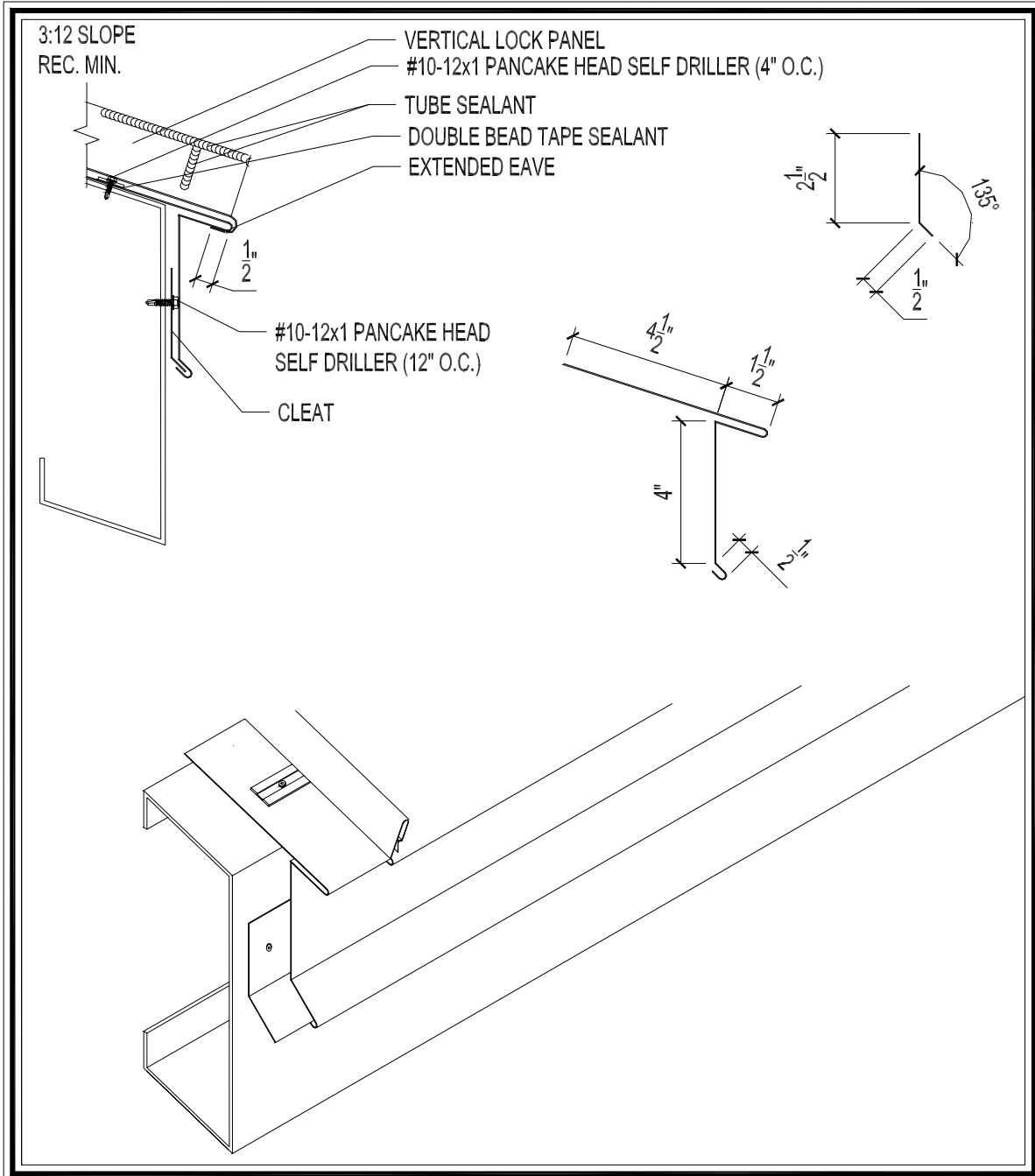
All Eave flashings must be installed prior to panel installation.
1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Extended Eave attachment.
2. Install Extended Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the substrate and fasten with #10-16x1" Pancake Head Driller (4'-0" o.c.) to hold the Extended Eave flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant to the Extended Eave flashing.
4. Install panel by fastening through with #12-14x1 ½" Self Driller XL screws.
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a min. of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½' o.c.
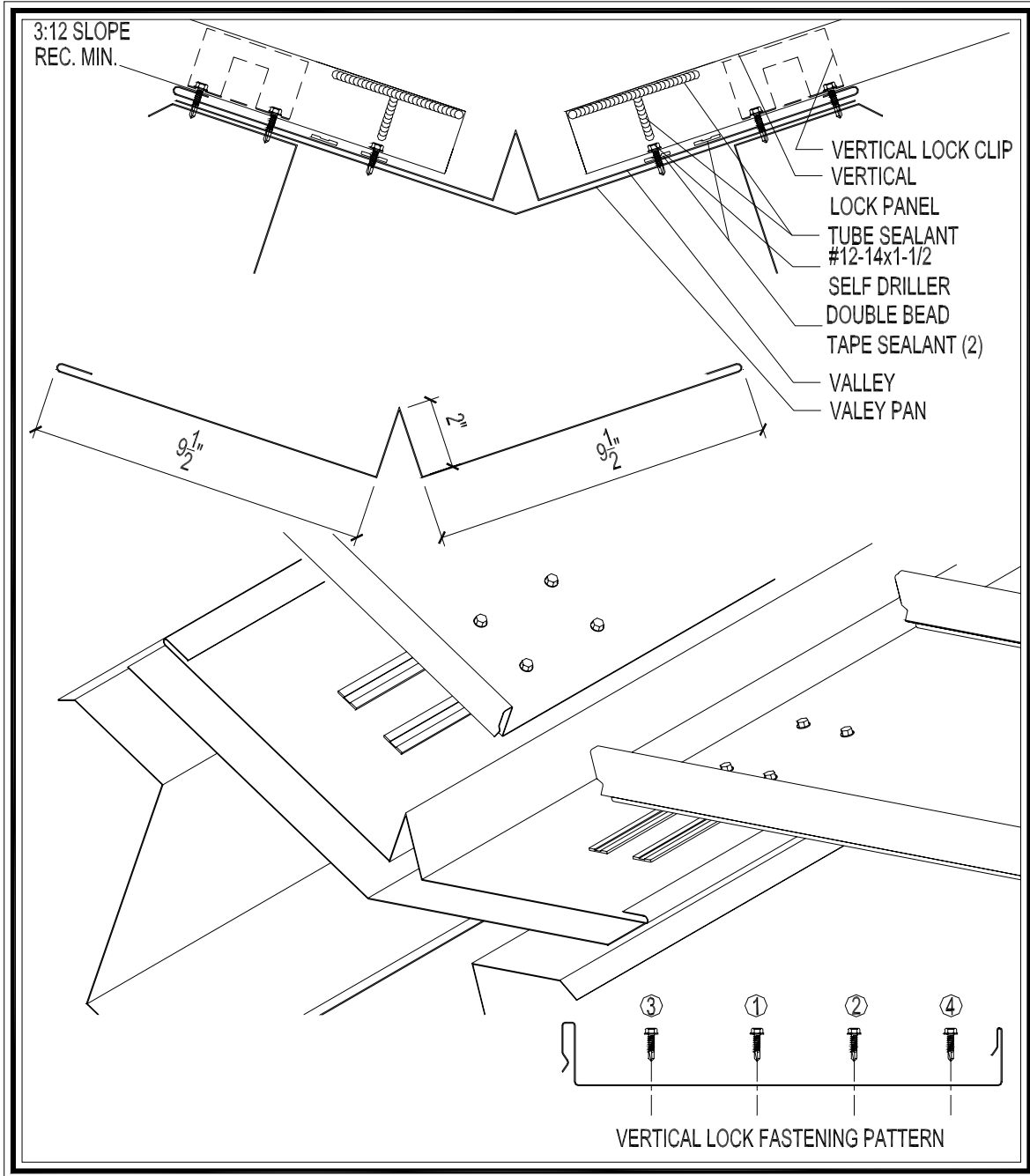
- 3:12 SLOPE REC. MIN.
- VERTICAL LOCK PANEL
- TUBE SEALANT
- #12-14x1-1/2 SELF DRILLER (4 PER PANEL)
- DOUBLE BEAD TAPE SEALANT
- GUTTER STRAP (3' O.C.)
- $\frac{1}{8}$x$\frac{3}{16}$ POP RIVET (EVERY STRAP)
- BOX GUTTER
- VERTICAL LOCK FASTENING PATTERN

All Gutter Flashings must be installed prior to panel installation.
1. Install Box Gutter flashing back against substrate. To hold Box Gutter flashing in place, fasten to substrate with #10-16x1" Pancake Head Drillers 1'-0' o.c.
2. Install Universal Gutter/Downspout Straps every 3'-0" of gutter length to substrate with #10-16x1" Pancake Head Driller, and fasten to Box Gutter with (1) Pop Rivet per strap.
3. Install panel by fastening through with #12-14x1 ½" Self Driller XL Screws.
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
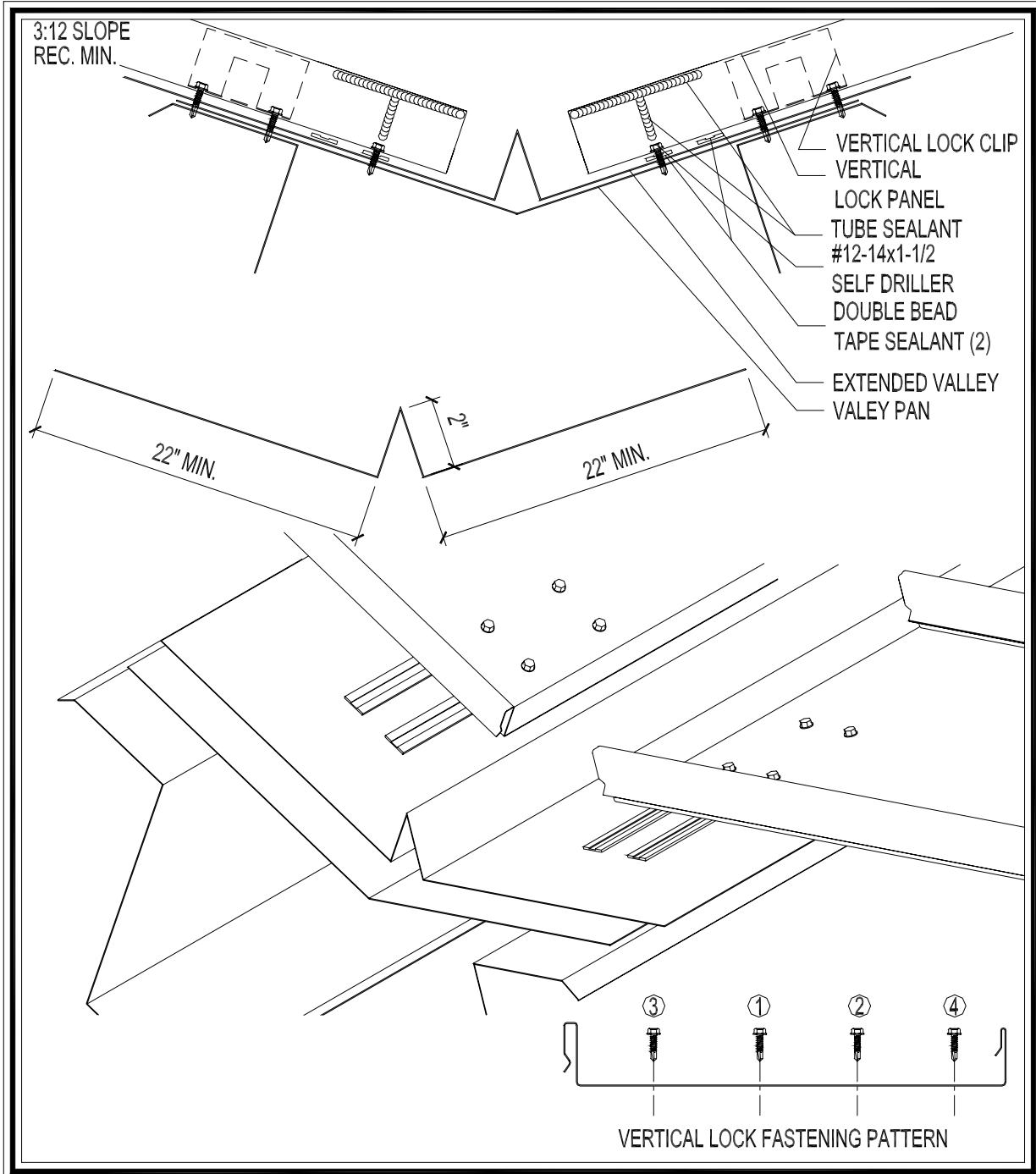
3:12 SLOPE
REC. MIN.

