



Sure-Lok
Standing Seam
Roof System

Erection
Manual

THIS MANUAL APPLIES TO "SURE-LOK" SYSTEM.
"SURE-LOK" REQUIRES PANEL SIDELAPS TO BE
MECHANICALLY SEAMED.

EFFECTIVE JANUARY 1, 2006 / JC & JEN

IMPORTANT NOTICE

READ THIS MANUAL COMPLETELY PRIOR TO BEGINNING THE INSTALLATION OF THE **SURE-LOK** DETAILS MUST BE FOLLOWED AS A MINIMUM TO INSURE APPROPRIATE WARRANTIES WILL BE ISSUED.

IF THERE IS A CONFLICT BETWEEN PROJECT ERECTION DRAWINGS PROVIDED OR APPROVED BY USA AND DETAILS IN THIS MANUAL, PROJECT ERECTION DRAWINGS WILL TAKE PRECEDENCE.

THERMAL SPACER DISCLAIMER

The thermal spacer chart on page SL1EM-2 is intended to be used as a general guideline only. Because of the various densities of insulation currently available, the manufacturer cannot guarantee that this chart will be accurate in all situations. Further, the manufacturer does not specifically require that the roofing contractor use thermal spacers with it's Sure-Lok roof system. However, please review the following information:

- Although the manufacturer does not require a thermal spacer, the architect or building owner may.
- In certain environments, the compression of the fiberglass insulation, without a thermal spacer, may create a thermal break which can cause condensation to form on the purlins/ joists.
- On uninsulated buildings, eliminating the thermal spacer: (1) may cause "roof rumble" and (2) you may encounter problems holding panel module.
- When a high clip is used without a thermal spacer: (1) may encounter problems holding panel module and (2) foot traffic on the panel ribs may result in bent clips.
- Using a low clip with too much insulation or too thick a thermal spacer: (1) may cause "purlin read" (2) may cause difficulty in properly installing the panel side laps, and (3) you may encounter problems holding panel module.
- Thermal calculations should be performed on each project to ensure that the thermal movement of the roof is not greater than the floating clip's capacity. Various densities of blanket insulation and or the appearance of a metal roof system. The installer is responsible for selecting the proper clip and thermal spacer for their conditions. THERMAL BLOCKS AND INSULATION ARE OPTIONAL.

Descriptions and specifications contained herein were in effect at the time this publication was approved for printing. In a continuing effort to refine and improve products, USA reserves the right to discontinue products at any time or change specifications and/or designs without incurring obligation. To insure you have the latest information available, please inquire. Application details are for illustration purposes only and may not be appropriate for all environmental conditions, building designs, or panel profiles. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices. Insulation is not shown in these details for clarity.

CONTROL OF SURE-LOK PANEL MODULE

Standing seam panel modules can vary. The panel clips attach to the locking legs of the panel. This connection point is 3 3/8" or 4 3/8" higher than the base connection. Due to the distance of the connection points, the panel module can change based on personnel working in panels, the thickness of the insulation, etc.

MEASUREMENT OF PANEL MODULE

- Employee standing in the panel, during the measurement of panel module will change the measurement reading.
- The frame line(s) can be used as a location to measure the panel.

CLIPS / THERMAL BLOCKS

- Low clips are used for up to 4' of insulation, thermal blocks are not required.
- High clips required the use of thermal blocks.
 - * Thermal block sizing (high clip)
 1. 4" of insulation requires use of 3/4" thermal blocks
 2. 6" of insulation - USA standard is to supply 3/8" thermal blocks but some erectors prefer 3/4" thermal blocks. The 3/4" thermal block is only supplied when requested on the contract.
- Employees working in the panel during installation of panel clip and backup plates will affect the panel module. If employees are to work in the panel during the installation of the panel, then it is suggested the employee work over a secondary member, not in between the secondary members.

EAVE (METAL INSIDE CLOSURE)

- The installation of the inside closure is based on field measurement between the inside closures, therefore, the eave module should be at the proper location.
- An overall measurement at various inside closures or at frame line(s) is recommended since individual measurements (deviations between the individual closures) can be cumulative.

BACK UP PLATES

- The backup plate can be used to help to increase or decrease the panel module. The outer legs of the backup plate can be bent inward (toward the center of the plate) to decrease the panel module or bent outward (away from the center of the plate) to increase panel module.

NOTE: The panel must form to the shape of the backup plate. The backup plates must remain connected together (tab in slot).

RIDGE

- Installing the outside closures along the ridge/high eave during panel installation will help to control the panel module at this location. The outside closure can act as a spacer. The outside closure will need to be one run behind the installation. The panel must fully form to the backup plate and the backup plate must remain attached to the previous back up plate.

OTHER

- Wood blocking can be used to help stretch the panel module at clip locations. The wood blocking will help to control the clips at the wider location.
- Wood blocking can be cut from any available wood at the site.
- The wood blocking will be located between the vertical locking legs of the panel.
- The wood blocking should be cut + 1/4" to + 3/8" longer than required for a 2'-0" module.
- The blocking will remain in panels or 4 - 5 runs. If additional width gain is required, move the first installed block to the current panel run. All intermediate runs will remain.
- Use this method until the desired position is obtained. At this point the use of blocking can be discontinued. The wood blocking can be used, as required, during later stages of installation.
- The panel clips must remain tight to the panels.

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Sure-Lok

ERECTION

INDEX

ROOFING SYSTEM

Index.....	SL1EM-1
Architect/Engineering Information	SL1EM-2

ENGINEERING

UL-90 Requirements	SL1EM-3
ICBO Approval.....	SL1EM-3
16" Properties/Load Tables.....	SL1EM-4

GENERAL INFORMATION

Product Checklist	SL1EM-5-9
Ordering Information	SL1EM-10
Preparatory Requirements	SL1EM-11
Unloading	SL1EM-12-13
Handling/Panel Storage	SL1EM-14

INSTALLATION

Recommended Installation Techniques.....	SL1EM-15-16
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DESIGN

Typical Details

Outside Closure.....	SL1EM-17
Endlap	SL1EM-18
Ridge	SL1EM-19
High Side Eave.....	SL1EM-20
Valley	SL1EM-21
Floating Hip	SL1EM-22
Fixed Ridge/Hip.....	SL1EM-23
Rake	SL1EM-24
Gutter	SL1EM-25
Eave Trim	SL1EM-26
Parapet Rake	SL1EM-27
Parapet High Side Eave	SL1EM-28
Field Hemming Panel End.....	SL1EM-29
Transition.....	SL1EM-30

SEAMING INFORMATION

Seaming Information	SL1EM-31-33
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ARCHITECT/ENGINEER INFORMATION

1. **Sure-Lok** is a mechanically seamed roof system. Sure-Lok panels are 16". Factory applied mastic inside of female leg of panel is standard.
2. **Sure-Lok** is a structural roofing panel. This panel can be installed directly over purlins or bar joists. It does not require a solid substructure for support. The **Sure-Lok** roof system has several different UL-90 construction numbers.
3. **Sure-Lok** system is recommended for roof slopes of ½:12 or greater.
4. Weathertight and aesthetically pleasing endlaps may be accomplished through the use of swaged and prepunched panels. USA provides a prepunched back-up plate at the endlap for weathertightness. Prepunching of the panels is available for the endlap condition on 16" width panels only. Swaged endlaps require the roof erection to proceed from right to left as viewed from the eave looking toward the ridge. Roofs with no endlaps and less than 6:12 may be erected from either direction. For panel lengths over 40', please inquire.
5. Panels can be installed on roofs with a transition by using USA's die-formed rib covers.
6. Heavier gauges, striations, embossing and installation over a solid deck minimize oil canning. Industry standard is a minimum 24 gauge material. **Oil canning is not a cause for rejection.**
7. Substructure must be on an even plane from eave to ridge to avoid panel distortion (¼" in 20', ⅜" in 40' tolerance).(Max ¼" shims @ clips.)
8. All panels require end sealant at eave and valley conditions; however, for illustration purposes, this sealant is not shown on all drawings. See pageSL1EM-15 for panel end sealant detail.
9. For proper fastener application, see Product Checklist.
10. All perimeter trim dimensions in this manual are based on a wall panel thickness of 1¼" ('PBR' Panel). Any variation from this wall panel thickness may affect the perimeter trim dimensions.
11. The information in this manual is believed to be correct and accurate. It should not be used for any specific application without being reviewed by a registered professional engineer.
12. Drawings in this manual utilize the low fixed clip. Clips are available in low or high fixed, low or high floating and utility. Please use the reference chart below to determine the clip required for your particular job.
13. **Avoid restricting the thermal expansion and contraction of the Sure-Lok panels. (ie: Do not attach panel to the substructure at both the eave and ridge.) However, panels must be attached to the substructure at one end to prevent their sliding downslope.**
14. **Sure-Lok panels are not designed to be work platforms.** Avoid any unnecessary foot traffic on Sure-Lok panels. If foot traffic is required, protect the roof panels by using soft soled shoes and some type of roof pad, temporary deck, or walkway.
15. **WARNING: Light transmitting panels are not designed or intended to bear the weight of any person walking, stepping, standing or resting on them. USA DISCLAIMS ANY WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, that any person can safely walk, step, stand or rest on or near these light transmitting panels or that they comply with any OSHA regulation.**
16. A vapor retarder may be necessary to protect roofing components when high interior humidity is a factor. The need for a vapor retarder, as well as the type, placement and location should be determined by an architect or engineer. The following are examples of conditions that may require a vapor retarder: (A) Projects where outside winter temperatures below 40°F are anticipated and where average winter interior relative humidity of 45% or greater is expected. (B) Building usages with high humidity interiors, such as indoor swimming pools, textile manufacturing operations, food, paper or other wet-process industrial plants. (C) Construction elements that may release moisture after the roof is installed, such as interior concrete and masonry, plaster finishes and fuel burning heaters.
17. Typically, when wood decks are used, they are temporarily protected by the installation of a moisture barrier over the wood deck. If utility clips are to be used, the **Sure-Lok** panel will lay tight to the wood deck. If tin tabs are used to attach the moisture barrier to the deck, they must be covered with duct tape or some other material to prevent them from rusting the back side of the panels. Also, plastic washers may "telegraph" through the panels.

It will greatly facilitate DESIGNING, QUOTING, ORDERING, OR ERECTING the USA **Sure-Lok** roof if you determine which system you need or have, based on building width and insulation requirements.

FIXED

BUILDING WIDTH
 DOUBLE SLOPE 200' WIDE OR LESS
 SINGLE SLOPE 100' WIDE OR LESS
LOW FIXED- With or without ⅝" thermal spacer
HIGH FIXED- With ⅜", ¾" or 1" thermal spacer for added insulation.
UTILITY- For applications that do not require the clearance provided by the low and high clips.

FLOATING

BUILDING WIDTH
 DOUBLE SLOPE OVER 200' WIDE
 SINGLE SLOPE OVER 100' WIDE
LOW FLOATING- With or without ⅝" thermal spacer
HIGH FLOATING- With ⅜", ¾" or 1" thermal spacer for added insulation.

Floating clips have maximum of 1" movement in each direction.

FOR ROOF PITCHES GREATER THAN 6:12, CALL USA.

NOTES

1. The above applies to pre-engineered metal buildings.
2. Thermal calculations should be performed for each project to ensure that the thermal movement of the roof will not exceed the design of the clip.
3. Bar joist construction (all widths) requires a floating system.
4. As with all standing seam roof systems, a sound insulator (EXAMPLE: blanket insulation) is required between the panel and substructure. Some composite systems require additional acoustical consideration. Call USA for further information.
5. Utility clips require the use of a low profile fastener, ie: pancake head.

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Sure-Lok

ERECTION

UNDERWRITERS LABORATORIES APPROVAL

Sure-Lok Panel

Construction Number	Panel Width (In.)	Gauge	Clip Type	Clip Spacing	Substrate	UL-2218 Impact Resistance	UL-263 Fire Rating	UL-580 Rating
90	16"	24 min.	*	5'-0 ¹ / ₁₆ "	Open Framing	Class 4	Class A	Class 90
176	16"	24 min.	N/A	5'-0 ¹ / ₄ "	Open Framing	Class 4	Class A	Class 90
180	16"	24 min.	**	5'-0 ¹ / ₁₆ "	Open Framing	Class 4	Class A	Class 90
238B	16"	24 min.	**	2'-6"	Composite System	Class 4	Class A	Class 90
437	16"	24 min.	**	5'-0"	Plywood	Class 4	Class A	Class 90
449	16"	24 min.	*	5'-0"	Open Framing	Class 4	Class A	Class 90
451	16"	24 min.	*	2'-0"	Composite System	Class 4	Class A	Class 90
452	16"	24 min.	*	2'-0"	Composite System	Class 4	Class A	Class 90
487	16"	24 min.	**	4'-0"	Composite System	Class 4	Class A	Class 90

* Fixed or Floating (high or low)

** Fixed or Floating (high, low, or utility)

NOTES

1. Tests procedures are in accordance with Underwriters Laboratories Standard UL-580 under "Tests For Uplift Resistance of Roof Assemblies".
2. A detailed installation method is available for each Construction Number above and can be found in the UL Roofing Materials and Systems Directory. The panels must be installed in a certain manner to achieve the published results.
3. The panel qualifies for a Class A fire rating in compliance with Underwriters Laboratories Standard UL-263.
4. The panel system qualifies under the following Fire Resistance Design Numbers: P224, P225, P227, P230, P233, P237, P265, P268, P508, P512, P701, P711, P801, P803.

Refer to the UL Fire Resistance Directory for specific construction methods and hourly ratings.

ICBO APPROVAL

Sure-Lok roofing system details, engineering calculations, computer printouts and data have been examined by the ICBO Evaluation Service, Inc.. and have been found to comply with the 1997 Uniform Building Code.

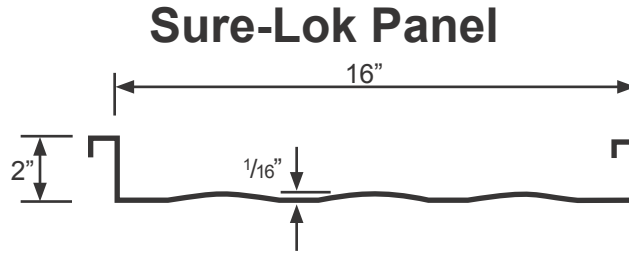


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ERECTION

Sure-Lok



SECTION PROPERTIES									
PANEL WIDTH	PANEL GAUGE	F _y (KSI)	WEIGHT (PSF)	TOP FLAT IN COMPRESSION			BOTTOM FLAT IN COMPRESSION		
				I _x (in. ⁴ /ft.)	S _e (in. ³ /ft.)	M _a (Kip in.)	I _x (in. ⁴ /ft.)	S _e (in. ³ /ft.)	M _a (Kip in.)
16"	24	50.0	1.29	0.1005	0.0544	1.6300	0.0557	0.0489	1.4650
	22	50.0	1.65	0.1413	0.0791	2.3700	0.0788	0.0652	1.9520

NOTES

- All calculations for the properties of **Sure-Lok** panels are calculated in accordance with the 1986 edition of *Specifications for the Design of Light Gauge Cold Formed Steel Structural Members* - published by the American Iron and Steel Institute (A.I.S.I.).
- I_x is for deflection determination.
- S_e is for bending.
- M_a is allowable bending moment.
- All values are for one foot of panel width.