VERTICAL LOCK CLIP
VERTICAL
LOCK PANEL
TUBE SEALANT
#12-14x1-1/2
SELF DRILLER
DOUBLE BEAD
TAPE SEALANT (2)
VALLEY
VALEY PAN

9½"   2"   9½"

③ ① ② ④
VERTICAL LOCK FASTENING PATTERN

All Valley Flashings must be installed prior to panel installation. If two or more Valley Flashings are required, Valley must be installed working from Eave to Peak.
1. Install Valley flashing back against substrate and fasten with #10-16x1" Pancake Head Driller (1'-0'" o.c.) to hold flashing in place during installation.
2. Apply a row of Double Bead Tape Sealant across both sides of Valley flashing about 3" from the center of the valley.
3. Field cut the Vertical Lock panel to the appropriate angle and install over the Valley flashing with (5) #12-14x1 ½" Self Driller XL screws, as shown above.
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with (2) pop rivets in the 1" water diverter.
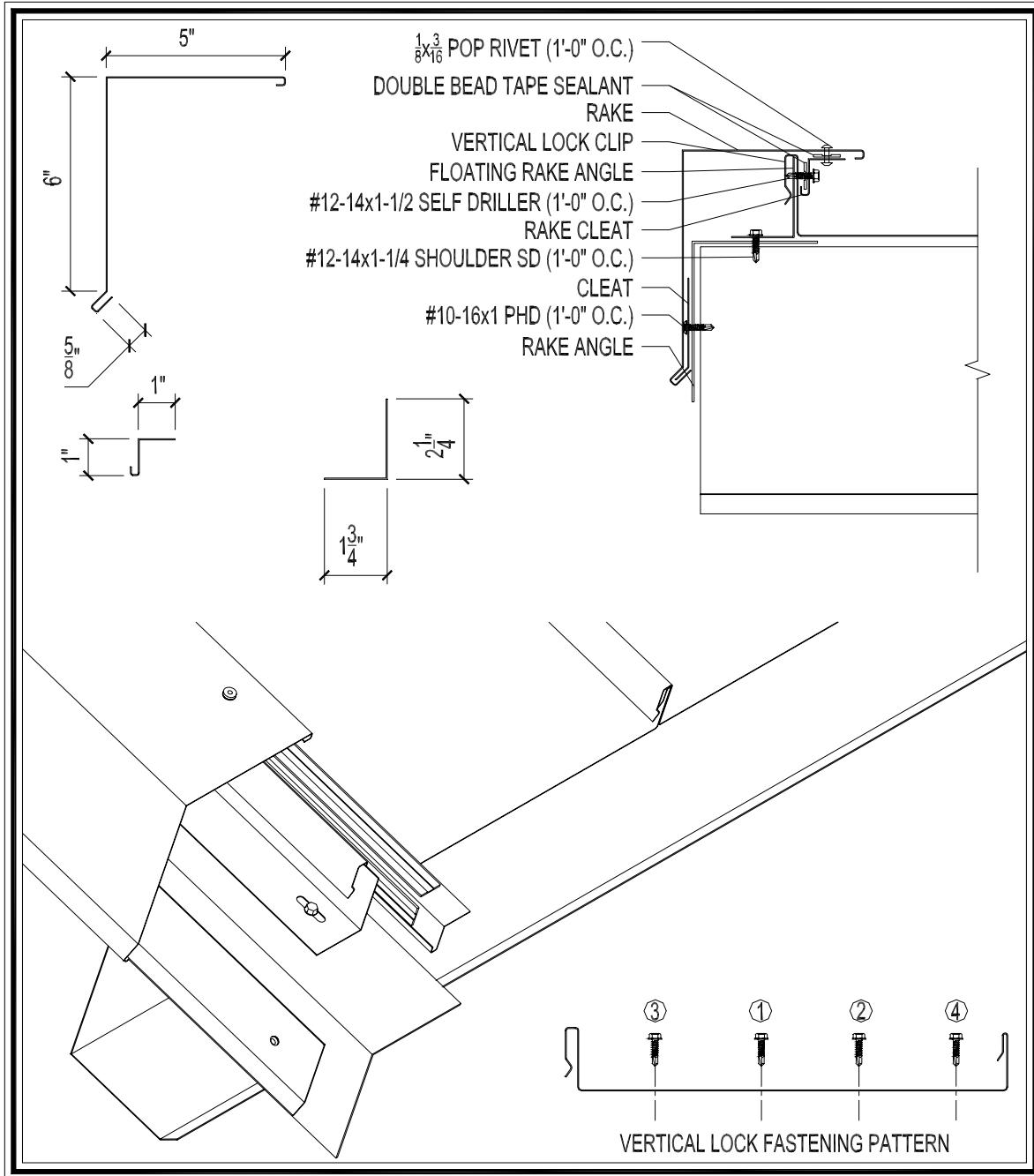
3:12 SLOPE REC. MIN.

VERTICAL LOCK CLIP
VERTICAL LOCK PANEL
TUBE SEALANT
#12-14x1-1/2 SELF DRILLER
DOUBLE BEAD TAPE SEALANT (2)
EXTENDED VALLEY VALEY PAN

22" MIN.
2"
22" MIN.

③ ① ② ④
VERTICAL LOCK FASTENING PATTERN

All Extended Valley Flashings must be installed prior to panel installation. If two or more Extended Valley Flashings are required, Extended Valley must be installed working from Eave to Peak.

1. Install Extended Valley flashing back against substrate and fasten with #10-16x1" Pancake Head Driller (1'-0'" o.c.) to hold flashing in place during installation.
2. Apply a row of Double Bead Tape Sealant across both sides of Extended Valley flashing about 3" from the center of the valley.
3. Field cut the Vertical Lock panel to the appropriate angle and install over the Extended Valley flashing with (5) #12-14x1 ½" Self Driller XL screws, as shown above.
4. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with (2) pop rivets in the 1" water diverter.
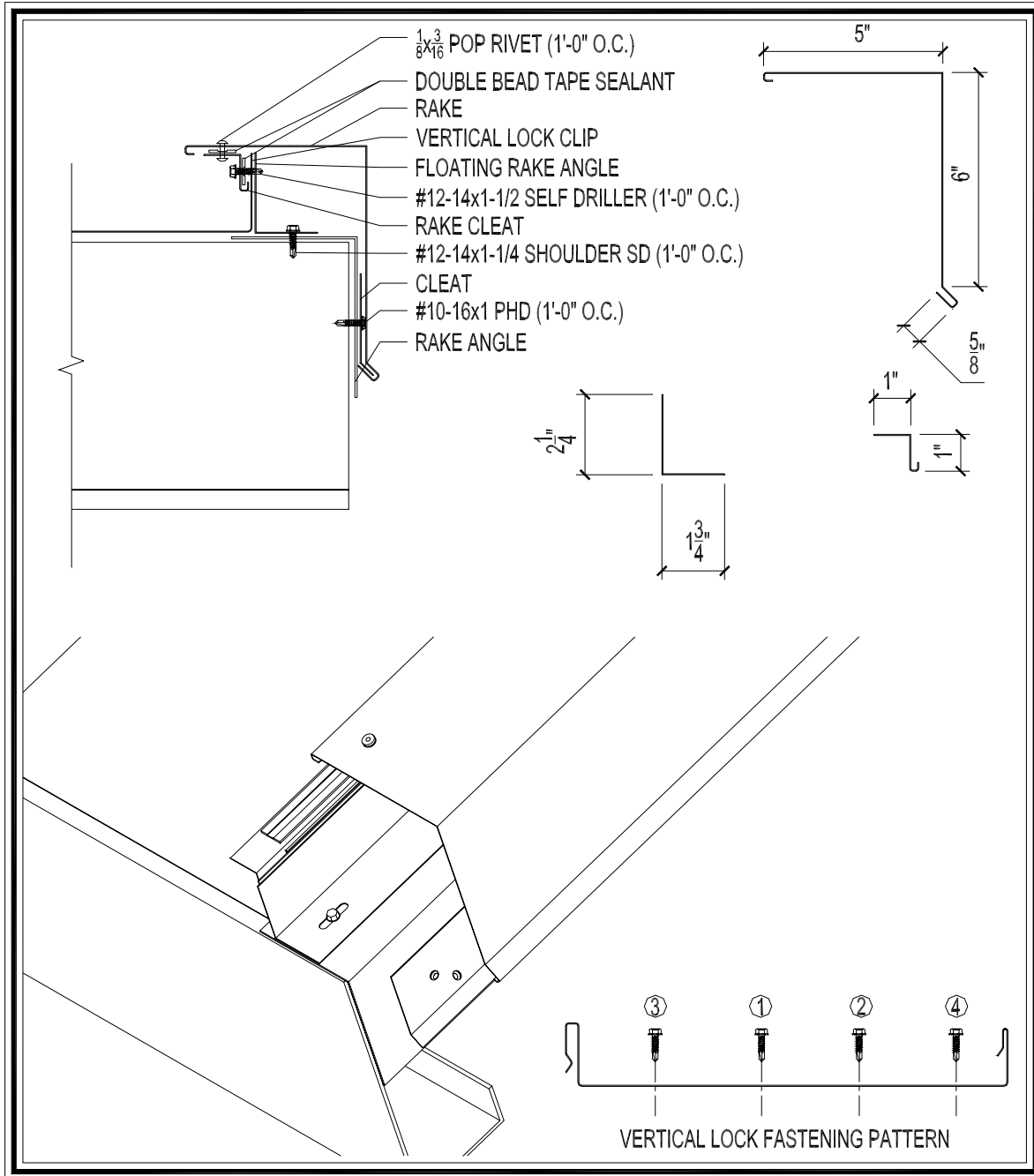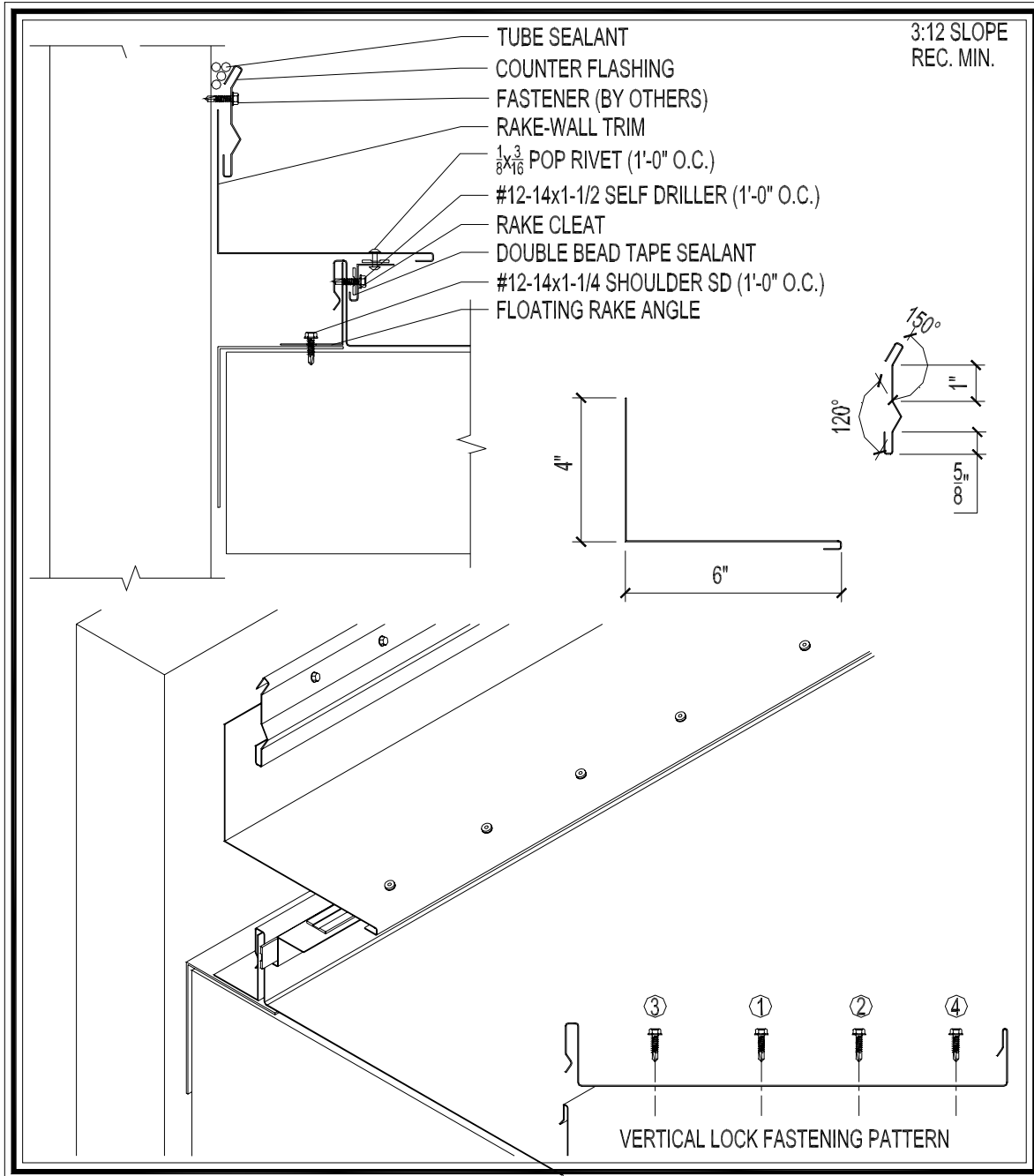
5"

6"

5/8"

1"

1"

$1\frac{3}{4}$"

$2\frac{1}{4}$"

$\frac{1}{8}$x$\frac{3}{16}$ POP RIVET (1'-0" O.C.)
DOUBLE BEAD TAPE SEALANT
RAKE
VERTICAL LOCK CLIP
FLOATING RAKE ANGLE
#12-14x1-1/2 SELF DRILLER (1'-0" O.C.)
RAKE CLEAT
#12-14x1-1/4 SHOULDER SD (1'-0" O.C.)
CLEAT
#10-16x1 PHD (1'-0" O.C.)
RAKE ANGLE

③ ① ② ④

VERTICAL LOCK FASTENING PATTERN

Vertical Lock Floating Rake Angle and Vertical Lock panels must be installed prior to rake installation.
1. Apply a row of Double Bead Tape Sealant to the vertical leg of the Vertical Lock panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14x1 ½" Self Driller XL, 1'-0" o.c.
3. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
4. Apply a row of Double Bead Tape Sealant to the top leg of Rake Cleat.
5. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