ALLOWABLE UNIFORM LOADS IN POUNDS PER SQUARE FOOT

24 Gauge (F _y =50KSI)		16" Wide Panel							
SPAN TYPE	LOAD TYPE	SPAN IN FEET							
		2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
2-SPAN	POSITIVE WIND LOAD	208	144	106	81	64	52	43	36
	LIVE LOAD/DEFLECTION	156	109	80	61	48	39	32	27
3-SPAN	POSITIVE WIND LOAD	260	180	133	101	80	65	54	45
	LIVE LOAD/DEFLECTION	195	136	100	76	60	49	40	34

22 Gauge (F _y =50KSI)		16" Wide Panel							
SPAN TYPE	LOAD TYPE	SPAN IN FEET							
		2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
2-SPAN	POSITIVE WIND LOAD	277	192	141	108	85	69	57	48
	LIVE LOAD/DEFLECTION	208	145	106	81	64	52	43	36
3-SPAN	POSITIVE WIND LOAD	346	240	177	135	107	87	72	60
	LIVE LOAD/DEFLECTION	260	181	133	102	80	65	54	45

NOTES

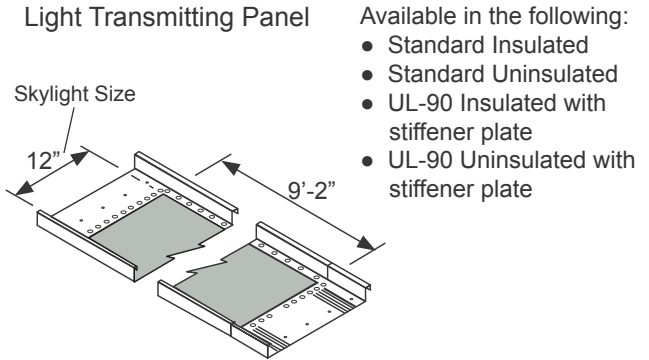
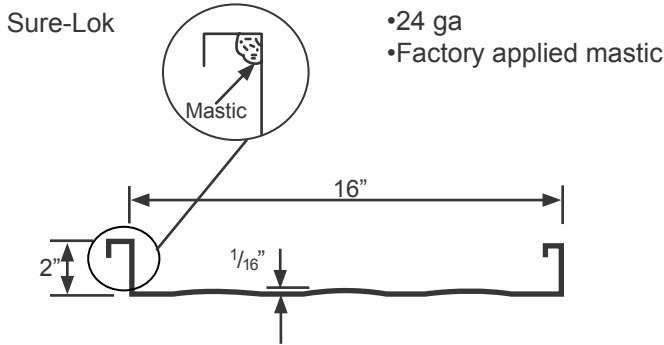
- Allowable loads are based on uniform span lengths and F_y of 50 KSI.
- Live load is allowable live load.
- Wind load is allowable wind load and has been increased by 33⅓%.
- Deflection loads are limited by a maximum deflection ratio of L/240 of span or maximum bending stress from live load.
- Weight of the panel has not been deducted from allowable loads.
- Load table values do not include web crippling requirements.
- Negative uplift values are available from USA.



Sure-Lok

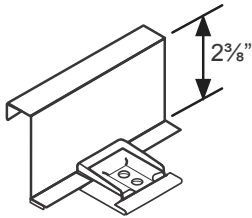
ERECTION

PRODUCT CHECKLIST

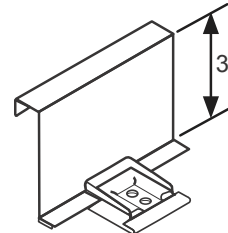


Clip, Low Floating For use with or without $\frac{3}{8}$ " thermal spacer

Clip, High Floating For use with or without $\frac{3}{8}$ ", $\frac{1}{4}$ " or 1" thermal spacer



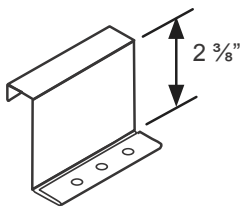
M0413 2 SCREWS PER CLIP



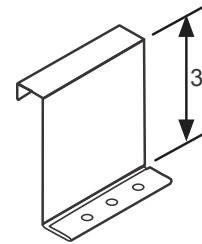
M0414 2 SCREWS PER CLIP

Clip, Low Fixed For use with or without $\frac{3}{8}$ " thermal spacer

Clip, High Fixed For use with or without $\frac{3}{8}$ ", $\frac{1}{4}$ " or 1" thermal spacer



M0531 2 SCREWS PER CLIP

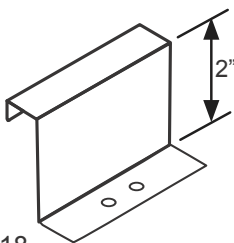


M0536 2 SCREWS PER CLIP

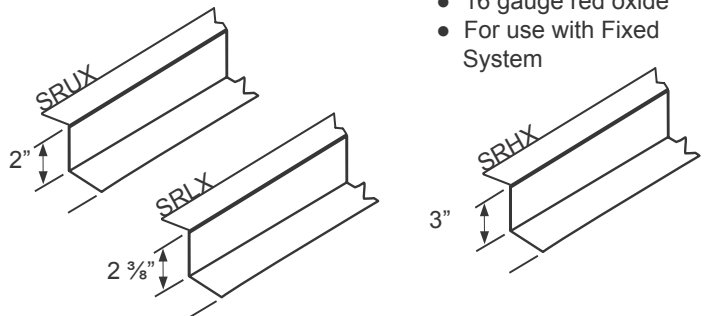
Clip, Utility For applications that do not require the clearance provided by the low and high clips.

Rake Support Zee

- 20'-0" length
- 16 gauge red oxide
- For use with Fixed System



HW-218 2 SCREWS PER CLIP





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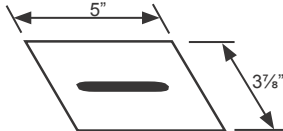
ERECTION

Sure-Lok

PRODUCT CHECKLIST

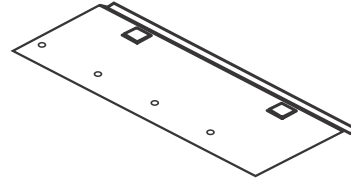
Bearing Plate, Standard

- 16 gauge red oxide
- For use with low or utility systems



Back-Up Plate

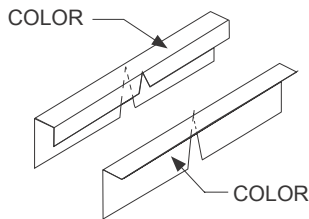
- For use at ridge and endlaps
- Prepunched
- 16 gauge red oxide
- 16" wide



HW-7766

Two Piece Rib Cover

OUTER COVER
 FL249A

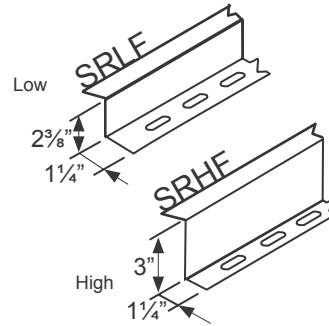


INNER COVER
 FL249B

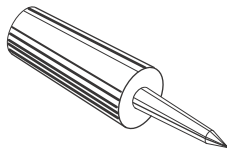
24 Gauge Material

Rake Support Zee

- 20'-0" length
- 16 gauge red oxide
- Factory Slots
- For use with floating system

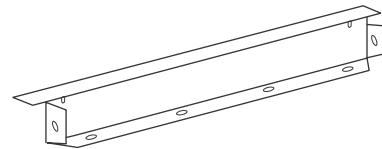


Tube Sealant
 10.1 oz, clear



36 lineal feet of 3/8" bead per tube of sealant

Outside Closure
 (Standard)
 16" wide



HW-440

Tape Sealer



Tri-Bead Tape Sealer

- 3/16" x 7/8" x 25'
- For use at eave, ridge, endlaps and trim connections



Triple Bead Tape Sealer

- 3/16" x 2 1/2" x 20'
- For use at valley when using exposed fasteners
- For use with roof curbs
- For use at high rib of panel end lap (swaged panel) 6" long

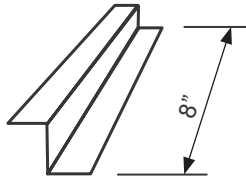


Sure-Lok

ERECTION

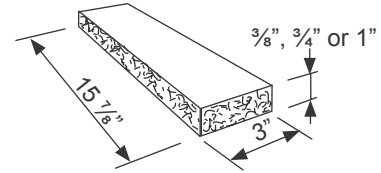
PRODUCT CHECKLIST

Gutter Strap

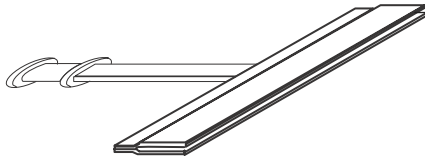


Thermal Spacer

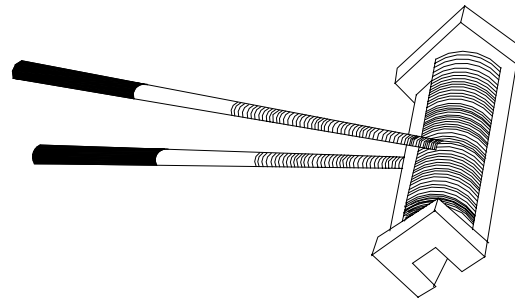
- Polystyrene block used to increase the insulation capacity along the purlins



Panel Hemming Tool



Phase 1 Hand Crimper





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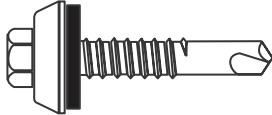
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Sure-Lok

PRODUCT CHECKLIST

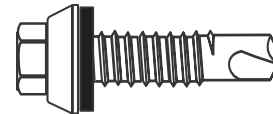
12-14x1" Self Driller
 $\frac{5}{16}$ " Hex Washer Head, with washer

- Clip to purlin



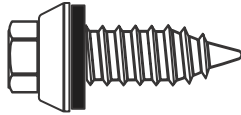
12-14x1 $\frac{1}{4}$ " Driller
 $\frac{5}{16}$ " Hex Washer Head, with sealing washer

- Panel to eave strut
- Rake trim to roof panel
- Standard Endlaps
- Panel to valley plate



17x1" AB
 $\frac{5}{16}$ " Hex Washer Head, with sealing washer

- Use in place of all stripouts



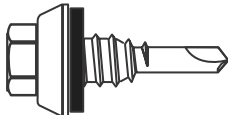
12-14x1" Self Driller
 $\frac{5}{16}$ " Hex Washer Head, with washer

- Outside closure to panel at ridge (with back-up plate)



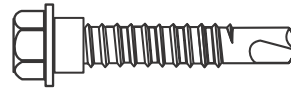
STITCH SCREW
14x $\frac{7}{8}$ " LapTek, with sealing washer

- Ridge and other flashing outside closure
- Gutter to panel
- Gutter to strap
- Trim to trim connections
- Outside closure to panel at ridge (without backup plate)
- Sculptured eave trim to panel



$\frac{1}{4}$ -14x1 $\frac{1}{4}$ " Shoulder TEK[®] 2
 $\frac{5}{16}$ " Hex Washer Head, with no washer

- Rake support to purlin - floating system only



12-24x1 $\frac{1}{4}$ " TEK[®] 4.5 Driller
 $\frac{5}{16}$ " Hex Washer Head, with no washer

- Clip to joist



$\frac{1}{4}$ -20x1 $\frac{1}{4}$ " Shoulder TEK[®] 4
 $\frac{5}{16}$ " Hex Washer Head, with no washer

- Rake support to joist - floating system only





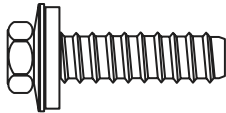
Sure-Lok

ERECTION

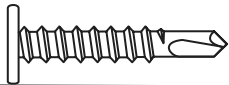
PRODUCT CHECKLIST

1/4x14x1" Type B
 1/4" Hex Washer Head, with 1/2" O.D. washer

- Special application fastener
- For use on structural steel up to 1/2" thick



10x1" #2 Phillips Pancake Head Self Driller



- Utility clip to purlin
- Offset cleat to valley support plate
- Eave condition architectural details

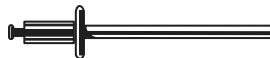
10x1" Type A #2 Phillips Pancake Head Self Driller

- Utility clip to plywood



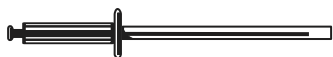
Pop Rivet
 1/8" diameter X 3/16" grip range

- Stainless steel
- Trim to trim connections



Pop Rivet
 1/8" diameter X 3/8" grip range

- Outside closure to angle on floating hip detail



14x1 5/8" Deck Screw Driller
 #3 Phillips Truss Head

- For use in plastic vented ridge assembly
- Fastens offset cleat to outside closure at vent material (not plywood)



14x2 7/8" Deck Screw Driller
 #3 Phillips Truss Head

- For clip attachment in a composite roof assembly
- Fastens clip and bearing plate to metal deck in rigid board insulation over metal deck applications
- Length to be determined by insulation thickness and metal deck depth



14x4 1/2" Deck Screw Driller
 #3 Phillips Truss Head

- For clip attachment in a composite roof assembly
- Fastens clip and bearing plate to metal deck in rigid board insulation over metal deck applications
- Length to be determined by insulation thickness and metal deck depth



14x6" Deck Screw Driller
 #3 Phillips Truss Head

- For clip attachment in a composite roof assembly
- Fastens clip and bearing plate to metal deck in rigid board insulation over metal deck applications
- Length to be determined by insulation thickness and metal deck depth





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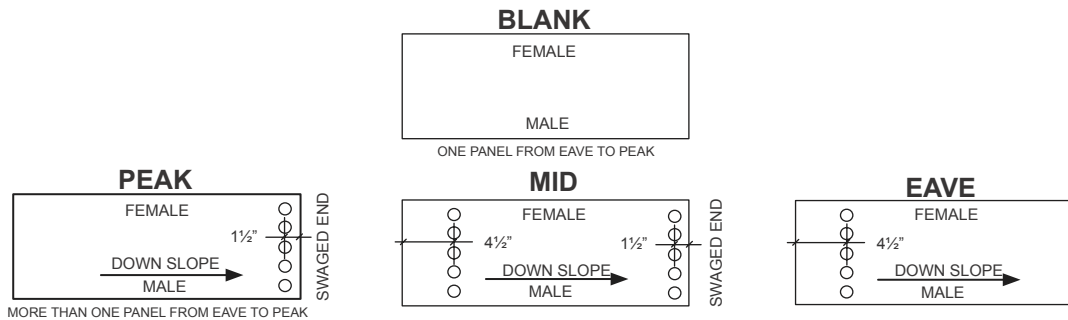
ERECTION

Sure-Lok

Sure-Lok

ORDERING INFORMATION

- I When ordering Sure-Lok panels without technical assistance from USA, the following must be provided:
- A) Panel Length - The length of each panel should include the proper overhang at the eave, endlap, and peak as required. Refer to specific details in this manual for the proper overhang at these locations. If the panels are to be hemmed at the eave, add 1½" to the panel length.
 - B) Standard panel length shall be no more than 45 feet long (for longer length availability, contact USA).
 - C) Panel Designations - Each panel must have a designation to be properly manufactured. These designations are:



- II If your specific detail is not in this manual or if you have questions concerning panel length, designation or product application, call your U.S.A. sales representative.

INSTALLATION GUIDELINES

I. Pre-Order

- A. Prior to ordering panels, all dimensions should be confirmed by field measurement.

II. Jobsite Storage and Handling

- A. Check the shipment against the shipping list.
- B. Damaged material must be noted on Bill of Lading.
- C. Panel crates should be handled carefully. A spreader bar of appropriate length is recommended for hoisting.
- D. Check to see that moisture has not formed inside the bundles during shipment. If moisture is present, panels should be uncrated and wiped dry, then restacked and loosely covered so that air can circulate between the panels.

III. Application Checklist

- A. Check substructure for proper alignment and uniformity to avoid panel distortion.
- B. Periodic check of panel alignment is crucial to proper panel alignment.
- C. If there is a conflict between this manual and the project erection drawings; the erection drawings will take precedence.

IV. LTP Warning

- A. **WARNING:** Light transmitting panels are not designed or intended to bear the weight of any person walking, stepping, standing or resting on them. U.S.A. DISCLAIMS ANY WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, that any person can safely walk, step, stand or rest on or near these light transmitting panels or that they comply with any OSHA regulation.



Sure-Lok

ERECTION

PREPARATORY REQUIREMENTS

1. **USA has field seaming kits available for installation of the Sure-Lok roof system. To reserve a kit, please complete a Sure-Lok Seaming Tool Rental Agreement and return it to your USA representative. This form should be submitted as soon as possible to ensure kit availability. Other types of field seaming machines may properly seam the USA Sure-Lok panels; however, USA cannot be responsible for any damage when another type of field seamer is used.**
2. A single pitch eave strut must be used with the **Sure-Lok** roof system.
3. A rake angle or an alternate structural flat surface must be installed on top of the purlins to accept the rake support.
4. All primary and secondary framing must be erected, plumbed and squared with bolts tightened according to accepted building practices.
5. The substructure (eave to ridge) must be on plane ($\frac{1}{4}$ " in 20' or $\frac{3}{8}$ " in 40' tolerance).
6. It is critical that the purlins or bar joists at the ridge and endlaps be located exactly as detailed and that they are straight from rafter to rafter. Any mislocation or bowing of these members can cause the fasteners at the ridge or endlaps to foul as the panels expand and contract.
7. Peak Purlin Spacing - 24" (12" from the centerline of the ridge to the web of the purlin).
8. For low systems without insulation, $\frac{3}{8}$ " thermal spacers are recommended. For low systems with up to 4" insulation, thermal spacers are not required. Maximum insulation thickness is 4". For high systems with up to 3" of insulation, $\frac{3}{4}$ " or 1" thermal spacers are required. For high systems with more than 3" of insulation, $\frac{3}{8}$ " thermal spacers are required. Maximum insulation thickness is 6".
9. Read recommended installation techniques on page SL1EM-15 and SL1EM-16 before installing panels.
10. USA recommends the use of a screw gun with a speed range of 0-2000 RPM to properly install all fasteners referenced in this manual. Tools rated to 4000 RPM should never be used for self-drilling fasteners typically supplied with metal roof and wall systems.
11. Eave plates for high fixed or high floating systems have been omitted. See job drawings for exact details.

CAUTION

Application and design details are for illustration purposes only, and may not be appropriate for all environmental conditions or building designs. Projects should be engineered to conform to applicable building codes, regulations, and accepted industry practices.

CAUTION

Avoid restricting the thermal expansion and contraction of the Sure-Lok panels. (i.e., Do not attach panel to the substructure at both the eave and ridge.)

WARNING: Light transmitting panels are not designed or intended to bear the weight of any person walking, stepping, standing or resting on them. USA DISCLAIMS ANY WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, that any person can safely walk, step, stand or rest on or near these light transmitting panels or that they comply with any OSHA regulation.



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ERECTION

Sure-Lok

UNLOADING

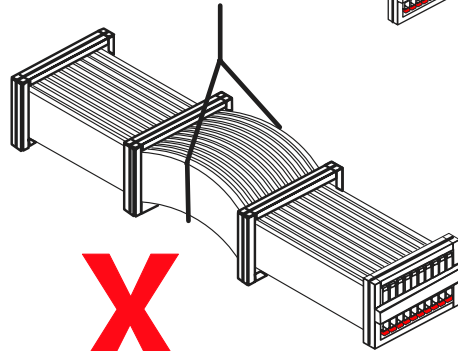
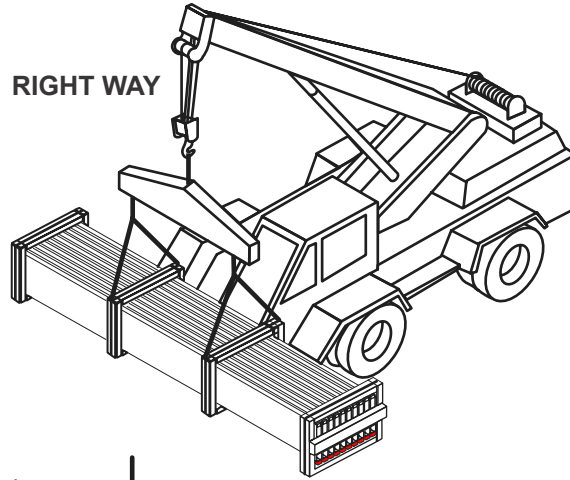
Upon receiving material, check shipment against shipping list for shortages and damages. The manufacturer will not be responsible for shortages or damages unless they are noted on the Bill of Lading.

Each bundle should be lifted at its center of gravity. Where possible, bundles should remain banded until final placement on roof. If bundles must be opened, they should be retied before lifting.

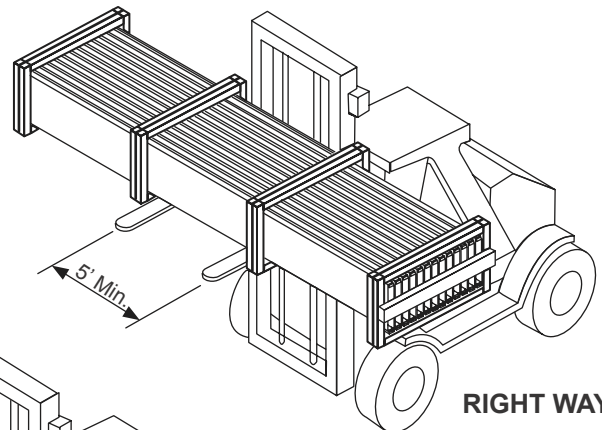
When lifting bundles with a crane, a spreader bar and nylon straps should be used. **NEVER USE WIRE ROPE SLINGS, THEY WILL DAMAGE THE PANELS.**

When lifting bundles with a forklift, forks must be a minimum of five feet apart. Do not transport open bundles. Drive slowly when crossing rough terrain to prevent panel buckling.

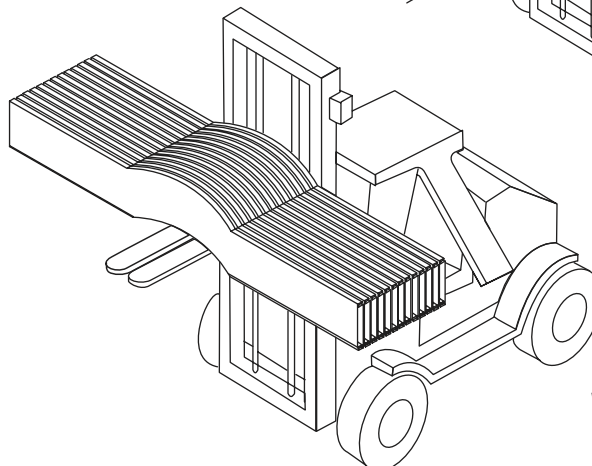
RIGHT WAY



WRONG WAY



RIGHT WAY



WRONG WAY

CAUTION

Panel crates are not designed to support the weight of the panels. Do not use wire rope slings.

CAUTION

Improper unloading and handling of bundles and crates may cause bodily injury or material damage. The manufacturer is not responsible for bodily injuries or material damages during unloading and storage.

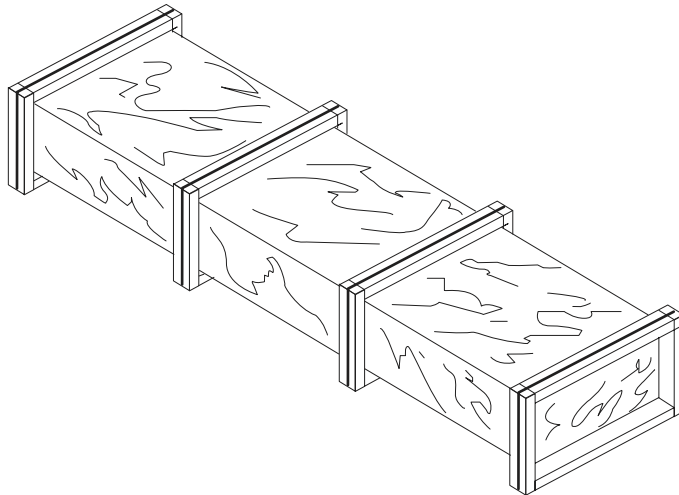
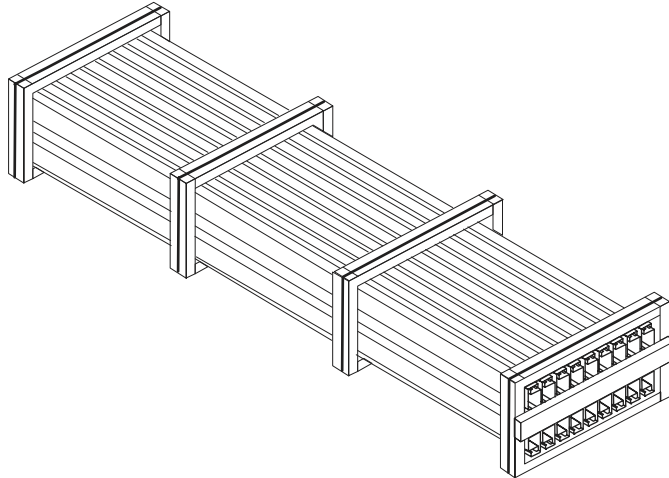
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Sure-Lok

ERECTION



UNLOADING

(continued)

BLOCK AND BAND

This method of bundling is used for orders that are to be picked up by the customer or shipped by common carrier. 2 x 4's are trapped under the bundles to allow access for straps or a forklift. Bundles less than 25' long may be handled by a forklift. The forklift should have at least 5' between forks. Bundles longer than 25' should be lifted utilizing a spreader bar with nylon straps.

FULL CRATE

This method is used on all overseas shipments or by customer's order. Handling requirements are the same as block and band.



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Sure-Lok

HANDLING/ PANEL STORAGE

Standing on one side, lift the panel by the seam. If the panel is over 10' long, lift it with two or more people on one side of the panel to prevent buckling.

Do not pick up by the ends.

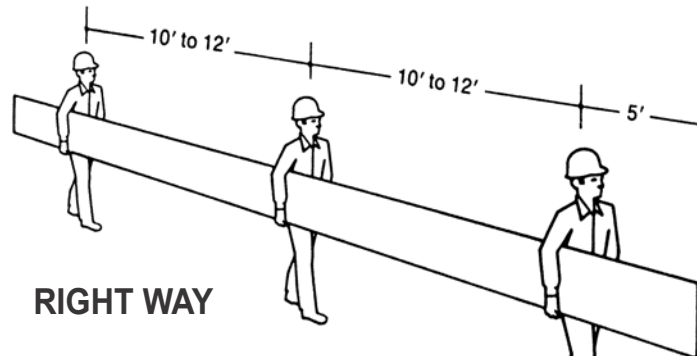
NOTE

Protective gloves should always be used while handling panels. OSHA safety regulations must be followed at all times.

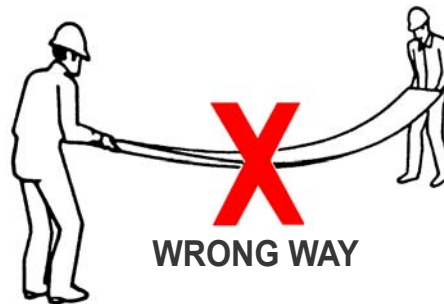
Store bundled sheets off the ground sufficiently high to allow air circulation beneath bundle and to prevent rising water from entering bundle. Slightly elevate one end of bundle. Prevent rain from entering bundle by covering with tarpaulin, making provision for air circulation between draped edges of tarpaulin and the ground. **PROLONGED STORAGE OF SHEETS IN A BUNDLE IS NOT RECOMMENDED.** If conditions do not permit immediate erection, extra care should be taken to protect sheets from white rust or water marks.

Check to see that moisture has not formed inside the bundles during shipment. If moisture is present, panels should be removed from crate and wiped dry, then restack and loosely cover to prevent air from circulating between the panels.

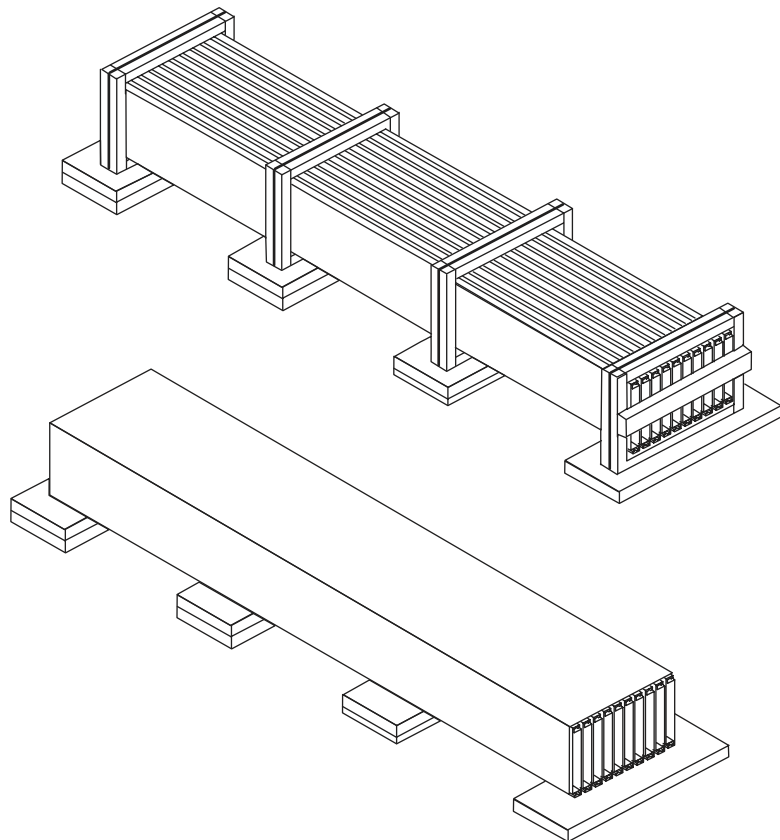
Special care must be given during handling to avoid damage to the locking edges of the panels.