Labels:
- $\frac{1}{8}$x$\frac{3}{16}$ POP RIVET (1'-0" O.C.)
- DOUBLE BEAD TAPE SEALANT
- RAKE
- VERTICAL LOCK CLIP
- FLOATING RAKE ANGLE
- #12-14x1-1/2 SELF DRILLER (1'-0" O.C.)
- RAKE CLEAT
- #12-14x1-1/4 SHOULDER SD (1'-0" O.C.)
- CLEAT
- #10-16x1 PHD (1'-0" O.C.)
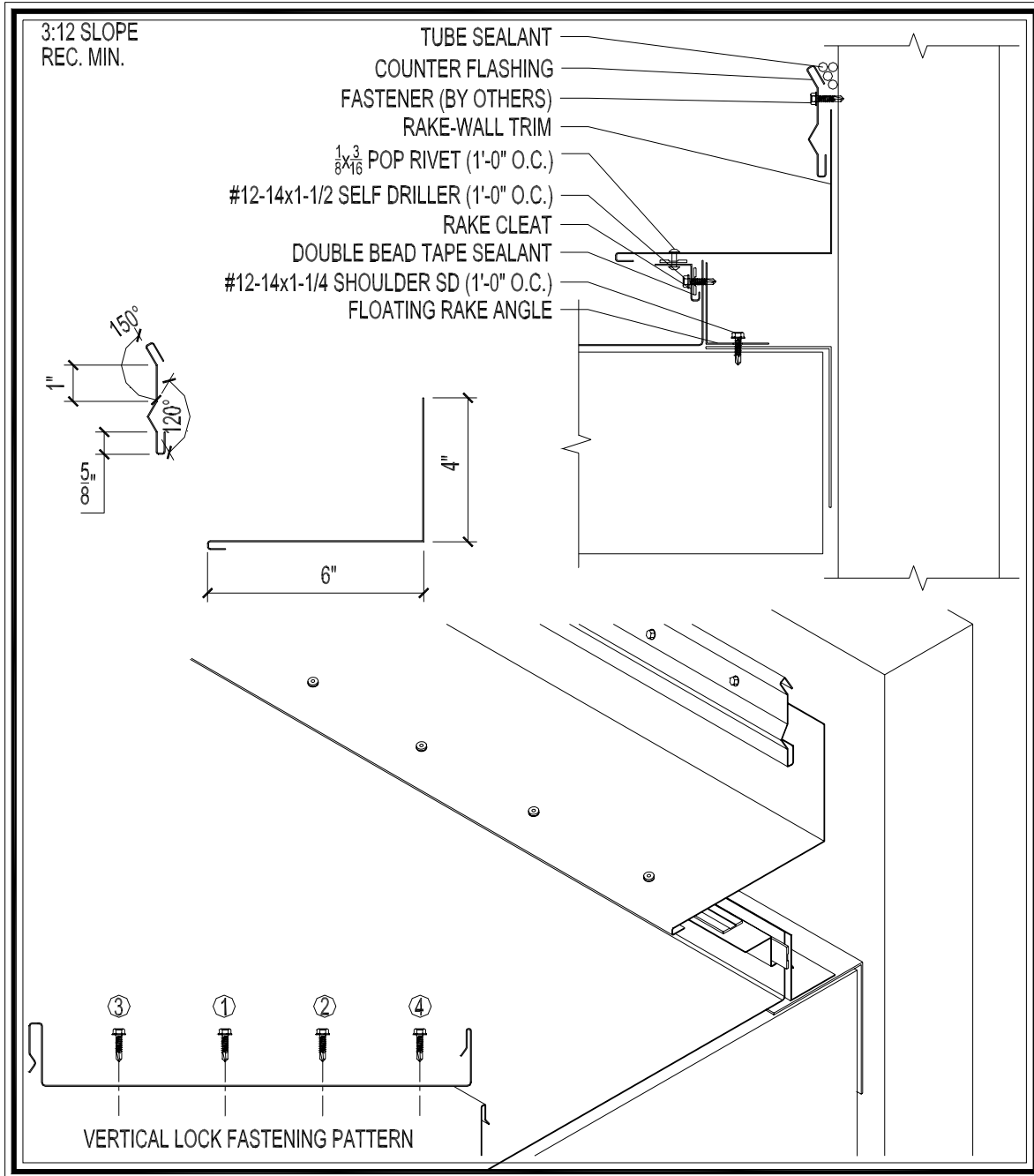- RAKE ANGLE

VERTICAL LOCK FASTENING PATTERN

Vertical Lock Floating Rake Angle and Vertical Lock panels must be installed prior to rake installation.
1. Field cut and bend off module panel up 1 ¾".
2. Apply a row of Double Bead Tape Sealant to the vertical leg of the Vertical Lock panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14x1 ½" Self Driller XL, 1'-0" o.c.
4. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
5. Apply a row of Double Bead Tape Sealant to the top leg of Rake Cleat.
6. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

Borga, Inc. 1/2008 Subject to change without notice   17

Office phone (559) 834-5375 - Office fax (559) 834-1406
300 West Peach St. - P.O. Box 35 - Fowler, CA 93625
www.borgasteel.com

TUBE SEALANT
COUNTER FLASHING
FASTENER (BY OTHERS)
RAKE-WALL TRIM
$\frac{1}{8}$x$\frac{3}{16}$ **POP RIVET (1'-0" O.C.)**
#12-14x1-1/2 SELF DRILLER (1'-0" O.C.)
RAKE CLEAT
DOUBLE BEAD TAPE SEALANT
#12-14x1-1/4 SHOULDER SD (1'-0" O.C.)
FLOATING RAKE ANGLE

3:12 SLOPE
REC. MIN.

150°
120°
1"
$\frac{5}{8}$"
4"
6"

① ② ③ ④
VERTICAL LOCK FASTENING PATTERN

Vertical Lock Floating Rake angle and Vertical Lock panels must be installed prior to Rake installation.
1. Apply a row of Double Bead Tape Sealant to the vertical leg of the Vertical Lock panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14x1 ½" Self Driller XL, 1'-0" o.c.
3. Apply a row of Double Bead Tape Sealant to the top leg of the Rake Cleat.
4. Install Rakewall to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c
5. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do **NOT** fasten Rakewall to wall.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

Vertical Lock panels must be installed prior to Rake installation.
1. Field cut and bend off module panel up 1 ¾".
2. Apply a row of Double Bead Tape Sealant to the vertical leg of the Vertical Lock panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14x1 ½" Self Driller XL, 1'-0" o.c.
4. Apply a row of Double Bead Tape Sealant to the top leg of the Rake Cleat.
5. Install Rakewall to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c. Do NOT fasten Rakewall to parapet wall.
6. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to parapet wall with Tube Sealant. Do NOT fasten Rakewall to wall.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
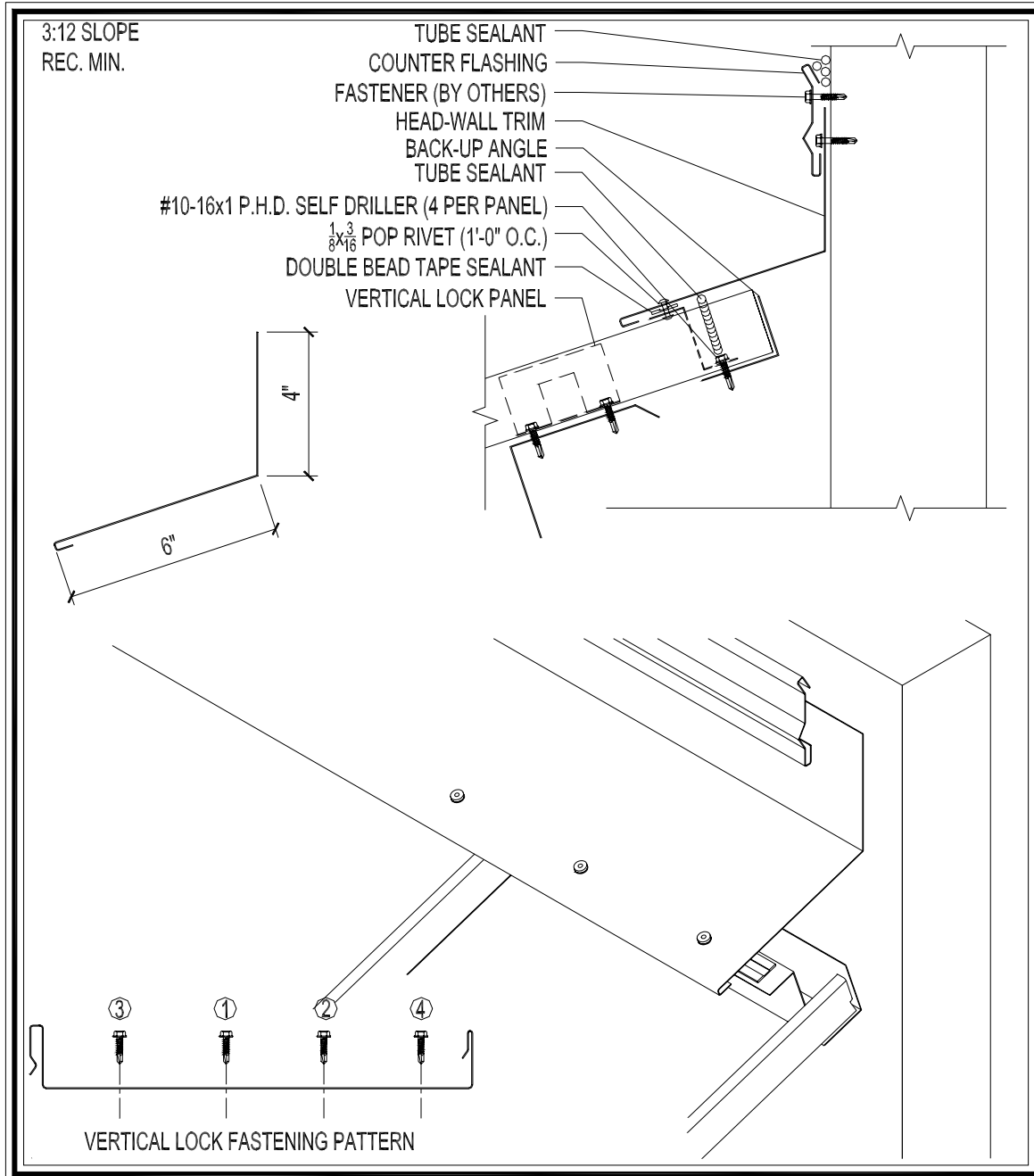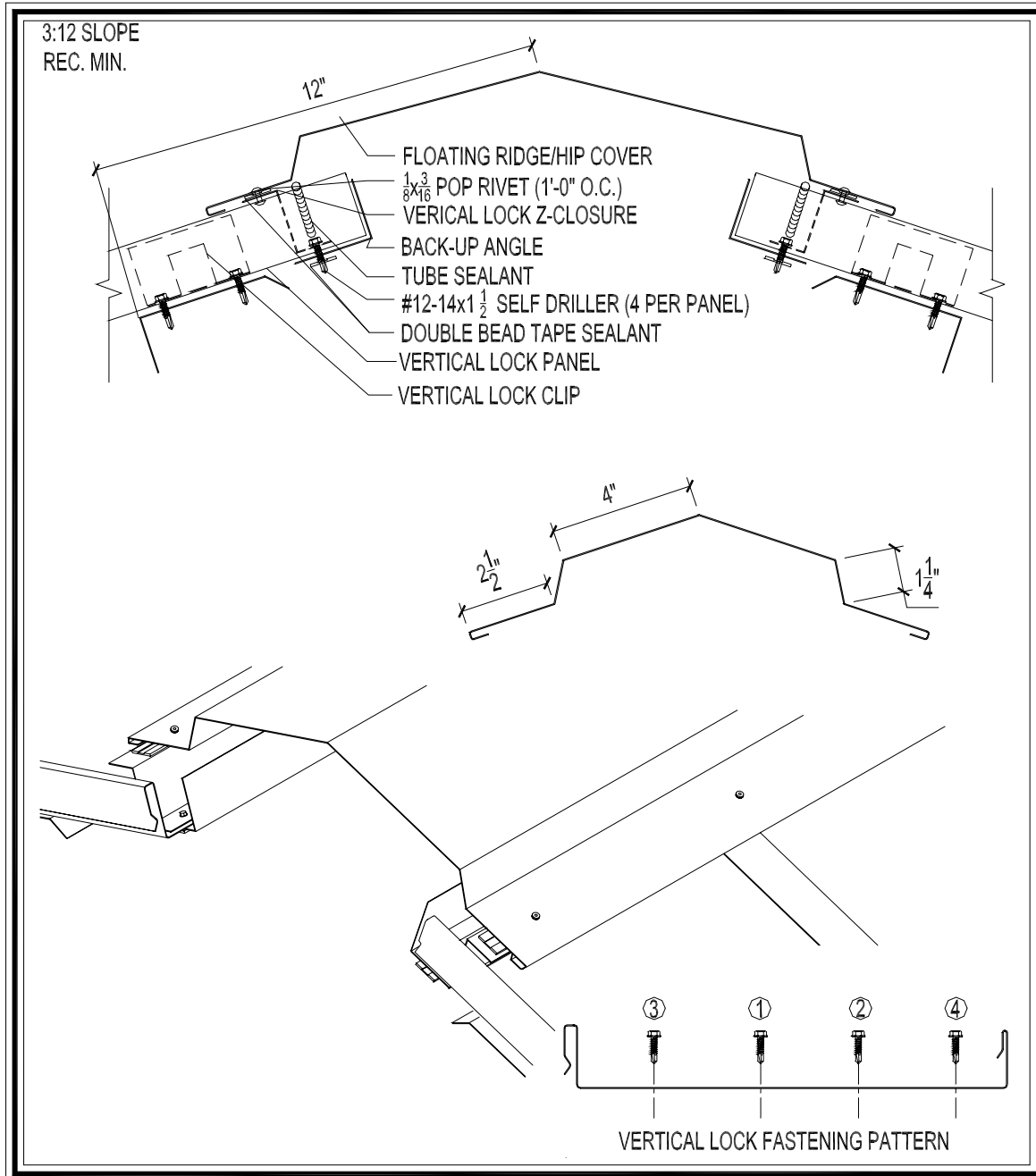
1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Position Back-Up Channel to allow for proper installation of Ridge/Hip assembly. Use C-clamps to hold Back-Up Channel in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approx 2" from panel end.
3. Install Vertical Lock Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure placement will accommodate Pitch Break Flashing.
4. Once Z-Closure is set in Double Bead Tape Sealant, fasten through Z-Closure and into Back-Up Channel with #10-16x1" Pancake Head Drillers (4 per panel).