RIGHT WAY



WRONG WAY





Sure-Lok

ERECTION

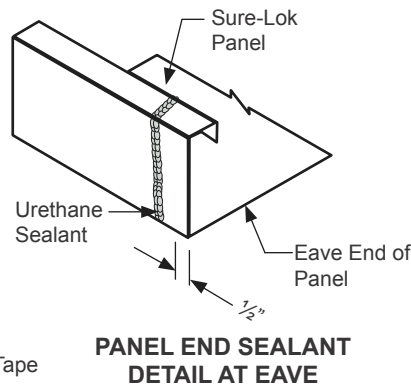
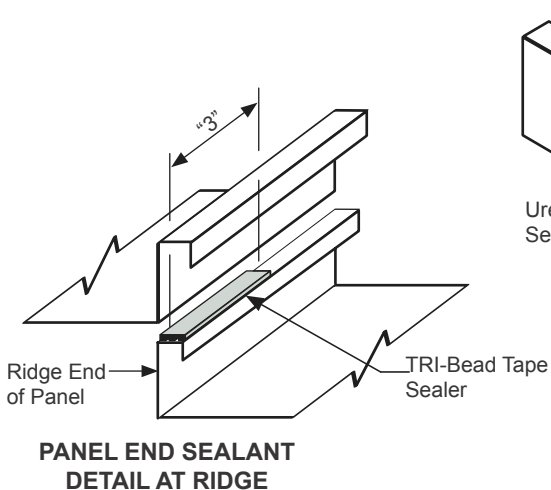
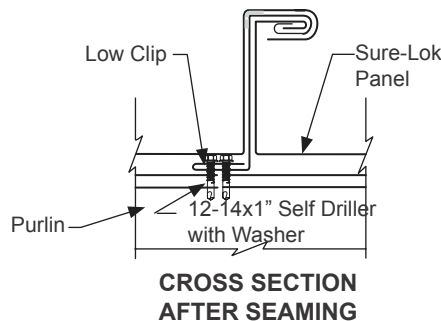
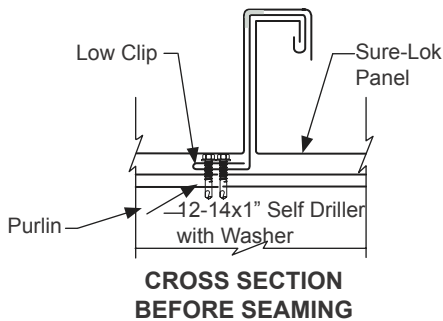
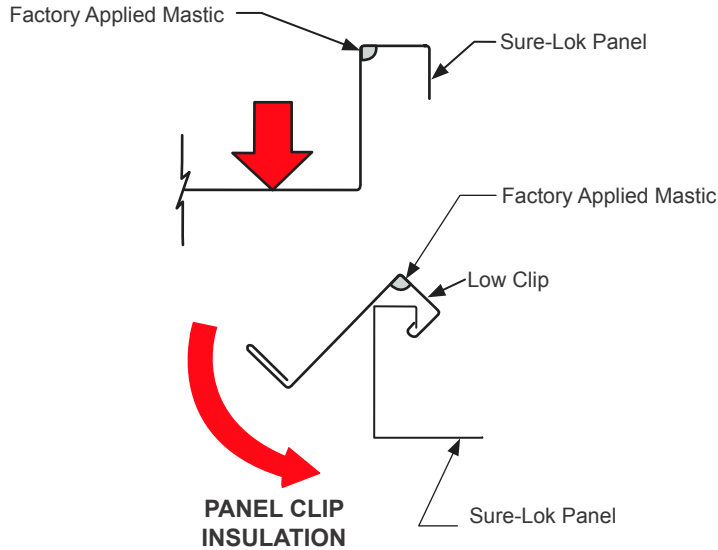
RECOMMENDED INSTALLATION TECHNIQUES

Sure-Lok clips are supplied with factory applied mastic. If a clip must be removed from the panel, check factory mastic - if damaged, replace with a bead of urethane sealant.

As panels are installed, hand seam at each clip with hand tool. Panels should be completely seamed with electric seamer as soon after installation as possible. Refer to pages SL1EM-31 through SL1EM-33 for seaming information.

Seal panel seams at eave and valleys with urethane sealant.

Seal panel seams at ridge by applying a piece of TRI-Bead tape sealer along the top of the male leg before the next panel is installed. Tape sealer should begin at the upper end of the peak panel and extend downslope 7" when using the High Side Eave Detail. For all other ridge details, tape sealer will extend 3" downslope.





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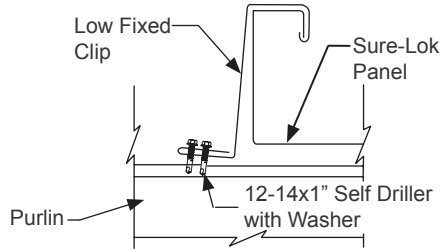
RECOMMENDED INSTALLATION TECHNIQUES

(continued)

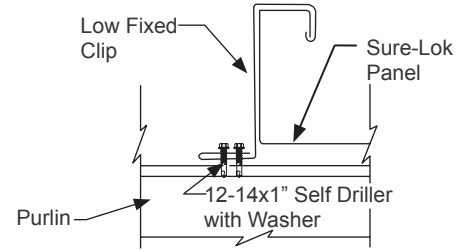
When installing clips, be sure to push them tight to the panel before installing fasteners. If you leave a gap between the clip and the panel, it will affect panel module.

Before installing clips to second and all following panels, C clamp the panel seam at both ends. Long panels may require one or more C clamps in the middle. This will help hold panel module.

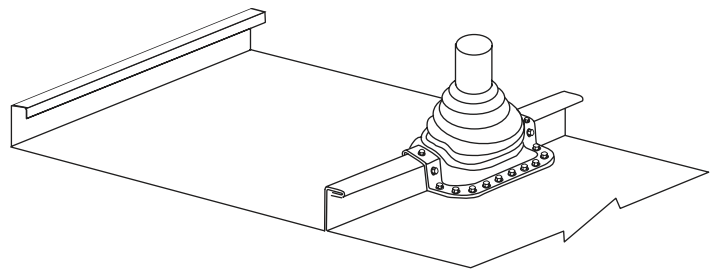
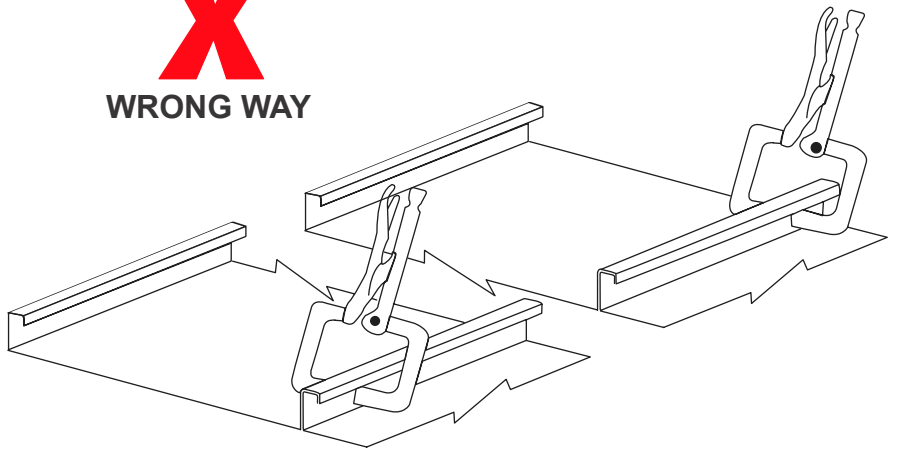
Never install plumbing vent pipes through the panel seam. Always install in the pan of the panel. If the pipe is too large to allow adequate water flow down the panel, install the pipe in a roof curb.



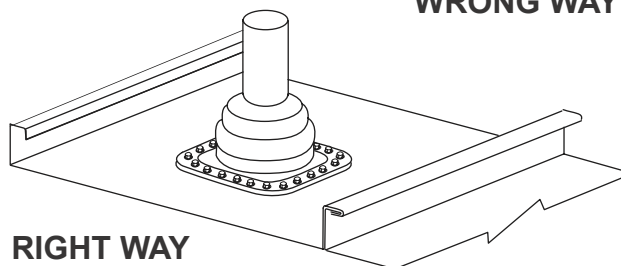
X
WRONG WAY



RIGHT WAY



X
WRONG WAY

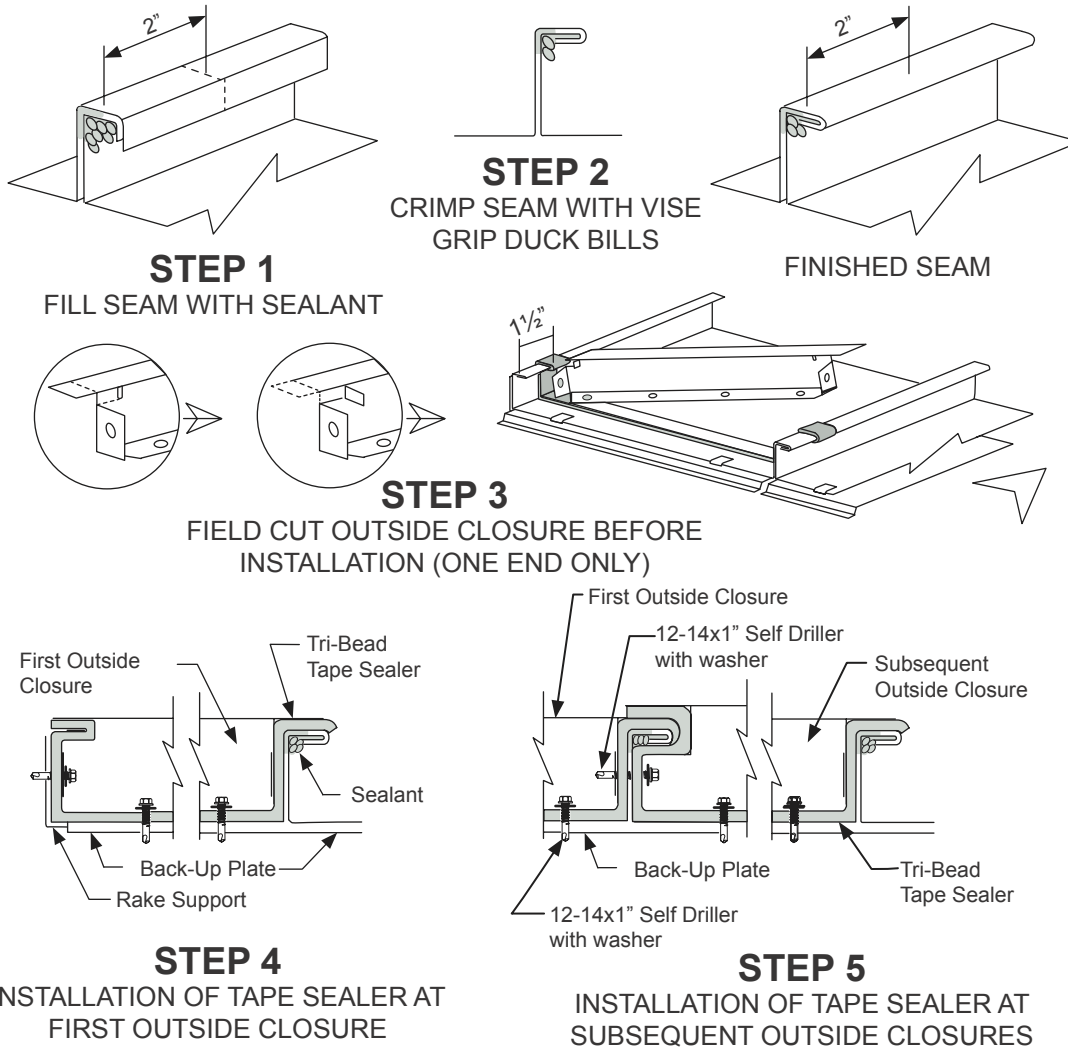


RIGHT WAY

Sure-Lok

ERECTION

TYPICAL DETAILS OUTSIDE CLOSURE



NOTES

- 1. Panels must be seamed before the outside closures are installed.** Do not seam the first 6" to 12" of panel at the ridge with the electric seamer. This will allow the panel seams to be properly sealed as outlined in the following steps.
- At the ridge, fill the inside cavity of the panel seam with urethane sealant or Tri-Bead tape sealer as outlined in Step 1. This should be done for the first two inches of seam only.
- Using the hand crimper, crimp the remaining 6" to 12" of seam. If needed, vice grip duckbills may be used to further flatten the seam in Step 2. This will force the urethane sealant into all voids. Excess sealant will be forced out below the seam.
- Install Tri-Bead tape sealer across width of panel. Center of tape sealer should be 1½" from end of panel. Begin tape sealer at top of seam. Roll tape sealer under seam, sealing to the excess urethane sealant forced from seam in Step 3. Tape sealer will continue down seam, across width of panel, up to and across the top of the adjacent seam. Field cut the end of the outside closure that accepts the seam of the panel. Cut the top leg off even with the tab on the end of the closure. Notch and bend the vertical leg of the closure, above the tab, back to the dimple formed into the closure.
- Install first outside closure. Attach to panel with 12-14x1" Self Driller (with back-up plate or hip plate) or 12-14x1" Self Driller at all pre-punched holes. Vertical leg of outside closure should be 2" from end of panel.
- Install Tri-Bead tape sealer across top leg of first outside closure where it laps over seam and continue tape sealer across next panel as outlined in Step 4. Field cut and install next and all subsequent outside closures as outlined in Steps 4 and 5.



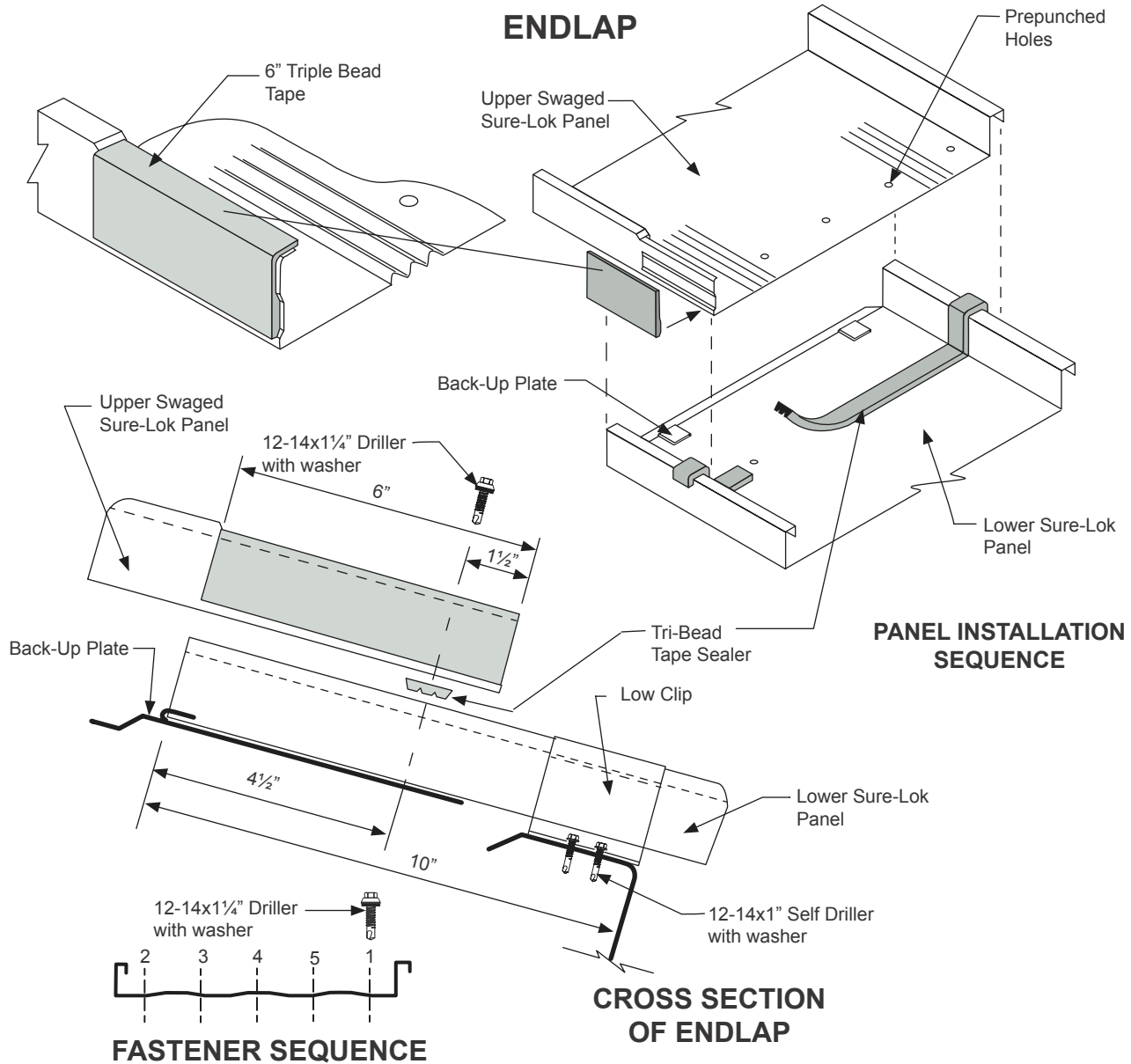
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ERECTION

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TYPICAL DETAILS ENDLAP



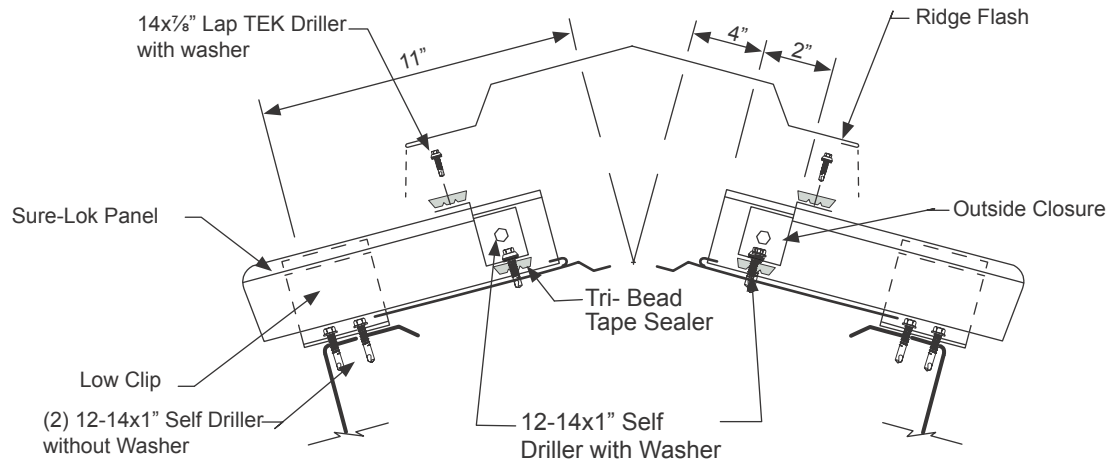
NOTES

1. Install bottom panel so that the eave has the proper overhang (refer to eave details). The upslope end of the panel should be 10" from the web of the purlin.
2. Slide a prepunched back-up plate onto the end of the panel; make sure the teeth on top of the back-up plate are on top of the panel. Visually check to see that the holes in the back-up plate align with the prepunched holes in the panel.
3. Place Tri-Bead tape sealer over the entire width of the panel. It must be centered directly over the prepunched holes.
4. Apply triple bead tape sealer to swaged vertical leg of upper panel. Pigtail portion of tape sealer must lap over vertical leg of panel.
5. Using an awl to align the holes, install top panel by nesting it over the lower panel. Install Fastener - 12-14x1 $\frac{1}{4}$ " Driller with washer in the prepunched holes in the proper sequence.
6. Endlaps require roof erection to proceed from right to left as viewed from the eave looking toward the ridge.