Borga, Inc. 1/2008 Subject to change without notice

20

Office phone (559) 834-5375 - Office fax (559) 834-1406
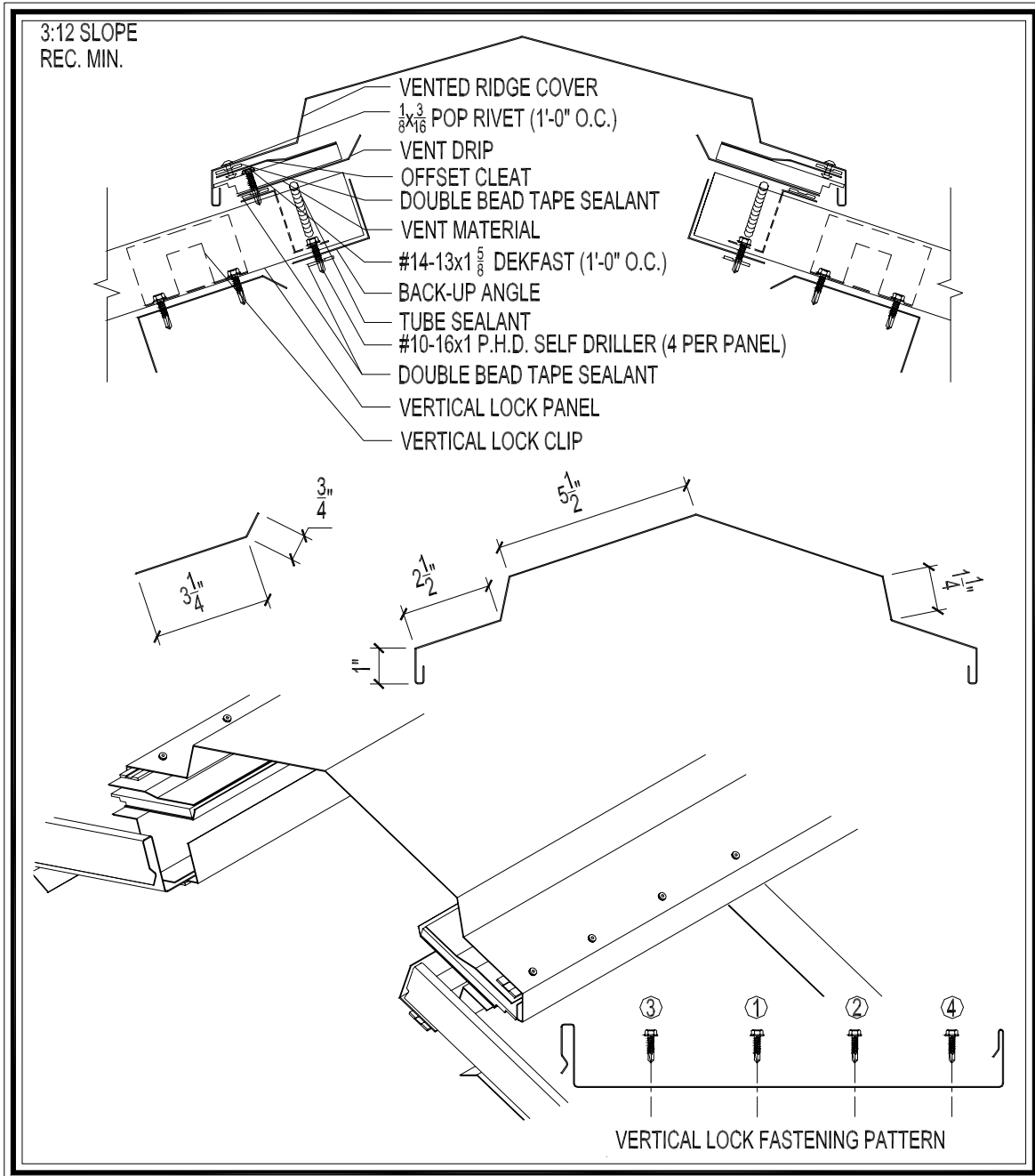300 West Peach St. - P.O. Box 35 - Fowler, CA 93625
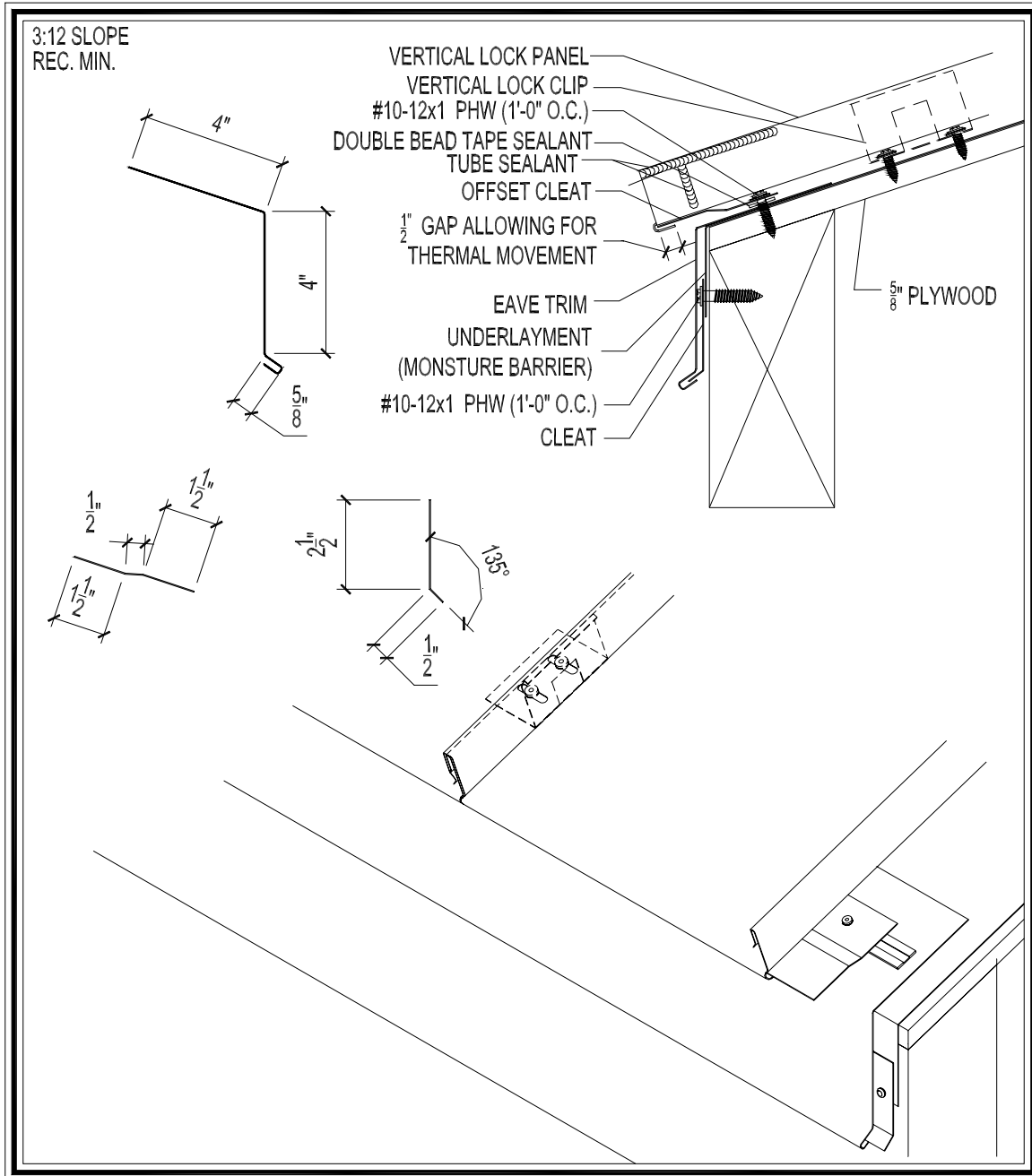www.borgasteel.com

1. Once panels have been installed, slide Back-Up Angle under upper edge of panels. Position Back-Up Angle to allow for proper installation of Ridge/Hip assembly. Use C-clamps to hold Back-Up Angle in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approx 2" from panel end on both sides of Ridge/Hip.
3. Install Vertical Lock Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure placement will accommodate SSR Ridge Cover.
4. Fasten through Z-Closure, Tape Sealant, Vertical Lock, and Back-Up Angle with (4) #10-16x1" PHD per panel once Z-Closure is set in Tape Sealant. C-clamps may be removed once closures have been fastened.
5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across the top of the Z-Closure on both sides of the Ridge/Hip. Tube sealant must be used to fill all gaps left around the Z-Closures.
6. Install Vent Drip, Vent Material, and Offset Cleat (in order) and fasten to top leg of Z-Closure with #14 Dekfasts at 1'-0" o.c.

7. Apply a row of Double Bead Tape Sealant across outer leg of Offset Cleat.
8. Install Vented Ridge Cover and secure to outer leg of Offset Cleat with Pop Rivets as shown.
9. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

3:12 SLOPE REC. MIN.

VENTED RIDGE COVER
$\frac{1}{8}$x$\frac{3}{16}$ POP RIVET (1'-0" O.C.)
VENT DRIP
OFFSET CLEAT
DOUBLE BEAD TAPE SEALANT
VENT MATERIAL
#14-13x1$\frac{5}{8}$ DEKFAST (1'-0" O.C.)
BACK-UP ANGLE
TUBE SEALANT
#10-16x1 P.H.D. SELF DRILLER (4 PER PANEL)
DOUBLE BEAD TAPE SEALANT
VERTICAL LOCK PANEL
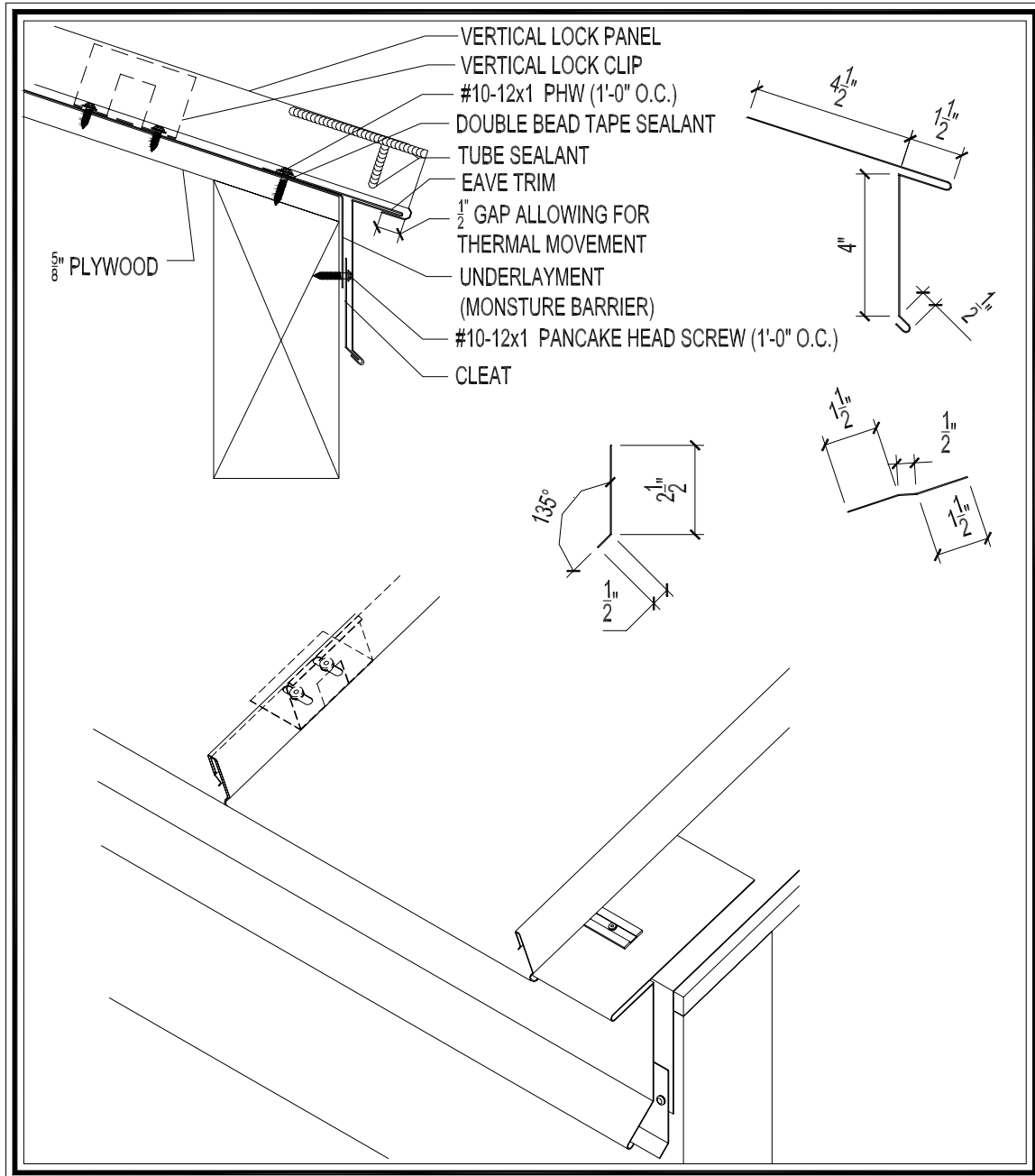VERTICAL LOCK CLIP

VERTICAL LOCK FASTENING PATTERN

1. Once panels have been installed, slide Back-Up Channel under upper edge of panels. Position Back-Up Channel to allow for proper installation of Ridge/Hip assembly. Use C-clamps to hold Channel in place.
2. Apply a row of Double Bead Tape Sealant across panel, up and over all ribs approx 2" from panel end on both sides of Ridge.
3. Install Vertical Lock Z-Closures over Double Bead Tape Sealant. Before continuing make sure Z-Closure placement will accommodate Vented Ridge Cover.
4. Fasten through Z-Closure, Tape Sealant, Vertical Lock, and Back-Up Angle with (4) #10-16x1" PHD per panel once Z-Closure is set in Tape Sealant. C-clamps may be removed once closures have been fastened.
5. Once all Z-Closures have been installed, place a row of Double Bead Tape Sealant across top of the Z-Closure on both sides of the ridge. Tube sealant must be used to fill all gaps left around the Z-Closures.

6. Install Vent Drip, Vent Material, and Offset Cleat (in order) and fasten to top leg of Z-Closure with #14 Dekfasts at 1'-0" o.c.
7. Apply a row of Double Bead Tape Sealant across outer leg of Offset Cleat.
8. Install Vented Ridge Cover and secure to outer leg of Offset Cleat with Pop Rivets as shown.
9. If two or more flashings are required, lap the flashing over the previously installed flashing by a min of 2" placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

All Eave flashings must be installed prior to panel installation.

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Eave attachment.
2. Install Eave flashing by sliding open hem onto Cleat and resting the Eave flashing against the substrate and fasten with #10-12 x 1" Pancake Head Woodscrew (1'-0" o.c.) to hold the Eave Flashing in place during installation.
3. Apply a row of Double Bead Tape Sealant on the bottom leg of the Offset Cleat and fasten to substrate with #10-12 x 1" Pancake Head Woodscrew through top of Eave flashing and into substrate, 1'-0" o.c. Make sure Offset Cleat is lined up to properly accommodate hemmed panel.
4. Install panel by engaging field hemmed end of panel to Offset Cleat for panel installation.
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
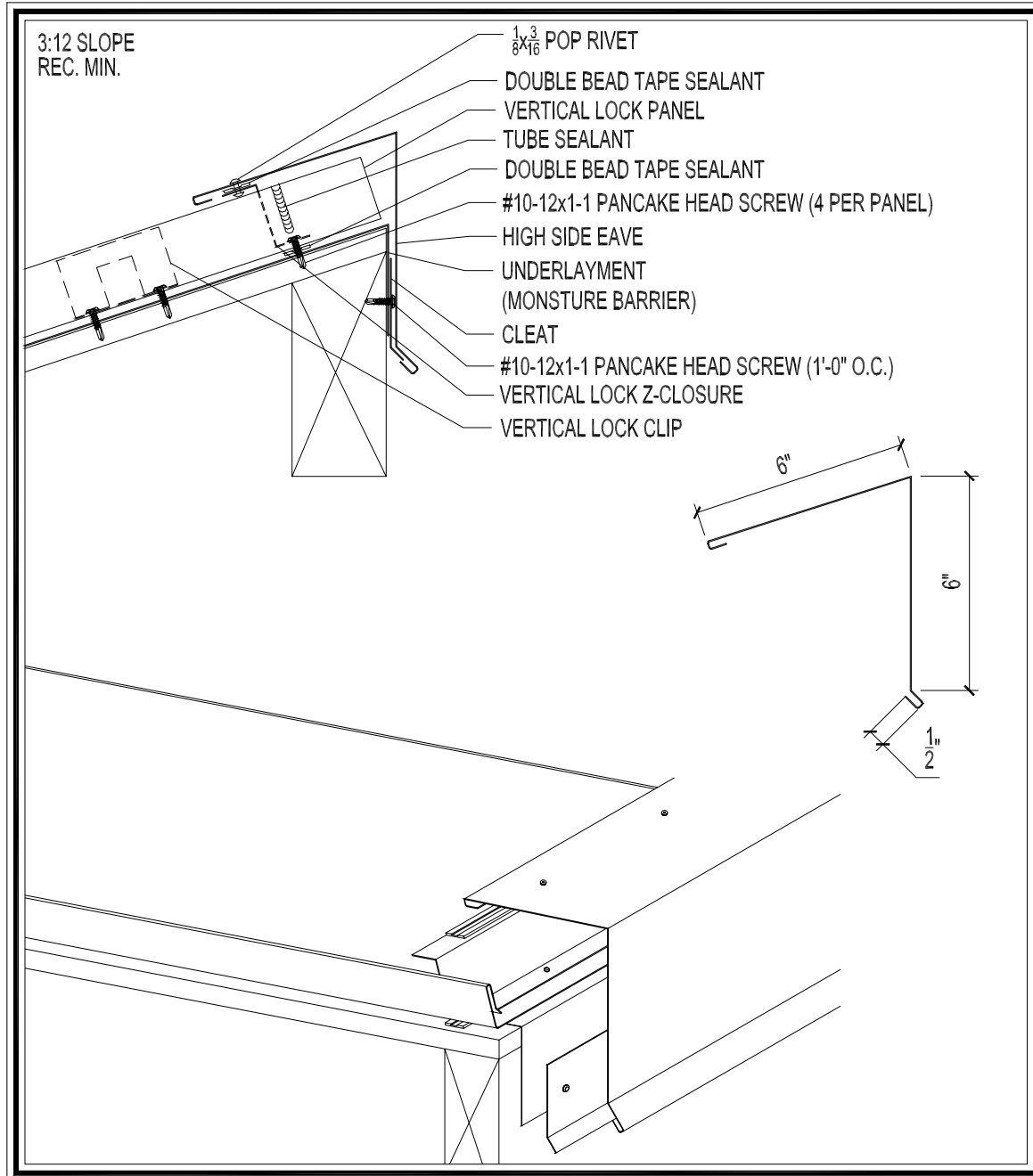
VERTICAL LOCK PANEL
VERTICAL LOCK CLIP
#10-12x1 PHW (1'-0" O.C.)
DOUBLE BEAD TAPE SEALANT
TUBE SEALANT
EAVE TRIM
½" GAP ALLOWING FOR THERMAL MOVEMENT
UNDERLAYMENT (MONSTURE BARRIER)
#10-12x1 PANCAKE HEAD SCREW (1'-0" O.C.)
CLEAT
⅝" PLYWOOD

1. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat allows for proper Extended Eave attachment.
2. Install Extended Eave flashing by sliding open hem onto Cleat and resting the Extended Eave flashing against the substrate. Fasten with #10-12 x 1" Pancake Head Woodscrew. 1'-0" o.c.
3. Apply a row of Double Bead Tape Sealant to extended leg of the Extended Eave flashing.
4. Install panel by engaging field hemmed end of panel to Extended Eave.
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

3:12 SLOPE
REC. MIN.

$\frac{1}{8}$x$\frac{3}{16}$ POP RIVET
DOUBLE BEAD TAPE SEALANT
VERTICAL LOCK PANEL
TUBE SEALANT
DOUBLE BEAD TAPE SEALANT
#10-12x1-1 PANCAKE HEAD SCREW (4 PER PANEL)
HIGH SIDE EAVE
UNDERLAYMENT
(MONSTURE BARRIER)
CLEAT
#10-12x1-1 PANCAKE HEAD SCREW (1'-0" O.C.)
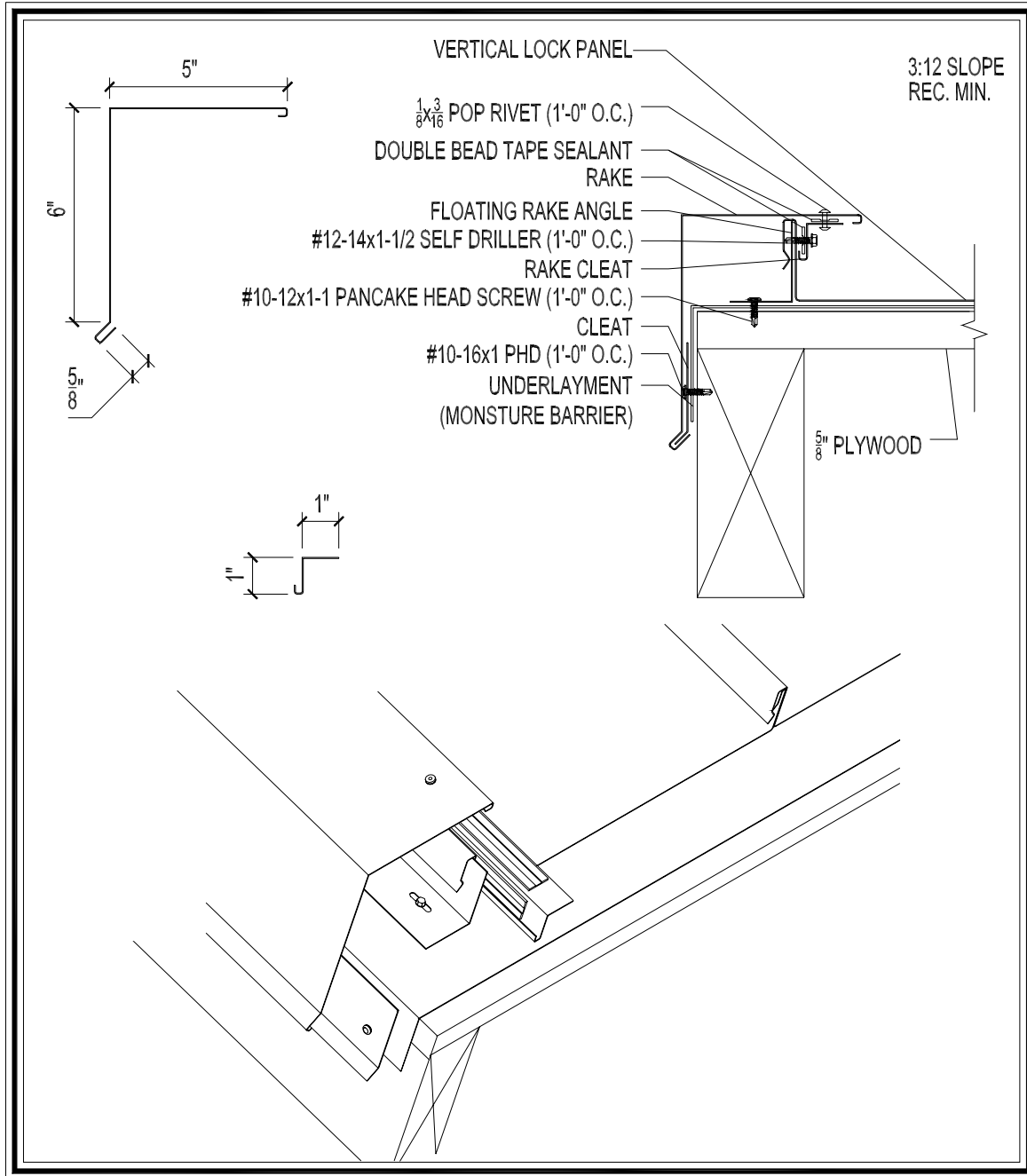VERTICAL LOCK Z-CLOSURE
VERTICAL LOCK CLIP

6"
6"
$\frac{1}{2}$"

1. Once panels have been installed, field cut the Vertical Lock Z-Closure to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure placement will accommodate Peak cover.
3. Install field cut Z-Closure.
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews. (4 per panel)
5. Apply a row of Tape Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install Cleat to the wall with the appropriate fastener, 1'-0" o.c. Make sure cleat allows for proper Peak attachment.
7. Install High Side Eave by sliding the open hem onto the Cleat and then attaching to the Z-Closure with 1/8" x 2/16" Pop Rivets, at the spacing shown above.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
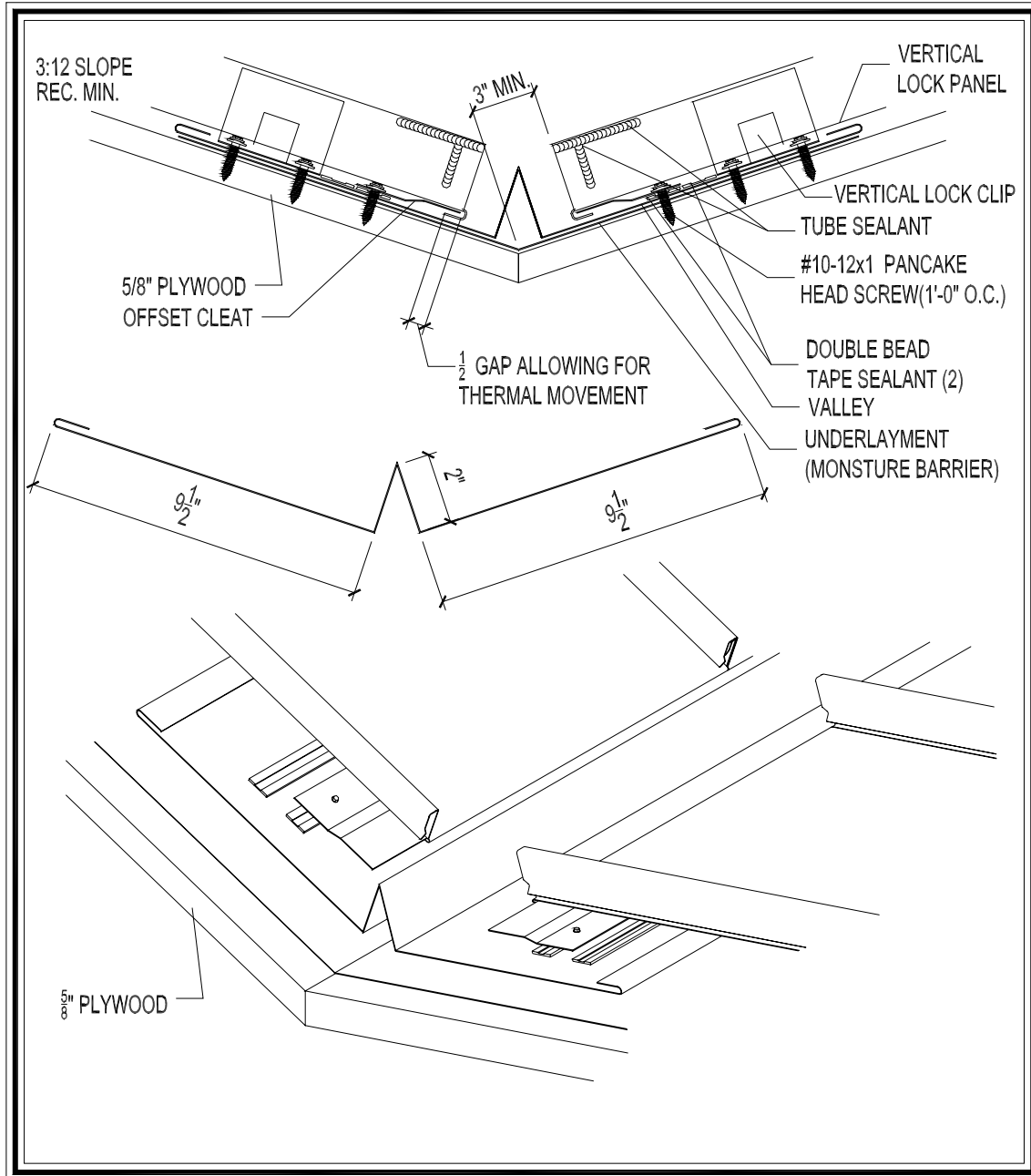
All Valley flashings must be installed prior to panel installation. If two or more valley flashings are required, valley must be installed working from eave to peak. It is recommended that ice and water shield be installed under valley flashing for added moisture protection.