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ERECTION

TYPICAL DETAILS RIDGE



NOTES

1. Do not use this detail with the hemmed panel method of attachment at the eave or valley.
2. Install back-up plate onto end of panel.
3. Install outside closures as shown on page SL1EM-17.
4. Install Tri-Bead tape sealer to top leg of outside closure.
5. Attach ridge flash to outside closure with a 14x7/8" Lap Tek at 6" o.c.
6. See "Panel End Sealant Detail at Ridge" on page SL1EM-15 to seal panel seams at ridge.



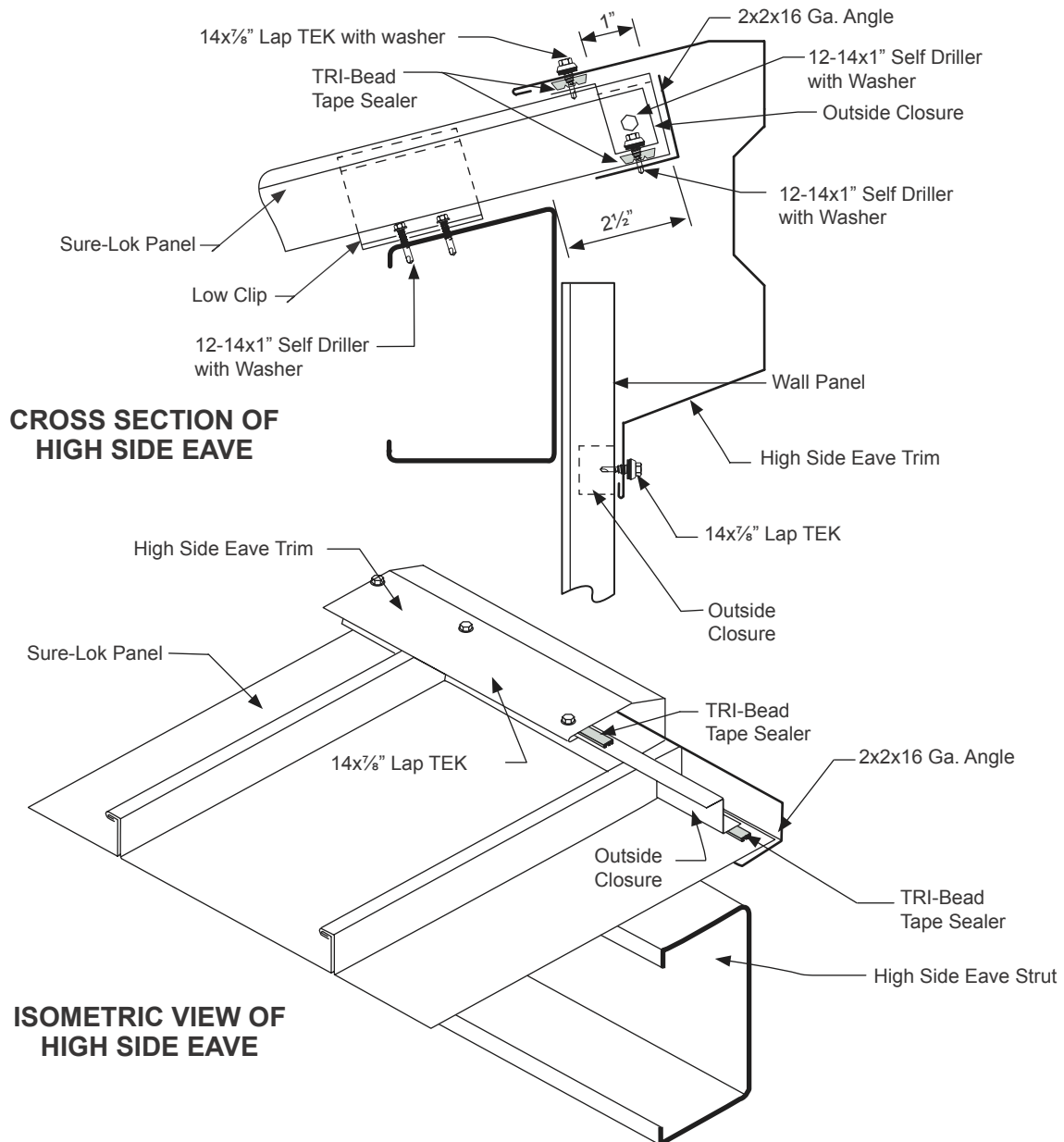
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ERECTION

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TYPICAL DETAILS HIGH SIDE EAVE



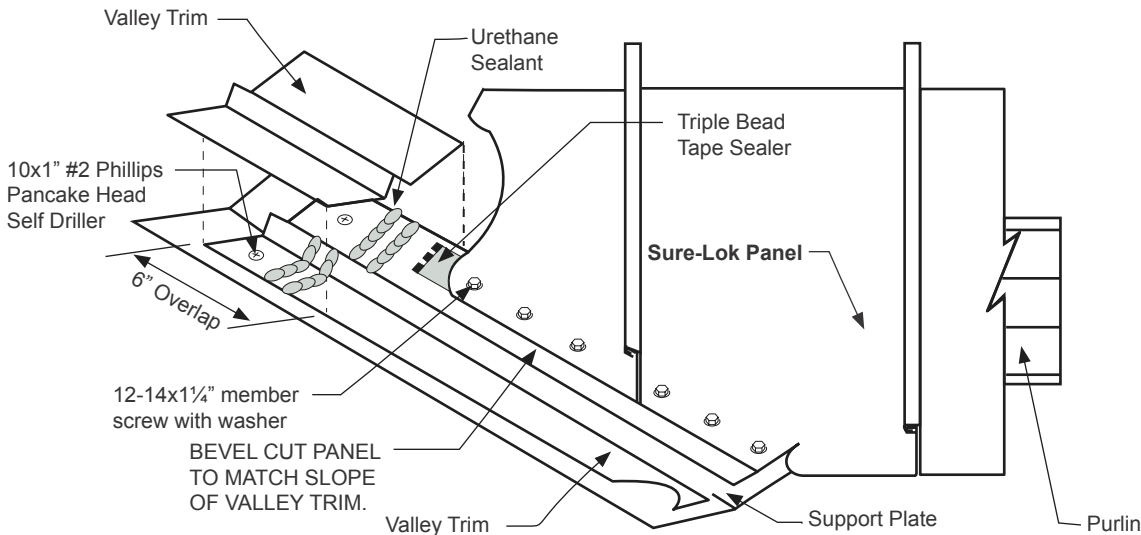
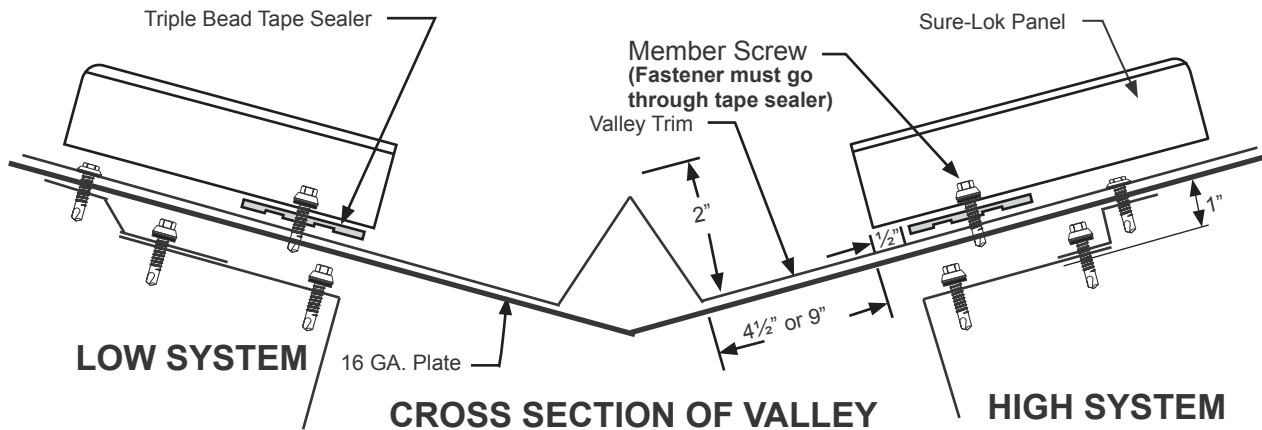
NOTES

1. Do not use this detail with the hemmed panel method of attachment at the eave or valley.
2. Install outside closures as shown on page SL1EM-17 with the following exceptions:
 - A. Align edge of tape sealer with end of panel.
 - B. Vertical leg of outside closure is 1" from end of panel.
 - C. Attach outside closure to 2"x 2" angle with Fastener - 12-14x1" Self Driller with washer.
3. Install Tri-Bead tape sealer to top leg of outside closure.
4. Attach high side eave trim to outside closure with Fastener - 14x7/8" Lap TEK at 6" o.c.
5. Attach eave trim to wall panels with Fastener - 14x7/8" Lap TEK at each high rib.
6. See "Panel End Sealant Detail at Ridge" on page SL1EM-15 to seal panel seams at ridge.

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TYPICAL DETAILS VALLEY



ISOMETRIC VIEW OF LOW VALLEY

NOTES

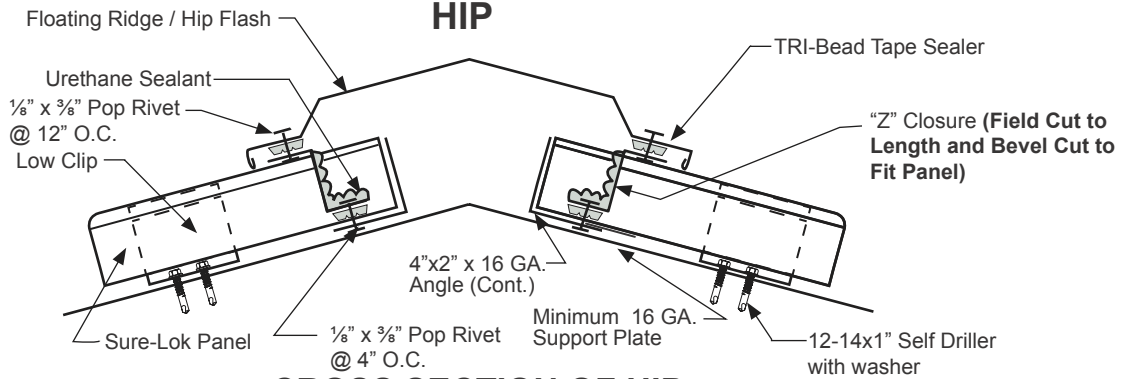
1. For valleys over 30', use extended valley trim.
2. Install 16 gauge valley plate to top of purlins. Attach valley trim to valley plate with a $\frac{1}{8} \times \frac{3}{8}$ Pop Rivet to hold in place until panels are installed.
3. Bevel cut panels to match slope of valley.
4. Mark panel line location on valley trim and install triple bead tape sealer $\frac{1}{2}$ " back from this mark.
5. Use a 12-14x1 $\frac{1}{4}$ " Member Screw with washer at valley 3" o.c. Fastener must go through tape sealer.
6. To prevent condensation, valley plate should be insulated.
7. See "Panel End Sealant Detail at Eave" on page SL1EM-15 to seal panel ends at valley.
8. The valley trim shown in the High System detail should not be used with "Dead Valleys".
9. On High Systems, overhang the panels $\frac{1}{2}$ " downslope from the 1" vertical leg of the valley trim to keep water off of upper leg of valley trim.