1. Install Valley flashing against substrate. To hold Valley flashing in place, fasten to substrate with #10-12 x 1" Pancake Head fastener 1'-0" o.c.
2. Apply a row of Tape Sealant across both sides of Valley flashing approximately 5" from center of valley.
3. Properly align and install Offset Cleat on both sides of Valley flashing to accommodate panel hem and fasten to substrate with #10-12 x 1" Pancake Head fastener 1'-0" o.c.
4. Install panel by engaging field hemmed end of panel to Offset Cleat.
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with (2) pop rivets in the 1" water diverter.
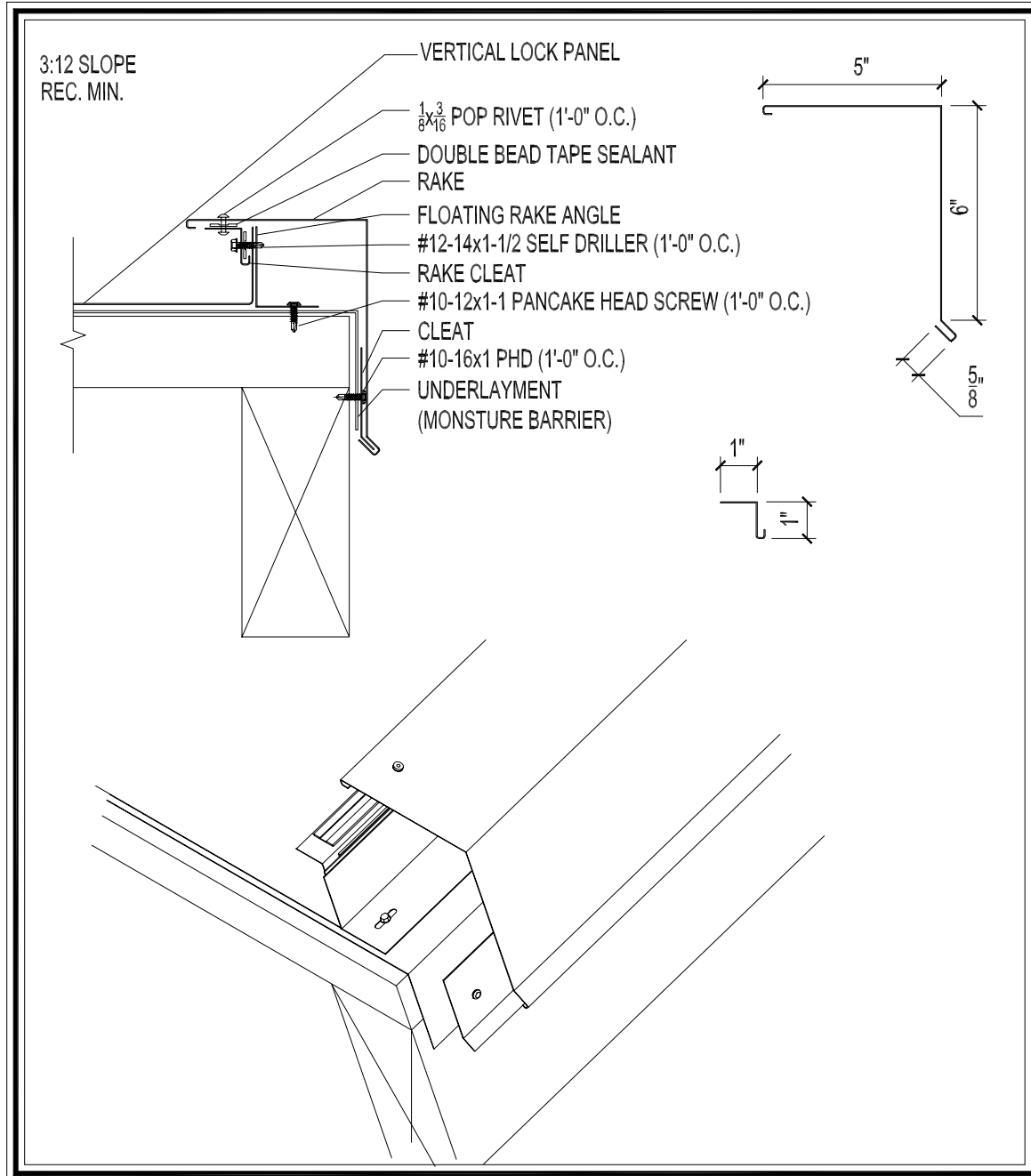
5"

6"

$\frac{5}{8}$"

VERTICAL LOCK PANEL

$\frac{1}{8}$x$\frac{3}{16}$ POP RIVET (1'-0" O.C.)
DOUBLE BEAD TAPE SEALANT
RAKE
FLOATING RAKE ANGLE
#12-14x1-1/2 SELF DRILLER (1'-0" O.C.)
RAKE CLEAT
#10-12x1-1 PANCAKE HEAD SCREW (1'-0" O.C.)
CLEAT
#10-16x1 PHD (1'-0" O.C.)
UNDERLAYMENT
(MONSTURE BARRIER)

3:12 SLOPE
REC. MIN.

$\frac{5}{8}$" PLYWOOD

1"

1"

Vertical Lock Floating Fake Angle and Vertical Lock panels must be installed prior to rake installation.
1. Apply a row of Double Bead Tape Sealant to vertical leg of Vertical Lock panel.
2. Position and install Rake Cleat through panel and into the Floating rake Angle with #12-14 x 1 ¼" Self-Driller, 1'-0" o.c.
3. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

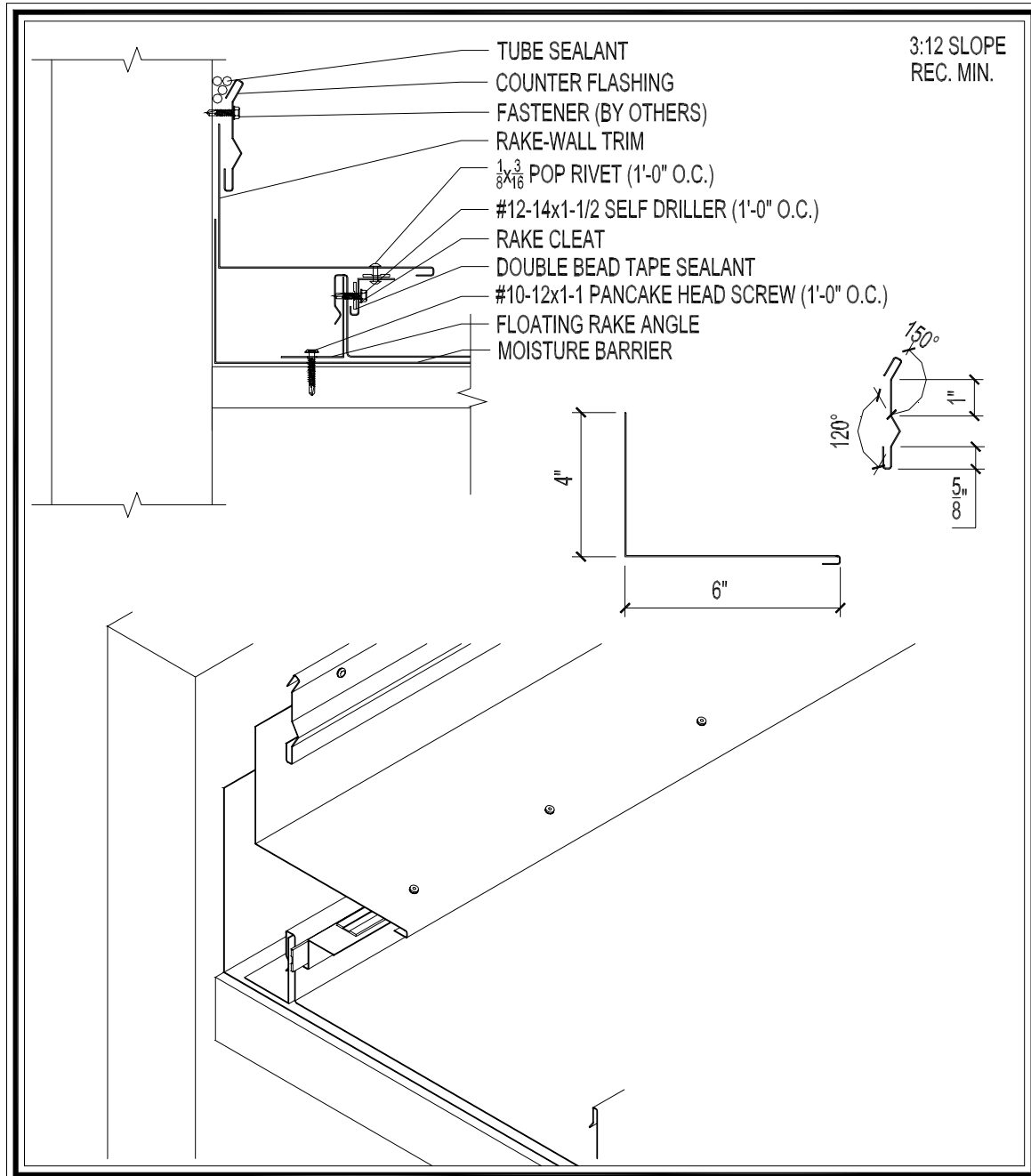**Vertical Lock Floating Rake Angle and Vertical Lock panels must be installed prior to rake installation.**

1. Field cut and bend off module panel up 1 ¾".
2. Apply a row of Double Bead Tape Sealant to vertical leg of Vertical Lock panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 ¼" Self-Driller, 1'-0" o.c.
4. Position and install Cleat to wall with appropriate fastener, 1'-0" o.c. Make sure Cleat installation allows for proper Rake attachment.
5. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
6. Install Rake by sliding the open hem onto the Cleat and then attaching to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

TUBE SEALANT
COUNTER FLASHING
FASTENER (BY OTHERS)
RAKE-WALL TRIM
$\frac{1}{8}$x$\frac{3}{16}$ POP RIVET (1'-0" O.C.)
#12-14x1-1/2 SELF DRILLER (1'-0" O.C.)
RAKE CLEAT
DOUBLE BEAD TAPE SEALANT
#10-12x1-1 PANCAKE HEAD SCREW (1'-0" O.C.)
FLOATING RAKE ANGLE
MOISTURE BARRIER

3:12 SLOPE
REC. MIN.

150°
120°
1"
$\frac{5}{8}$"

4"
6"

Vertical Lock Floating Rake Angle and Vertical Lock panels must be installed prior to rake wall installation.

1. Apply a row of Double Bead Tape Sealant to vertical leg of Vertical Lock panel.
2. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 ¼" Self-Driller, 1'-0" o.c.
3. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
4. Install Sidewall to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c.
5. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to wall with Tube Sealant. Do **NOT** fasten Sidewall to wall.
6. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
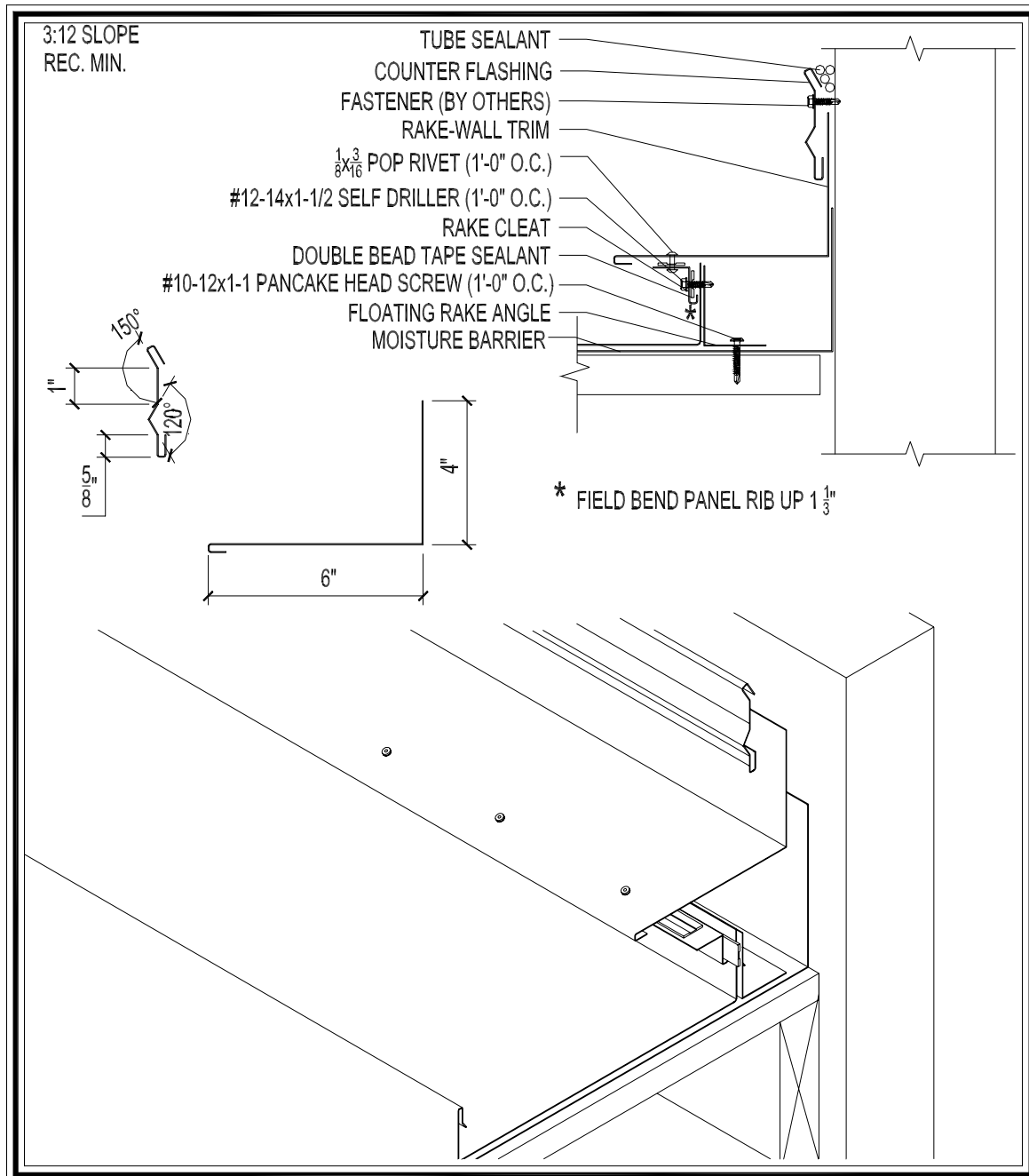
Vertical Lock panels must be installed prior to rake installation.
1. Field cut and bend off module panel up 1 ¾".
2. Apply a row of Double Bead Tape Sealant to vertical leg of Vertical Lock panel.
3. Position and install Rake Cleat through panel and into the Floating Rake Angle with #12-14 x 1 ¼" Self-Driller, 1'-0" o.c.
4. Apply a row of Double Bead Tape Sealant to top leg of Rake Cleat.
5. Install Sidewall to the Rake Cleat with 1/8" x 3/16" Pop Rivets at 1'-0" o.c. Do **NOT** fasten Sidewall to parapet wall.
6. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to wall with Tube Sealant. Do **NOT** fasten Sidewall to wall.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
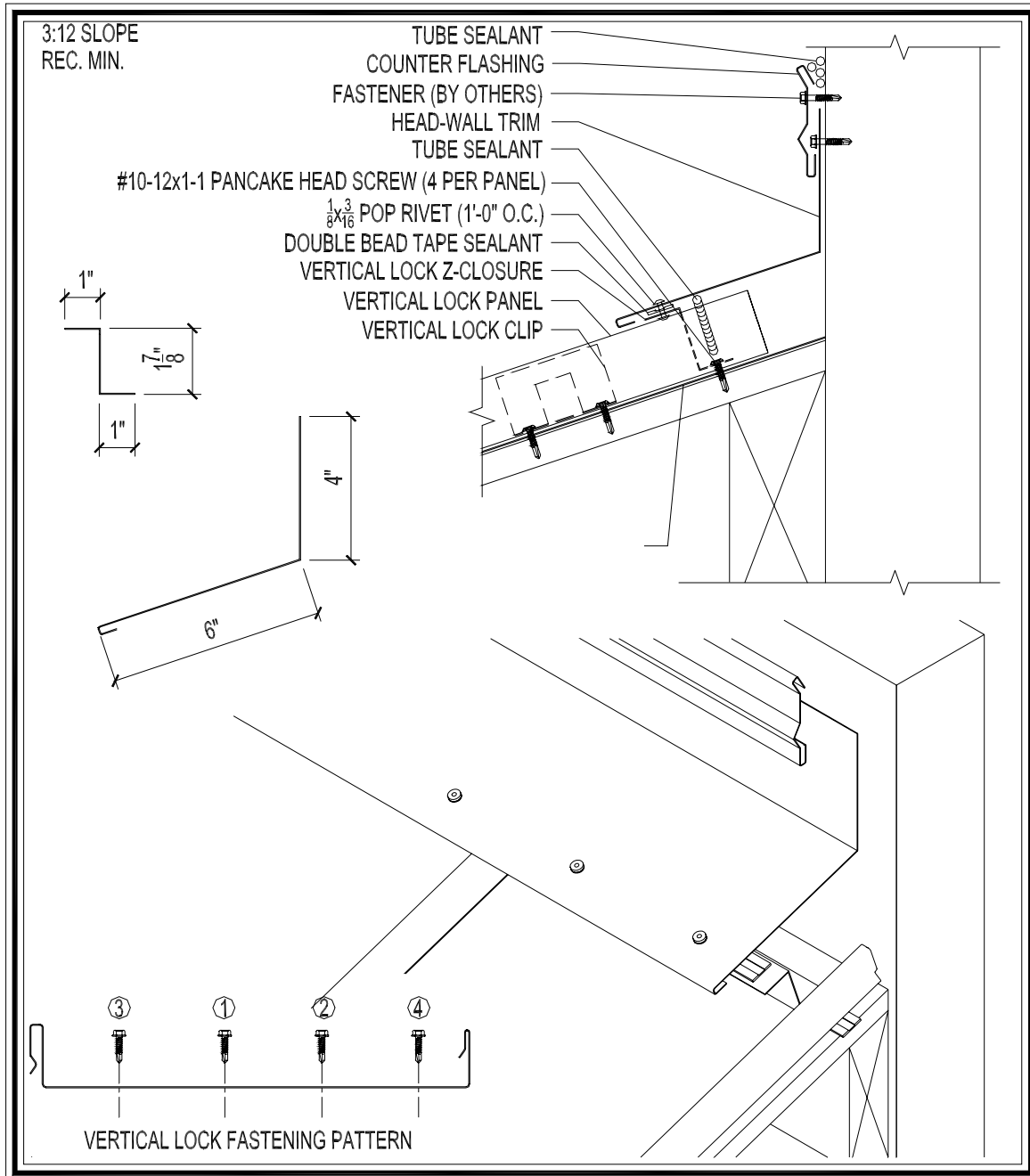
BUILD BETTER
BORGA
STEEL BUILDINGS & COMPONENTS