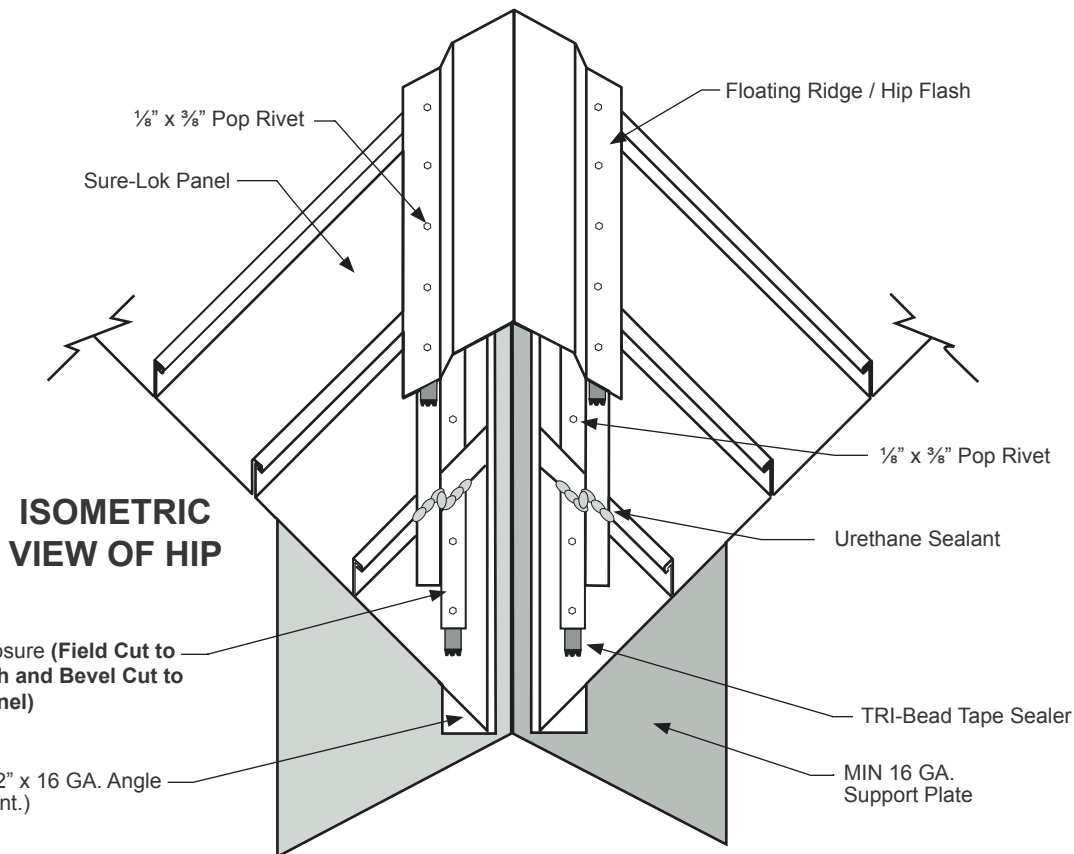
ERECTION

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TYPICAL DETAILS FLOATING or FIXED HIP



CROSS SECTION OF HIP



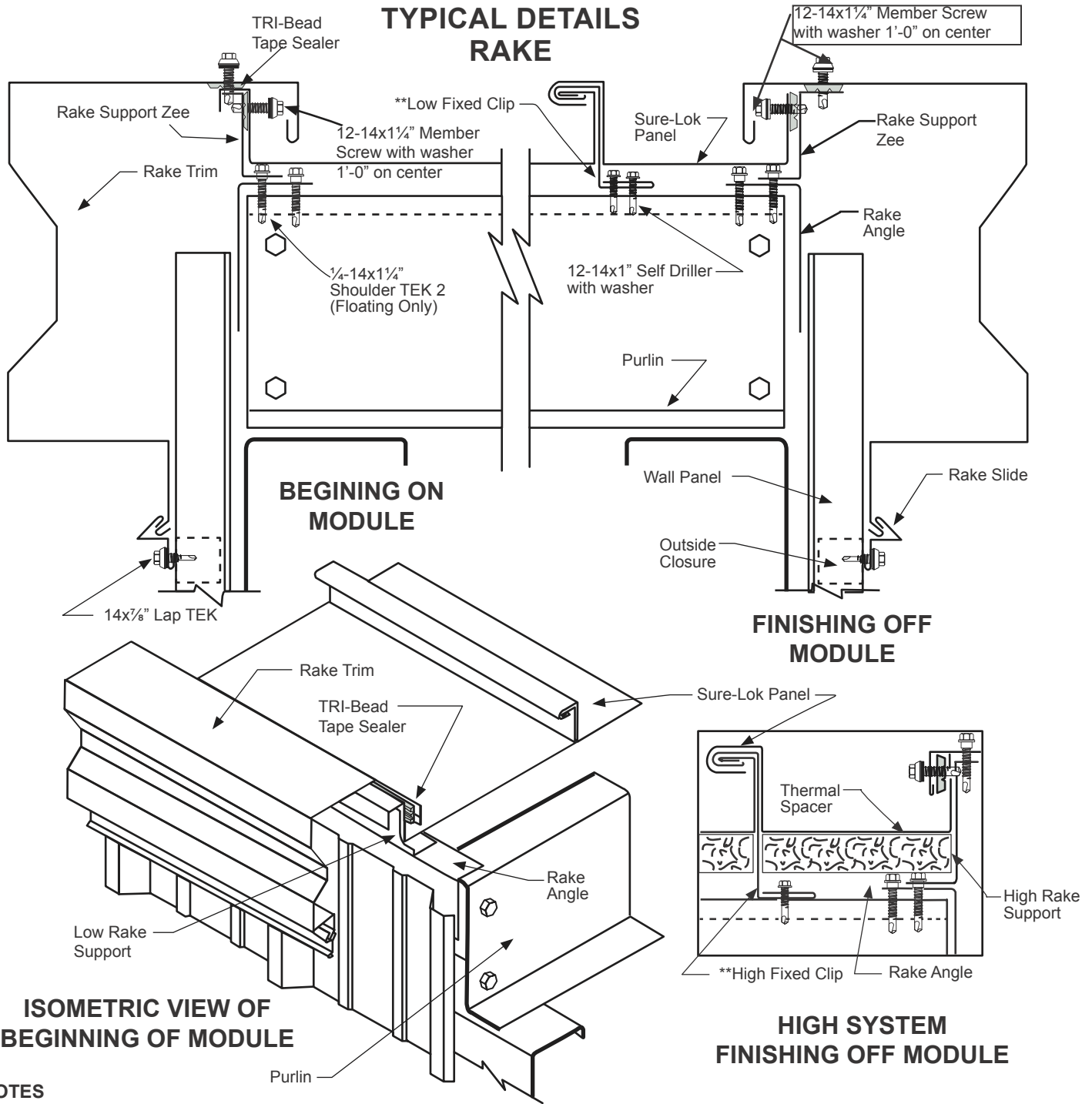
ISOMETRIC VIEW OF HIP

NOTES

1. Hip must have a support plate to reinforce panels between purlins.
2. Bevel cut and install panels to follow slope of hip.
3. Install Tri-Bead tape sealer to pans of panels, running parallel to the hip. Center of tape sealer should be 5½" from center of hip.
4. Slide a length of 4" x 2" x 16 gauge angle under pan of panels. Do not fasten 4" x 2" angle to hip support plate. This will restrain the panels from floating.
5. Bevel cut and install Z" closures to panels and 4" x 2" angle with a $\frac{1}{8}$ x $\frac{3}{8}$ Pop Rivet at 4" o.c. Vertical leg of "Z" closure should be 6" from center of hip. Seal sides and top of "Z" closures to panel seams with urethane caulk.
6. See "Panel End Sealant Detail at Ridge" on page SL1EM-15 to seal panel seams at ridge.

Sure-Lok

ERECTION



NOTES

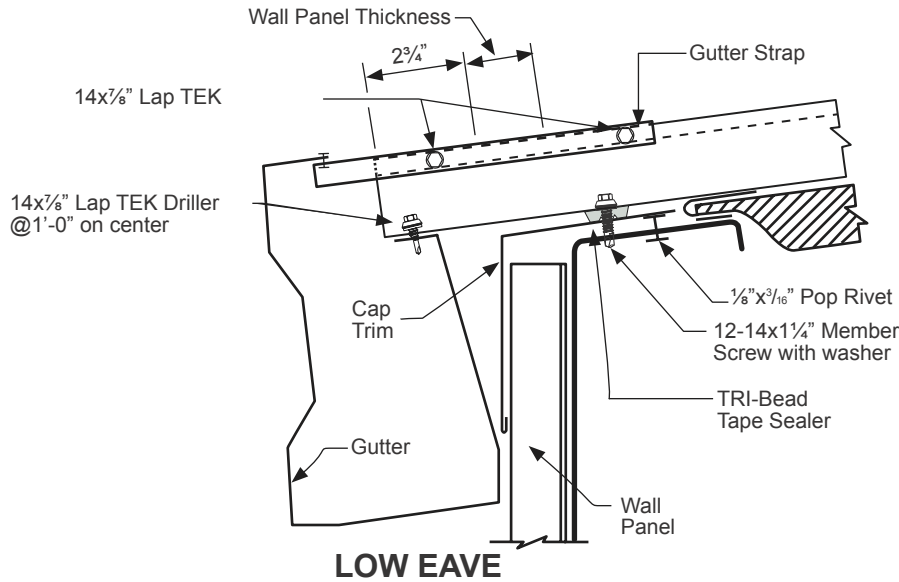
1. Install rake support with 12-14x1 1/4" Member Screw at 1'-0" o.c.
2. Engage female leg of panel over rake support.
3. Apply Tri-Bead tape sealer to vertical leg of panel.
4. Install rake trim with 12-14x1 1/4" Member Screw at 1'-0" o.c. Fastener must go through rake support.
5. Attach rake slide to wall panels with 14x7/8" Lap TEK at each high rib.
6. If roof finishes on module, finishing detail will be similar to starting detail except, field cut top of panel rib so only the vertical leg of the panel remains. If roof finishes off module, field cut and bend last panel to fit against rake support.
7. Attach roof panel to rake support with 12-14x1 1/4" Member Screw at 1'-0" o.c.



ERECTION

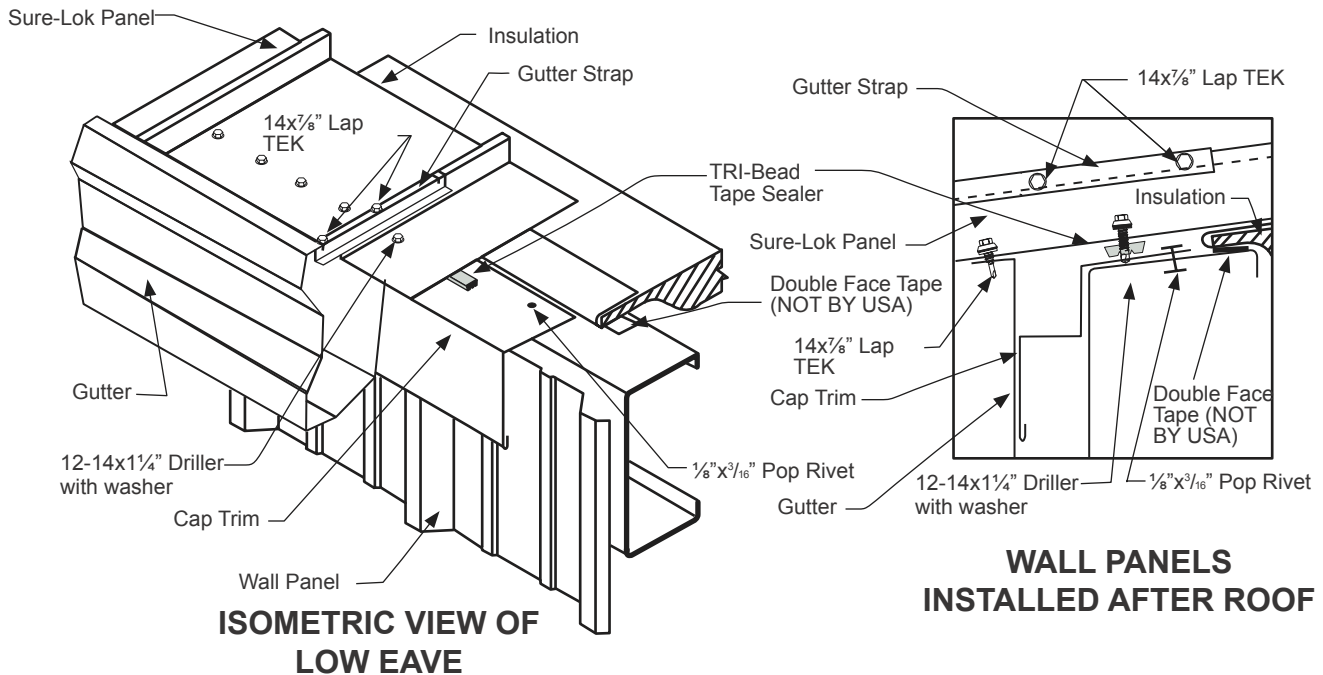
Sure-Lok

TYPICAL DETAILS GUTTER



Top of Eave Strut should be at the same elevation as the bottom of the roof panel. No eave plates required.

LOW EAVE



ISOMETRIC VIEW OF LOW EAVE

WALL PANELS INSTALLED AFTER ROOF

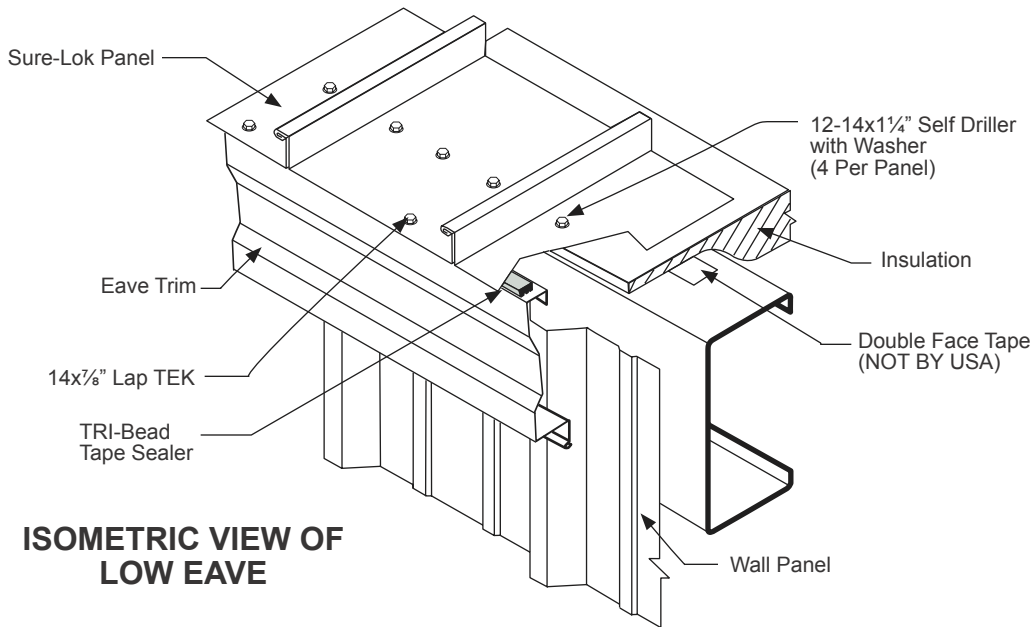
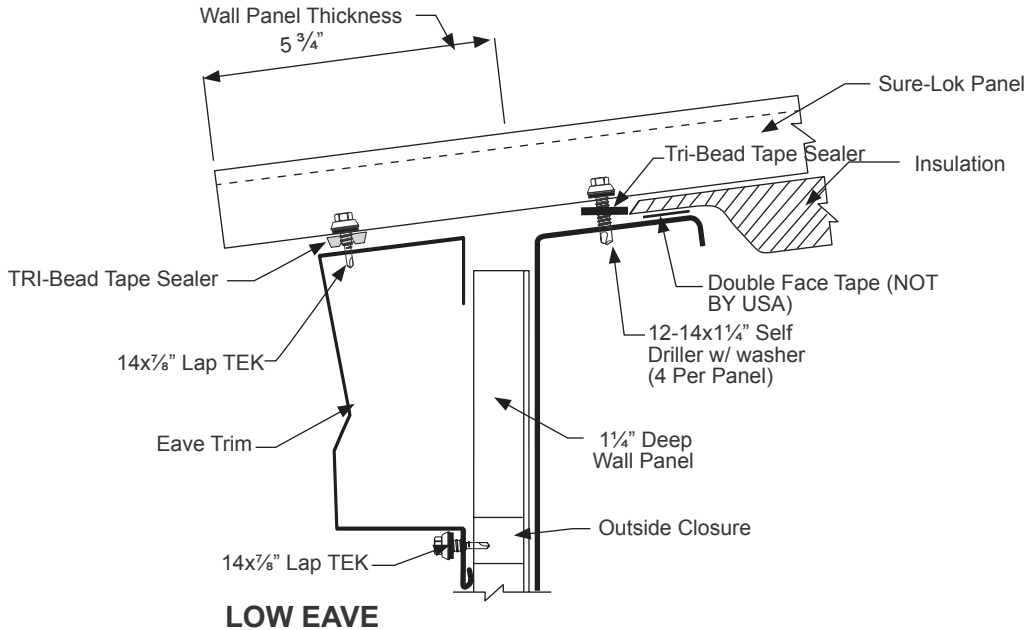
NOTES

1. Panel overhang at eave is 2 3/4" plus wall panel thickness.
2. Fasten the box panel cap trim to the eave strut with Fastener 1/8" x 3/16" Pop Rivet at both ends and the middle. Locate the fastener 1/2" from the rear sheared edge of the trim.
3. Attach panel to eave strut with 12-14x1 1/4" Member Screw with washer. Four fasteners are required at this location.
4. Fasten gutter to Sure-Lok panels with 14x7/8" Lap TEK at 1'-0" o.c.
5. Gutter straps should be installed every other panel seam with 14x7/8" Lap TEK.
6. The above gutter should not be used in areas that experience snow loads of 10 PSF or higher.
7. See "Panel End Sealant Detail at Eave" on page SL1EM-15 to seal panel ends.
8. When wall panels are to be installed after roof, use offset panel cap trim in lieu of box panel cap trim. The offset panel cap is designed to work with "PBR" or "PBA" panels. Other panel types will require a special offset panel cap trim.