3:12 SLOPE
REC. MIN.

TUBE SEALANT
COUNTER FLASHING
FASTENER (BY OTHERS)
HEAD-WALL TRIM
TUBE SEALANT
#10-12x1-1 PANCAKE HEAD SCREW (4 PER PANEL)
$\frac{1}{8}$x$\frac{3}{16}$ POP RIVET (1'-0" O.C.)
DOUBLE BEAD TAPE SEALANT
VERTICAL LOCK Z-CLOSURE
VERTICAL LOCK PANEL
VERTICAL LOCK CLIP

1"
$1\frac{7}{8}$"
1"
4"
6"

③ ① ② ④

VERTICAL LOCK FASTENING PATTERN

1. Once panels have been installed, field cut the Vertical Lock Z-Closure to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure placement will accommodate Pitch Break flashing.
3. Install field cut Z-Closure.
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews. (4 per panel)
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs. Position and install Endwall flashing to Z-Closure with 1/8" x 2/16" Pop Rivets (as shown).
6. Fasten vertical leg of Endwall to the parapet wall with the appropriate fastener (1'-0' o.c.)
7. Install Counter Flashing, Reglet, or wall panel and fasten to parapet wall with appropriate fastener 1'-0" o.c. If Counter Flashing or Reglet is used, seal to wall with Tube Sealant. Do **NOT** fasten Endwall to wall.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
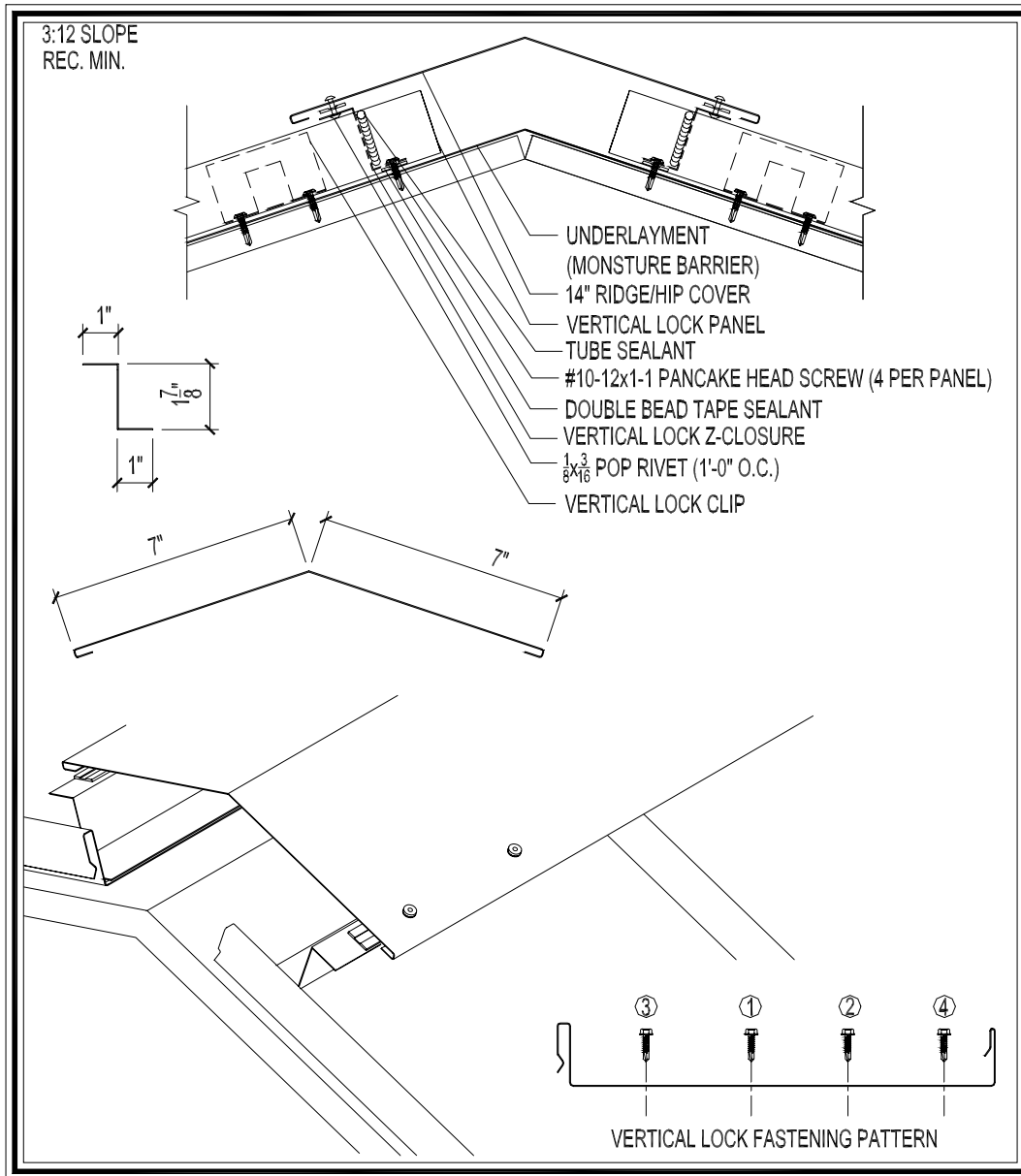
3:12 SLOPE
REC. MIN.

1"

$1\frac{7}{8}$"

1"

7"

7"

UNDERLAYMENT
(MONSTURE BARRIER)
14" RIDGE/HIP COVER
VERTICAL LOCK PANEL
TUBE SEALANT
#10-12x1-1 PANCAKE HEAD SCREW (4 PER PANEL)
DOUBLE BEAD TAPE SEALANT
VERTICAL LOCK Z-CLOSURE
$\frac{1}{8}$X$\frac{3}{16}$ POP RIVET (1'-0" O.C.)
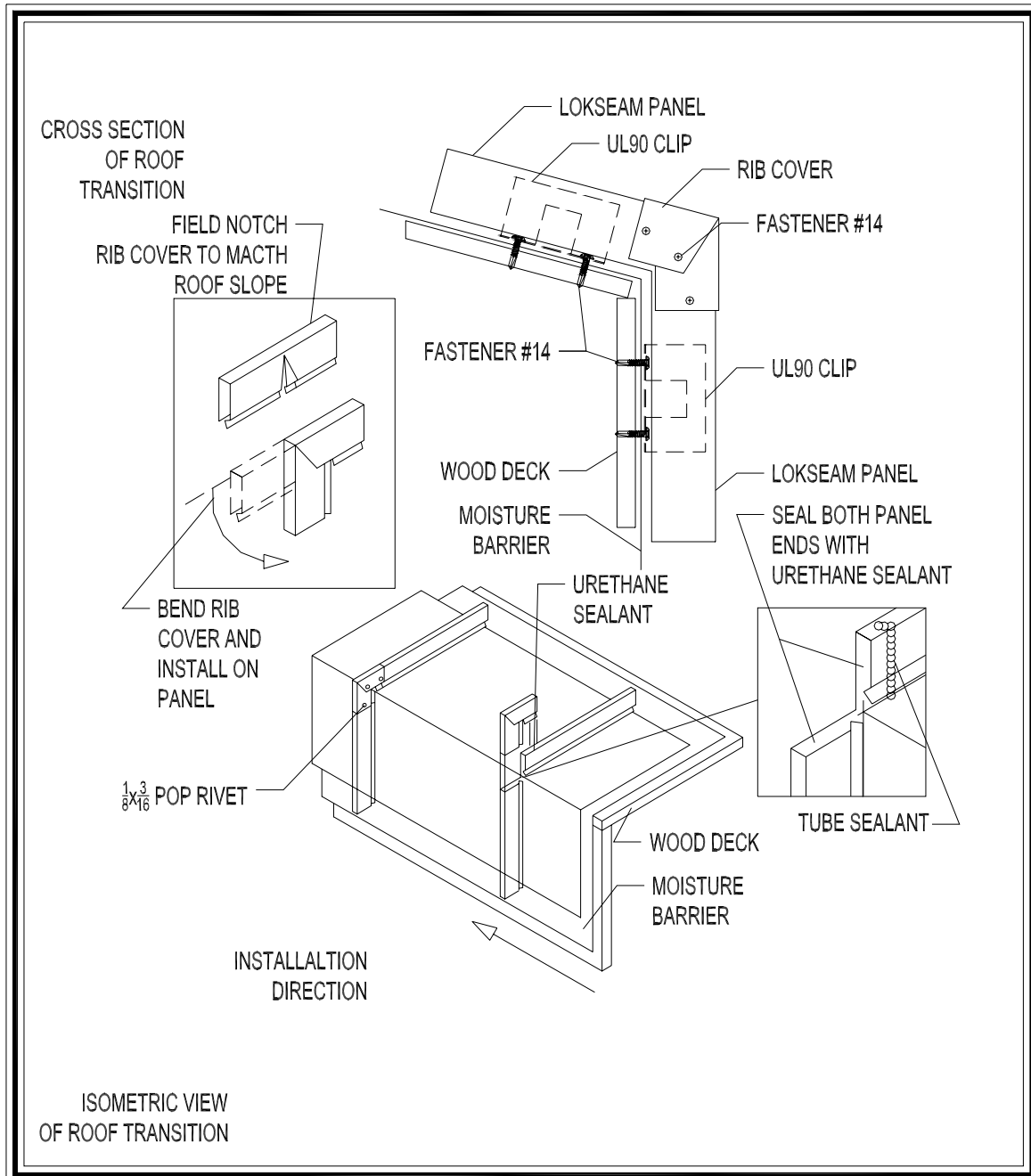VERTICAL LOCK CLIP

③ ① ② ④

VERTICAL LOCK FASTENING PATTERN

1. Once panels have been installed, field cut the Vertical Lock Z-Closure to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure placement will accommodate 14" Ridge/Hip cover.
3. Install field cut Z-Closure.
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews. (4 per panel)
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Position and install 14" Ridge/Hip Cover flashing to Z-Closure 1/8" x 3/16" Pop Rivets.
7. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
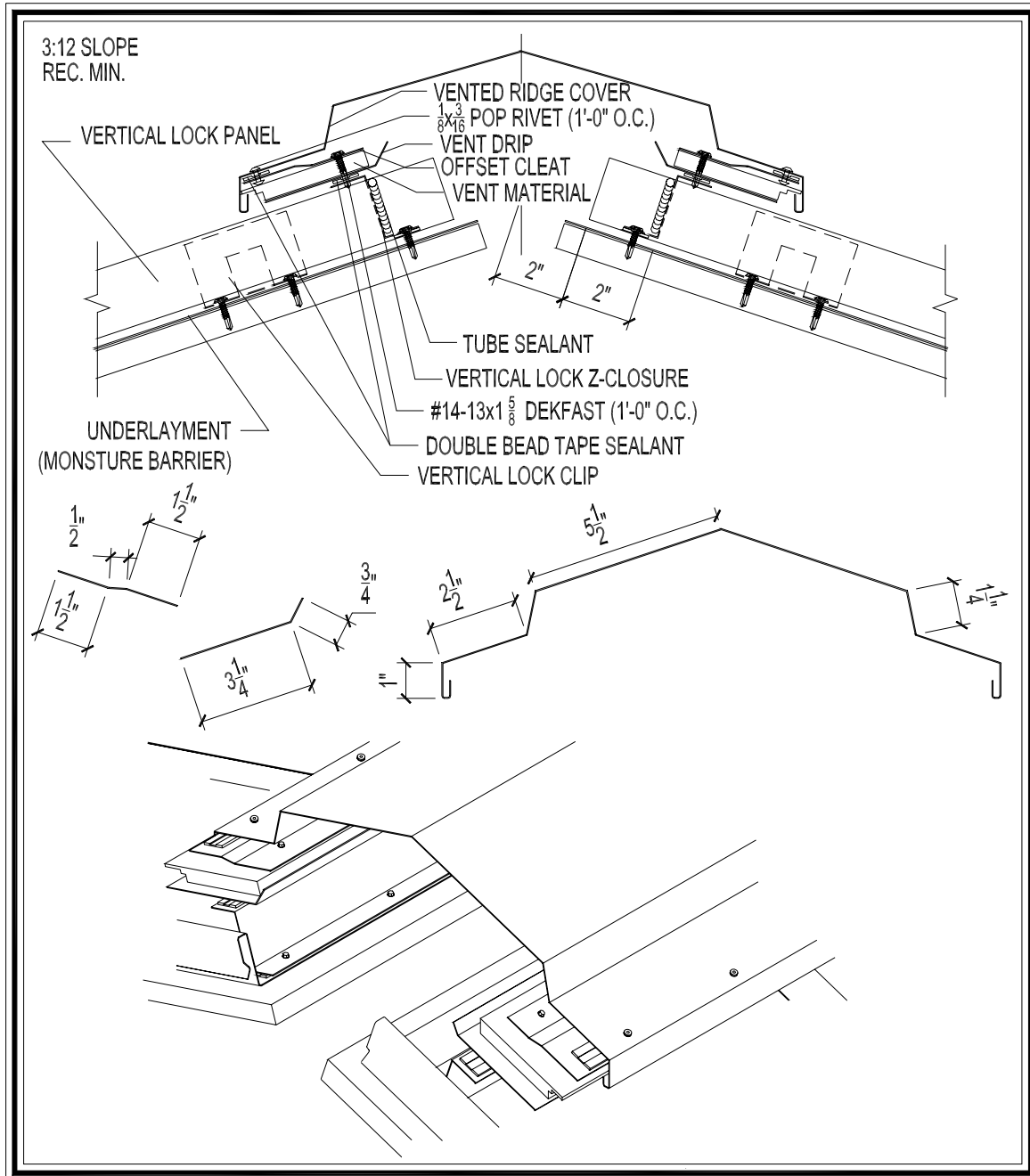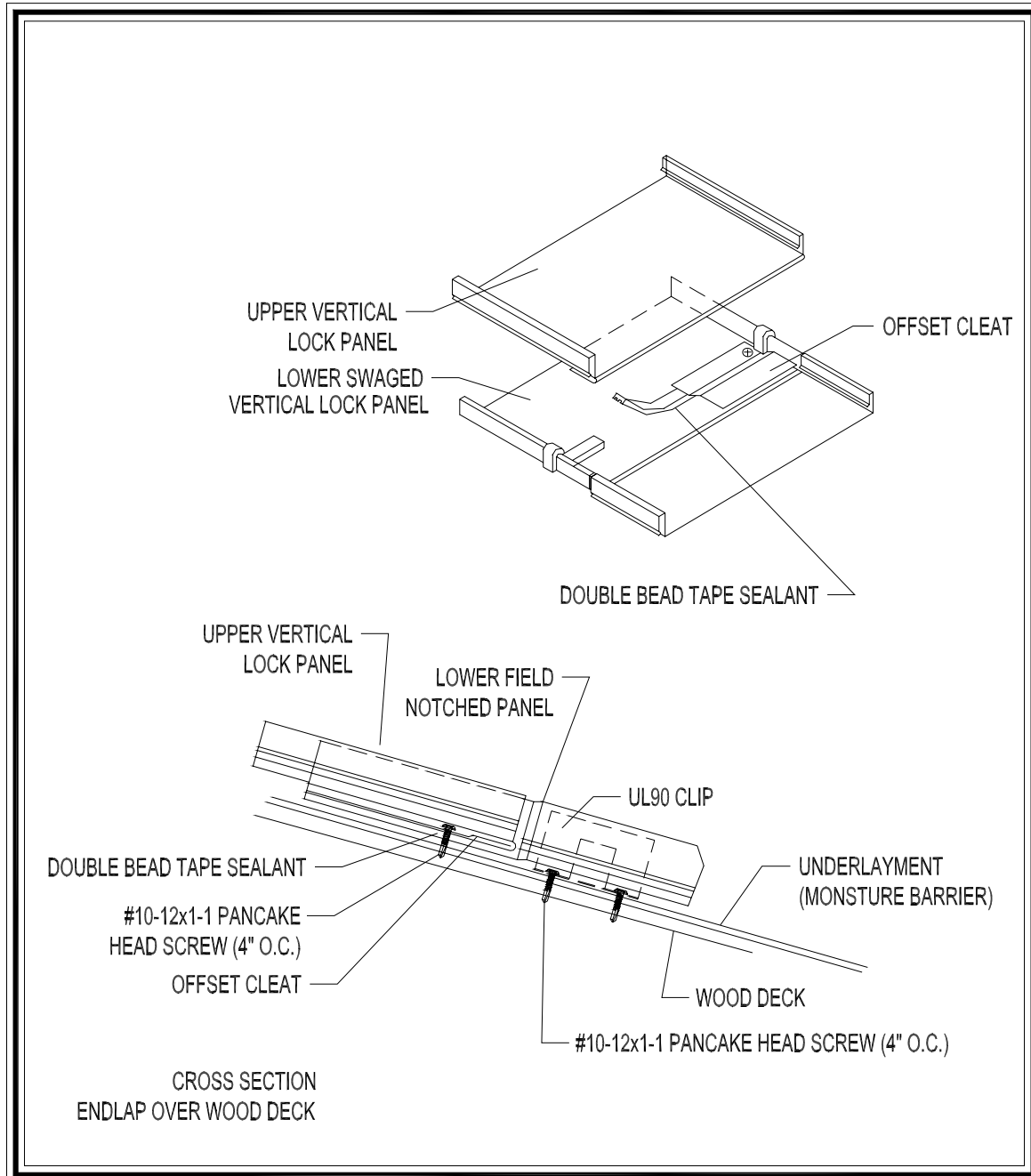
1. Once panels have been installed, field cut the Vertical Lock Z-Closure to fit between the panel ribs.
2. Place a row of Double Bead Tape Sealant across panel and over each panel rib approximately 2" from panel end. Before proceeding make sure Z-Closure placement will accommodate Vented Ridge cover.
3. Install field cut Z-Closure.
4. Fasten Z-Closure through panel with #10-12 x 1" Pancake Head Woodscrews. (4 per panel)
5. Apply a continuous bead of Tube Sealant across top leg of Z-Closure filling any gaps or openings around panel ribs.
6. Install Vent Drip, Vent Material, and Offset Cleat, as show above with #14-13 x 1 5/8" Dekfast screws, 1'-0" o.c. and apply a row of Double Bead Tape Sealant to the top leg of Offset Cleat.
7. Install Vented Ridge Cover to Offset Cleat with 1/8" Pop Rivets at 1'-0" o.c.
8. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.

All Gutter Flashings must be installed prior to panel installation.

1. Install Box Gutter flashing back against substrate. To hold Box Gutter Flashing in place, fasten to substrate with #10-12 x 1" Pancake Head Woodscrew 1'-0" o.c.
2. Install Universal Gutter/Downspout Straps every 3'-0" of gutter length to substrate with 10-12 x 1" Pancake Head Woodscrew, and fasten to Box Gutter with (1) Pop Rivet per Strap.
3. Apply a row of Double Bead Tape Sealant to bottom leg of Offset Cleat, position on back leg of Box Gutter, and fasten to substrate with #10-12 x 1" Pancake Head Woodscrew 1'-0" o.c.
4. Install panel by engaging field hemmed end of panel to Offset Cleat.
5. If two or more flashings are required, lap the flashing over the previously installed flashing by a minimum of 3", placing a bead of Tube Sealant between the flashings and securing with pop rivets 2 ½" o.c.
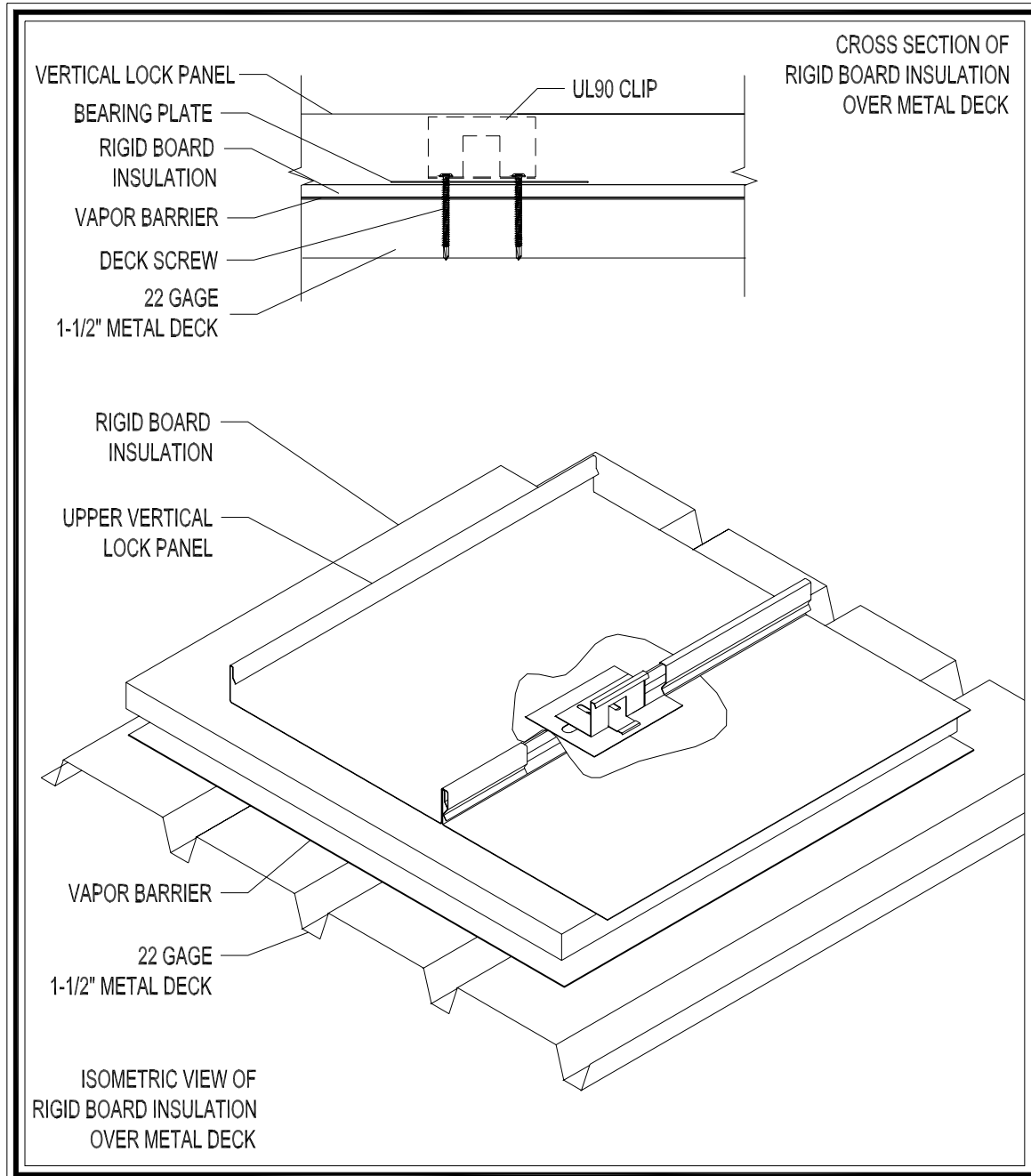6. Note: Size and gauge of Box Gutter must be designed to applicable governing building codes.

BORGA
STEEL BUILDINGS & COMPONENTS
BUILD BETTER

CROSS SECTION OF ROOF TRANSITION

FIELD NOTCH RIB COVER TO MACTH ROOF SLOPE

LOKSEAM PANEL

UL90 CLIP

RIB COVER

FASTENER #14

FASTENER #14

UL90 CLIP

WOOD DECK

LOKSEAM PANEL

MOISTURE BARRIER

SEAL BOTH PANEL ENDS WITH URETHANE SEALANT

BEND RIB COVER AND INSTALL ON PANEL

URETHANE SEALANT

$\frac{1}{8} \times \frac{3}{16}$ POP RIVET

TUBE SEALANT

WOOD DECK

MOISTURE BARRIER

INSTALLALTION DIRECTION

ISOMETRIC VIEW OF ROOF TRANSITION

1. Do not use this detail with the fixed ridge or hip details.
2. Field cut legs of panels and bend to required angle.
3. Fill both exposed ends of panel with urethane sealant.
4. Field notch rib cover to allow it to bend to the proper angle.
5. Field apply a bed of tube sealant over rib before applying rib cover.
6. A moisture barrier must be installed and extended a minimum of 12" up slope and behind the fascia to the bottom.
7. **Do not use this detail inside the building envelope.**

UPPER VERTICAL LOCK PANEL

LOWER SWAGED VERTICAL LOCK PANEL

OFFSET CLEAT

DOUBLE BEAD TAPE SEALANT

UPPER VERTICAL LOCK PANEL

LOWER FIELD NOTCHED PANEL

UL90 CLIP

DOUBLE BEAD TAPE SEALANT

#10-12x1-1 PANCAKE HEAD SCREW (4" O.C.)

OFFSET CLEAT

UNDERLAYMENT (MONSTURE BARRIER)

WOOD DECK

#10-12x1-1 PANCAKE HEAD SCREW (4" O.C.)

CROSS SECTION ENDLAP OVER WOOD DECK

1. **The above endlap detail must be used with the offset cleat method of attachment at the eave or valley. The fixed detail must be used at the ridge or hip. The above detail also requires that the Vertical Lock panels be swaged as normal. Order the upper endlap panel 1 ½" longer than normal for the panel hem.**
2. Install bottom panel so that eave has proper overhang
3. At upslope end of bottom panel, place Tri-Bead tape sealer over entire width of panel. Center of tape sealer should be 4 ½" from end of panel.
4. Install offset cleat across width of panel (over tape sealer) with Fastener #13 at 4" o.c. **Fasteners must go through tape sealer.**
5. Field notch male and female legs of panel 1 ½" and bend panel to form an open hem.
6. Clip spacing should not exceed 4'-0" o.c. for 24 gauge panels or 5'-0" for 22 gauge panels.

CROSS SECTION OF RIGID BOARD INSULATION OVER METAL DECK

VERTICAL LOCK PANEL
BEARING PLATE
RIGID BOARD INSULATION
VAPOR BARRIER
DECK SCREW
22 GAGE 1-1/2" METAL DECK
UL90 CLIP

RIGID BOARD INSULATION
UPPER VERTICAL LOCK PANEL
VAPOR BARRIER
22 GAGE 1-1/2" METAL DECK

ISOMETRIC VIEW OF RIGID BOARD INSULATION OVER METAL DECK

1. Metal Deck to be 1 ½" deep, 22 gauge.
2. Rigid board insulation to be 1" – 4" thick.
3. Clips and bearing plates to be installed simultaneously with two Deck Screws into the metal deck. Length of fasteners to be determined by thickness of insulation plus depth of metal deck. Fasteners should extend ¾" below metal deck.
4. Some composite systems require additional acoustical consideration. Contact your architect and/or engineer for proper acoustical design.