Sure-Lok

ERECTION

TYPICAL DETAILS EAVE TRIM



NOTES

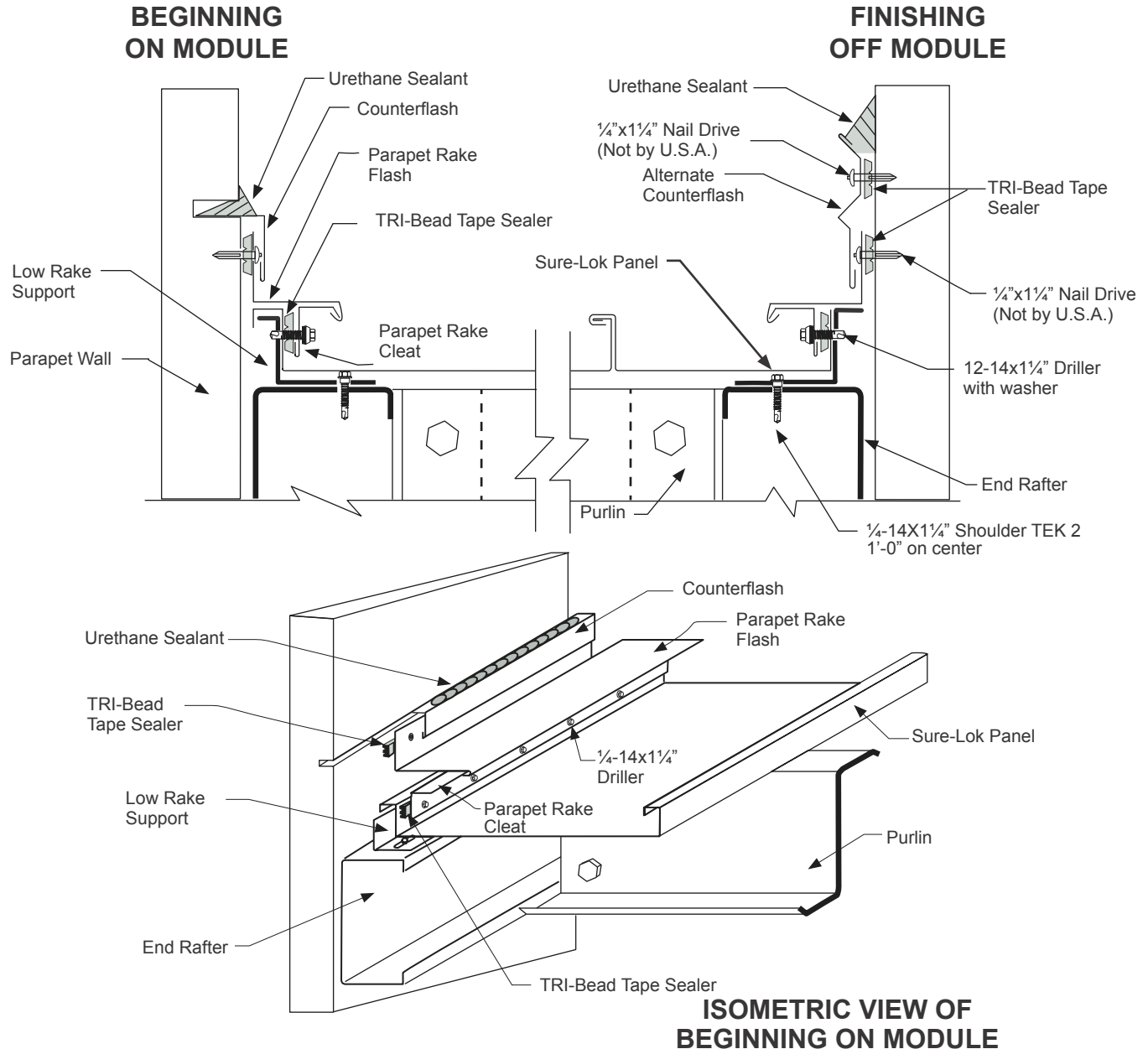
1. Panel overhang is 4 1/2" plus wall panel thickness.
2. Attach sculptured eave trim to Sure-Lok panel with 14x7/8" Lap TEK at 12" o.c.
3. Attach bottom of sculptured eave trim to wall panels with 14x7/8" Lap TEK at each high rib.
4. See "Panel End Sealant Detail at Eave" on page SL1EM-15 to seal panel ends.



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TYPICAL DETAILS PARAPET RAKE



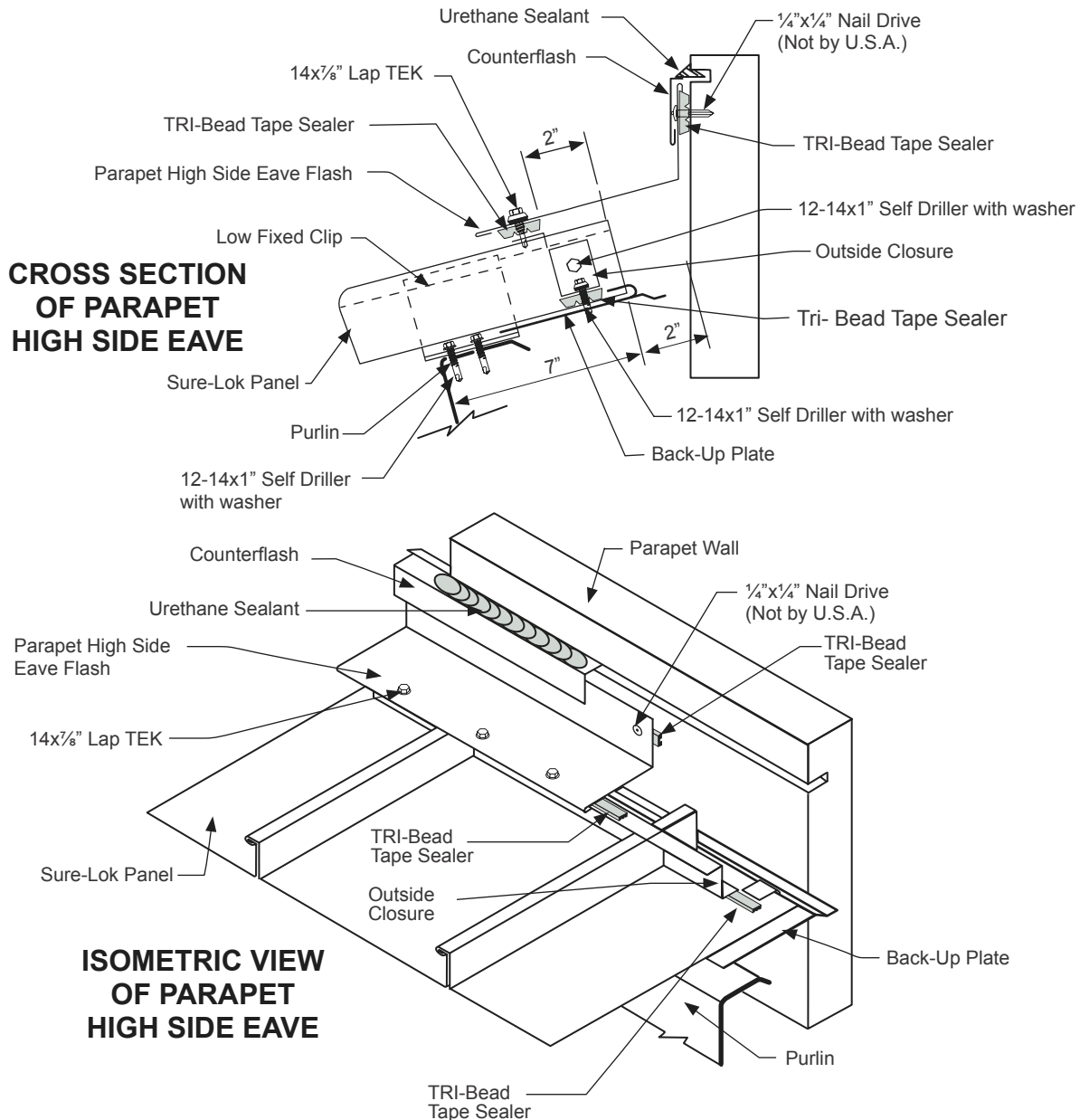
NOTES

1. Install rake support with 12 -14x1 1/4" Shoulder TEK 2 at 1'-0" o.c.
2. Engage female leg of panel over rake support.
3. Apply Tri-Bead tape sealer to vertical leg of panel. Install parapet rake cleat to panel leg with Fastener 12-14x1 1/4" Driller with washer at 1'-0" o.c. Fasteners must go through rake support.
4. Install parapet rake flash by engaging open hem over parapet rake cleat. Tie vertical leg of parapet rake flash to parapet wall with Fastener - 1/4"X1 1/4" Nail Drive (Not by U.S.A.) .
5. If roof finishes on module, finishing detail will be similar to starting detail except, field cut top of panel rib so only the vertical leg of the panel remains. If roof finishes off module, field cut and bend last panel run to fit against rake support. Install tape sealer, parapet rake cleat, and parapet rake flash as previously described.
6. If parapet rake flash is not to be immediately installed, temporarily fasten panels to rake support to prevent wind damage.

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TYPICAL DETAILS PARAPET HIGH SIDE EAVE



NOTES

1. Do not use this detail with the hemmed panel method of attachment at the eave or valley.
2. Install back-up plate onto end of panel.
3. Install outside closures as shown on page SL1EM-17.
4. Install Tri-Bead tape sealer to top leg of outside closure.
5. Attach parapet high side eave flash to outside closure with Fastener - 14x7/8" Lap TEK at 6" o.c. Tie vertical leg of parapet high side eave flash to parapet wall with Fastener - 1/4"x1/4" Nail Drive (Not by U.S.A.).
6. See "Panel End Sealant Detail at Ridge" on page SL1EM-15 to seal panel seams at ridge.



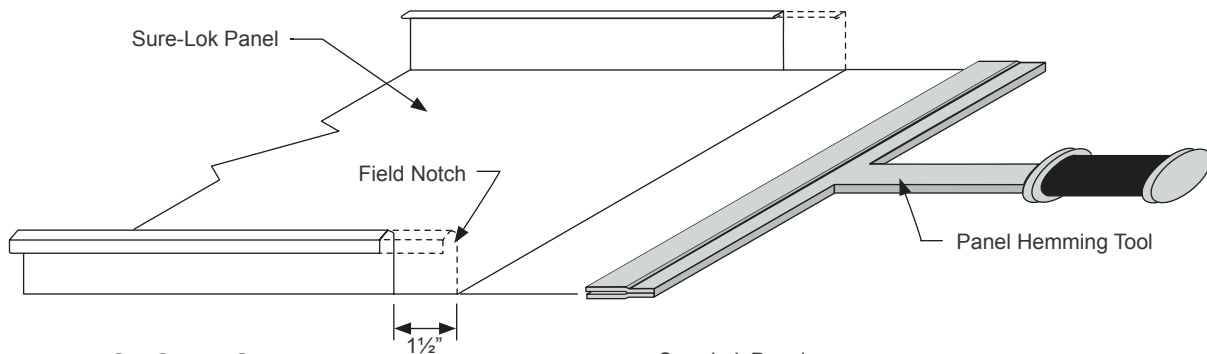
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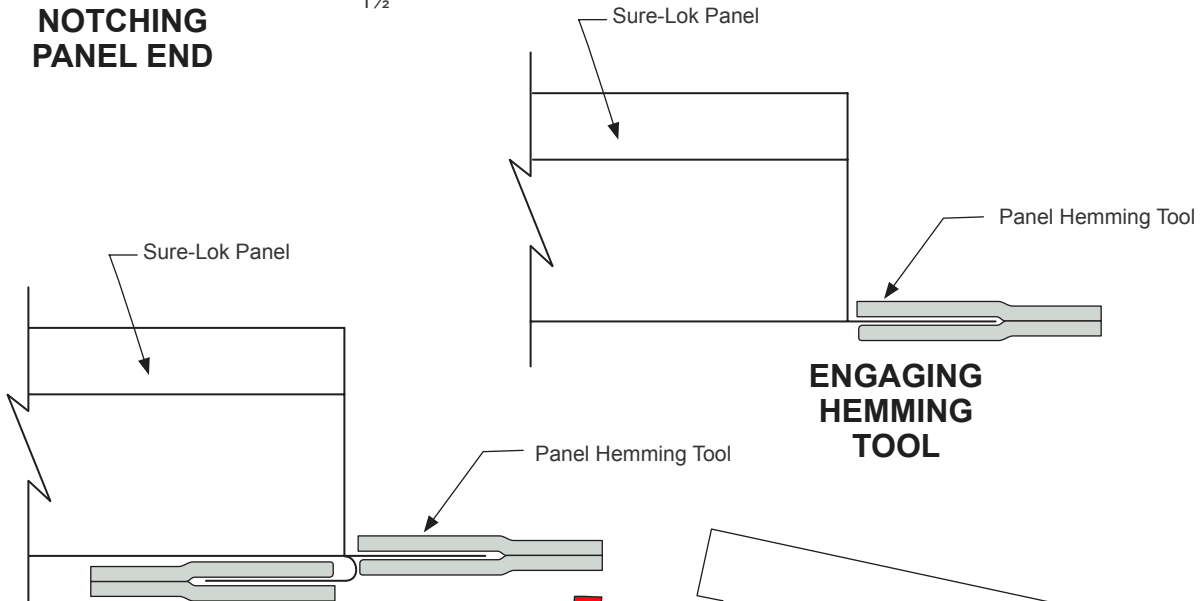
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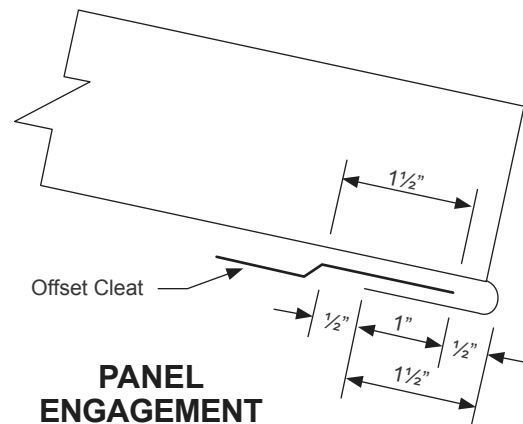
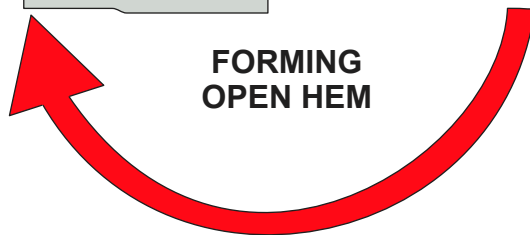
TYPICAL DETAILS FIELD HEMMING PANEL END



NOTCHING PANEL END



ENGAGING HEMMING TOOL



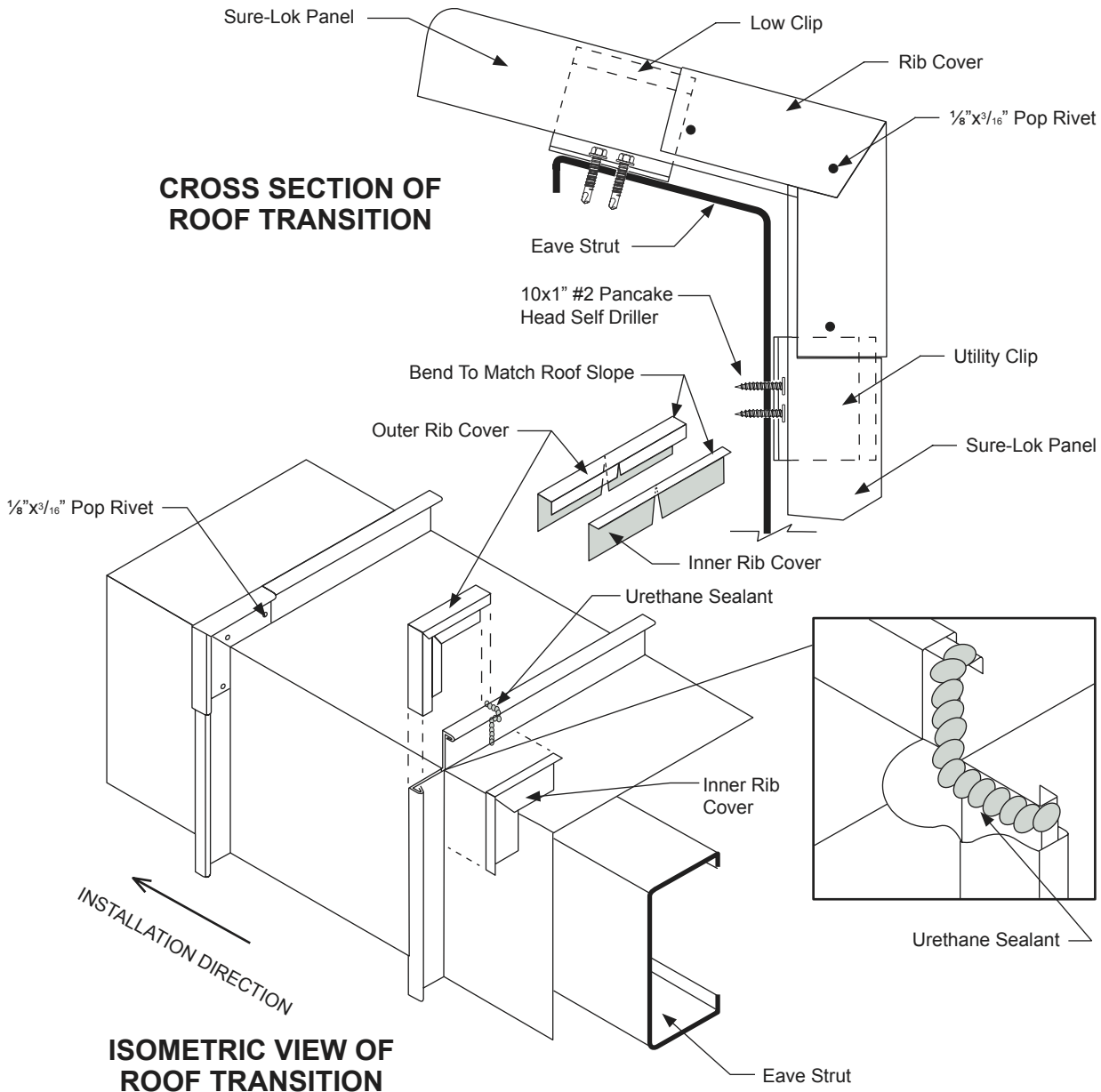
NOTES

1. Field notch male and female legs of panel 1 1/2".
2. Engage panel hemming tool onto protruding pan of panel.
3. Bend pan of panel down to form an open hem.
4. Hem may be tightened with a pair of vise grip "duck bills".
5. Panel engagement shown above is for panel slope lengths up to 100' long. For panel slope lengths over 100' long, please call USA.

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TYPICAL DETAILS TRANSITION



NOTES

1. Field cut legs of panels and bend to required angle.
2. Apply urethane sealant to both the roof portion and fascia portion of the male leg of the panel before the next panel is installed.
3. Bend inner and outer rib covers to match the roof transition.
4. Field apply a bead of urethane sealant over rib before installing rib covers.
5. Pop rivet inner and outer rib covers to rib of panel.
6. Using vise grip duckbills, crimp the outer rib cover to match the roof and fascia seams.
7. Do not use this detail inside the building envelope.



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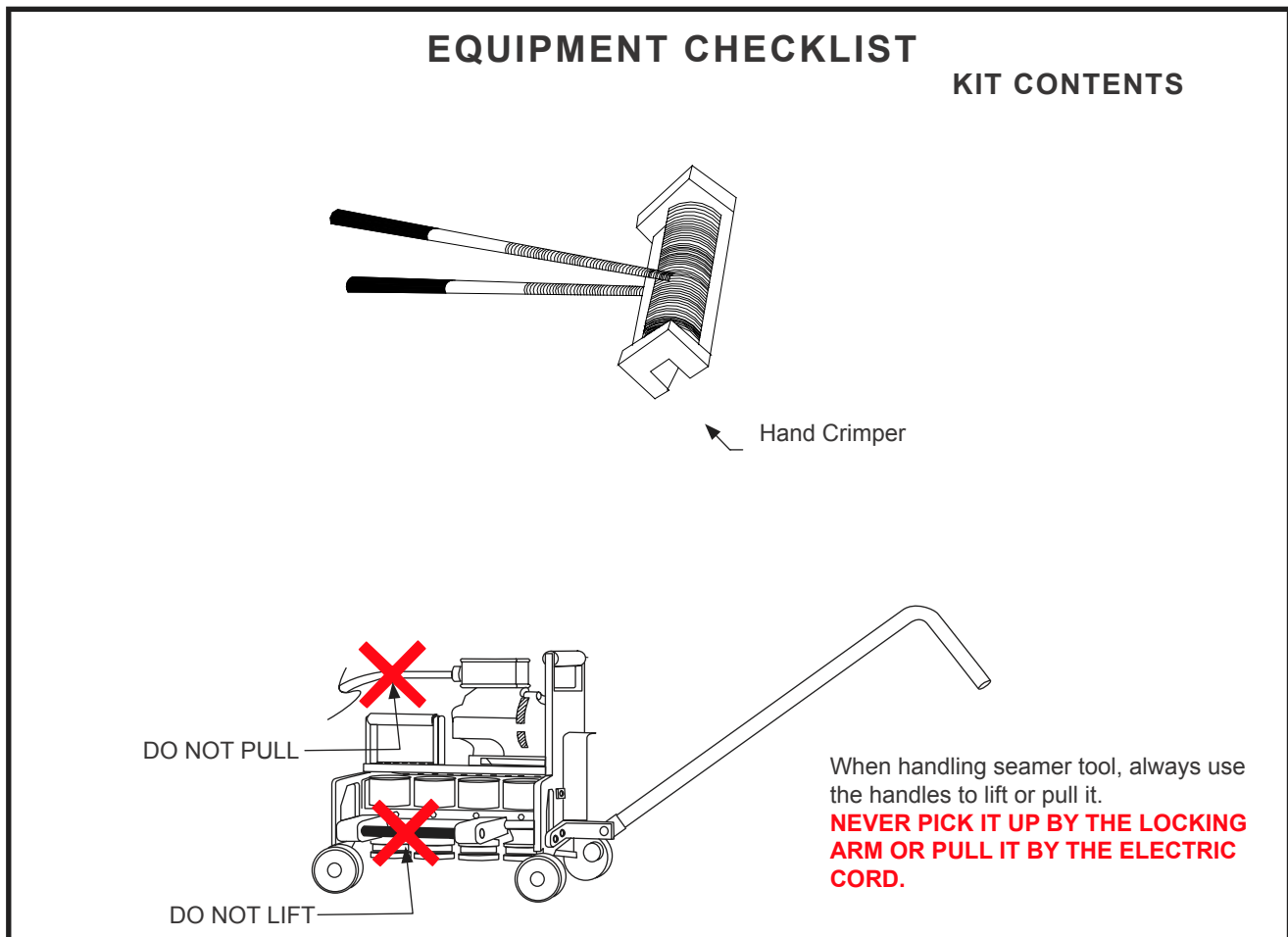
Sure-Lok SEAMING INFORMATION

USA has field seaming kits available for installation of the Sure-Lok roof system. To reserve a kit, please complete a Sure-Lok Seaming Tool Rental Agreement and return it to your USA representative. This form should be submitted as soon as possible to ensure kit availability. Other types of field seaming machines may properly seam the USA Sure-Lok panels; however, USA cannot be responsible for any damage when another type of field seamer is used.

The seamer comes in a specially designed box accompanied by a field manual and a hand crimper. **READ THE FIELD MANUAL THOROUGHLY BEFORE STARTING THE SEAMING OPERATION. FAILURE TO ADHERE TO THESE INSTRUCTIONS WILL RESULT IN DAMAGE TO THE SEAMER AND/OR PANELS. THE CUSTOMER WILL BE HELD LIABLE FOR ANY COSTS INCURRED FOR REPLACEMENT OR REPAIR.**

PRE-SEAMING INFORMATION FOR REVERSABLE SEAMER

1. Locate field manual in seamer box and review operational procedures.
2. Locate power source and check against power requirements in field manual.
3. Check seams for proper engagement.
4. Clean dirt, debris and excess sealant from seams and panel surfaces to avoid interfering with the seaming operation.
5. Panels must be hand crimped at each clip as they are installed to prevent their separation by a strong wind. Also, crimp seams at all endlaps. Panels should be seamed with electric seaming tool as soon as possible after installation.





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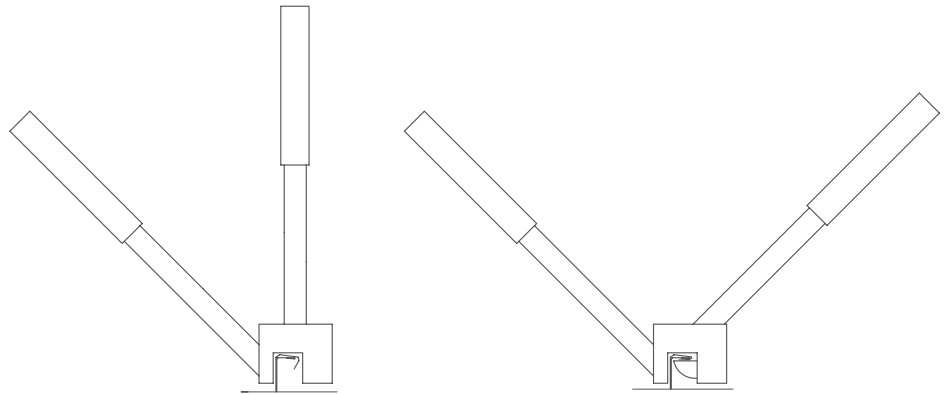
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CRIMPING OPERATION

As panels are installed, hand crimp with hand crimper at each clip. Panels should be completely seamed with electric seamer as soon as possible. It is critical that the panel seams are crimped and folded as shown before using the electric seamer. Failure to follow these guidelines will result in damaged seams.

Set the hand crimper on the seam. Align the edge of the crimper with the end of the panel. The fixed handle on the hand crimper should be at an angle on the smooth side of the seam. The movable handle should be vertical. Move the movable handle away from the fixed handle to its full allowable movement, crimping the female leg. This should be done three times for a total of 18 inches.

The seam is now ready to accept the electric seamer.



Hand Crimper

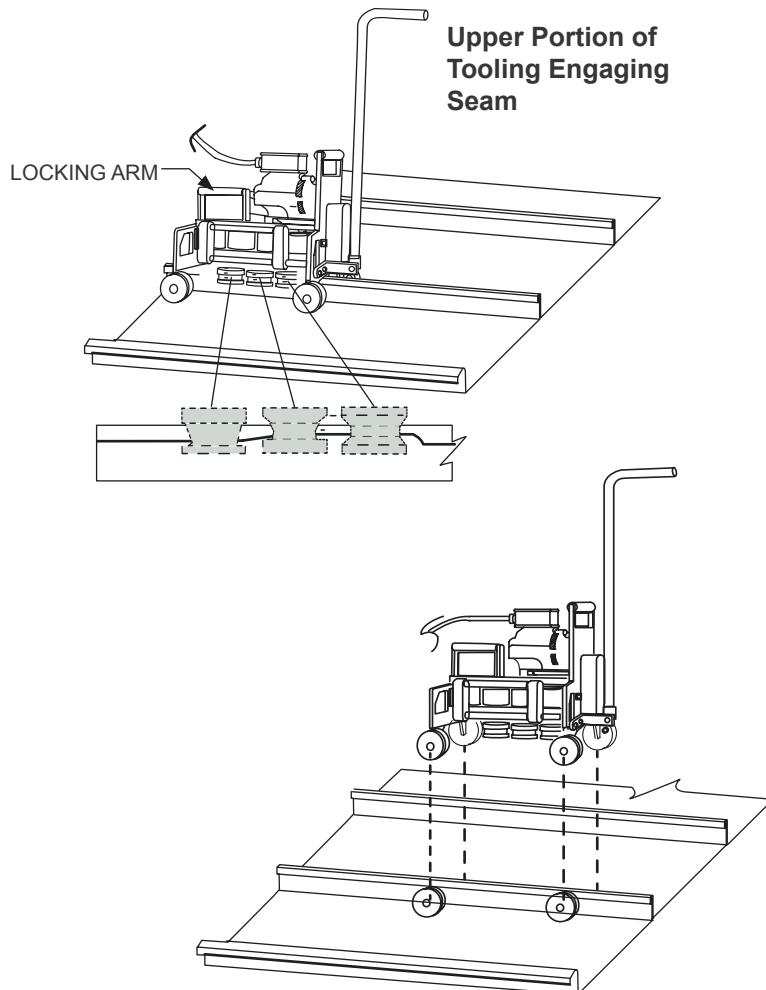
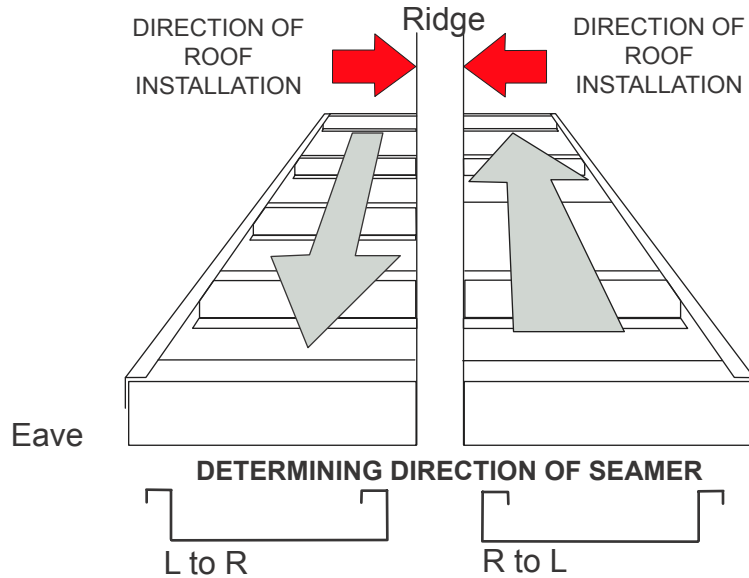


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SEAMING OPERATION

There are two types of seamers for the Sure-Lok panel. One runs in only one direction and the other runs in both directions. The instructions for the individual seamer will be in the seamer box. **When roof has endlaps, panels will always run left to right. When roof slope is 4 on 12 or greater, panels must run left to right.**

To begin seaming, set seamer on seam with the locking bar up and to the flat side of the seam. The rear wheels should be even with the edge of the roof panel. Push the locking bar down to engage the rolls and turn the seamer on.

Stop seamer 6" to 12" from the end of the panels. Disengage locking bar and remove the electric seamer. Finish seam with the hand crimper.

CAUTION
Seamer operation should be closely supervised at all times. A safety tag line should be attached to the seamer.

