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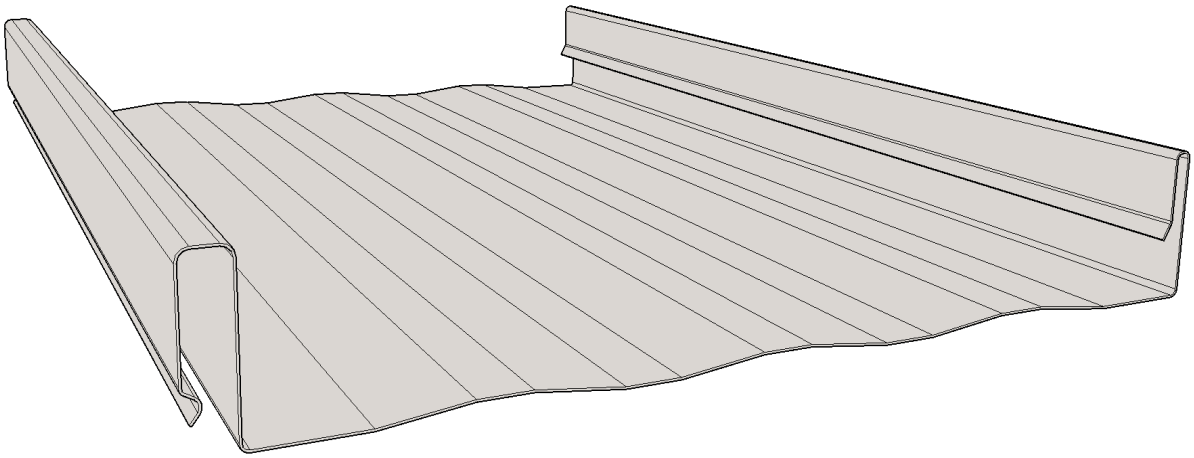
Narrow Formed Seam 16

TECHNICAL/ERECTION INFORMATION



NFS-16

IMPORTANT NOTICE

READ THIS MANUAL COMPLETELY PRIOR TO BEGINNING THE INSTALLATION OF THE NARROW FORMED SEAM 16 ROOFING SYSTEM. ALLIANCE STEEL, INC. DETAILS MUST BE FOLLOWED AS A MINIMUM TO INSURE APPROPRIATE WARRANTIES WILL BE ISSUED.

ALWAYS INSPECT EACH AND EVERY PANEL AND ALL ACCESSORIES BEFORE INSTALLATION. NEVER INSTALL ANY PRODUCT IF ITS QUALITY IS IN QUESTION. NOTIFY ASI IMMEDIATELY IF ANY PRODUCT IS BELIEVED TO BE OUT OF TOLERANCE, SPECIFICATION OR HAS BEEN DAMAGED DURING SHIPMENT.

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

Ice Dam Disclaimer

Alliance Steel, Inc. (ASI) designs its standing seam roofs to meet the load requirements dictated by governing codes and project specifications, including applicable snow loads. However, ASI expressly disclaims responsibilty for weathertightness or roof point loading issues or other hazards resulting from ice dam situations. Any time ice and snow can melt on the main body of the roof and refreeze at the eave or in the shadow of an adjacent wall, an ice dam situation may develop. In addition to local climate, ice dam formation is affected by many other factors, including but not limited to, roof insulation R value, roof panel color, interior temperature of building, heater location in building, eave overhangs, parapet walls, shading of building roof areas from adjacent trees, parapets, buildings, etc. These factors are design and maintenance issues and are outside the control of ASI. ASI specifically disclaims any liability for damage due to ice dam formation, although the following issues should be taken into consideration concerning standing seam roofs installed in freezing climates:

- Eliminate “cold” eave overhangs and parapet walls from the building design. Roof overhangs outside the heated envelope of the building will tend to be colder than the roof areas over the heated envelope. Simple roof designs are preferred. Parapet walls at the eave allow ice and snow to collect due to shading effects and the lower roof temperatures caused thereby.

- Make sure the interior of the building is adequately insulated and the heating is properly distributed. Inadequate insulation in the roof and/or improper heat distribution causes heat flow though the main body of the roof. On days when the temperature is below freezing, this heat gain can cause ice and snow to melt and refreeze at the eave where the roof is colder.

- Lay out the building to prevent the eaves and other roof areas from being shaded during the winter. This may mean eliminating adjacent trees or reconsidering roof geometries.

- Consider using self-regulating heating cables at the eaves and valleys to mitigate the effects of ice dams.

- On building designs using attics, over-insulate the attic floor and provide adequate ventilation in the attic. This will reduce heat transfer through the roof resulting in more consistent roof temperatures between eave and field of roof.

- Use roof ice and water shield type underlayment materials at roof areas prone to icing. This may include valleys, eaves, dormers and roof areas near dormers, parapets and the like where shading may occur.

The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the North American Specification for the Design of Cold-Formed Steel Structural Members published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contact the manufacturer.

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, ASI reserves the right to discontinue products at any time or change specifications and/or designs without incurring obligation. **To ensure you have the latest information available, please inquire or visit our website at www.allianceokc.com.** Application details are for illustration purposes only and may not be appropriate for all environmental conditions, building designs or panel profiles. Projects should be designed to conform to applicable building codes, regulations and accepted industry practices. If there is a conflict between this manual and project erection drawings, the erection drawings will take precedence.

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E.0 ENGINEERING

E.1 Architect/Engineering Information

Narrow Formed Seam 16 (NFS-16) Panel Information

1.) Narrow Formed Seam 16 (NFS-16) is only available in 16" widths with striations.
2.) Minimum recommended slope is 3:12 pitch, whether over open framing or on solid substrate (wood or composite).
3.) NFS-16 is a UL90 rated structural roofing panel. The panel can be installed over purlins, or bar joists. The panel does not require a solid substrate. A solid substrate with ice & water shield type underlayment is recommended.
4.) If installing NFS-16 Panels over open framing with faced fiberglass blanket insulation:
   A.) Install insulation parallel to purlins or bar joists.
   B.) Install insulation across the purlins or bar joists then compress it with "pinch bars".
   C.) 1/4" thick radiant barrier insulation may be used as an alternative to blanket insulation.
5.) NFS-16 Panels cannot be end lapped at the current time. Maximum single panel length without prior approval is 55'-0". For panel runs longer than 55'-0" consider using A-Lok 16 Standing Seam Panels.
6.) NFS-16 Panels can be installed on roofs with transitions by using die-formed rib covers. Check for color availabilities.
7.) Standard gauge is 24-gauge with striations. Heavier 22-gauge may be available upon request and pre-approval. Minimum quantities are required for the heavier gauge material. **OIL CANNING IS NOT A CAUSE FOR REJECTION.**
8.) The substrate must be on plane with a tolerance of 1/4" in 20'-0" or 3/8" in 40'-0".
9.) NFS-16 Panel requires two (2) fasteners per UL90 clip per location. Be sure proper fastener is utilized for the substrate application.
10.) All panels require gun grade sealant vertically between the panel ribs (Tite–Bond or ASI approved equal) at the eave and valley conditions. For illustration purposes this sealant may not be shown on all drawings. See detail on page 37.
11.) All drawings and trim depth in manual are based on 1 1/4" wall depth (PBR Panel) and a slope of 3:12. Other wall depths and different roof slopes may affect various dimensions on illustrative drawings and trim.
12.) Avoid restricting the thermal expansion and contraction of the NFS-16 Panels. Do not thru fasten to substructure at both the ridge and eave.
13.) Avoid any unnecessary foot traffic on NFS-16 Panels. The NFS-16 Panels are not designed to be work platforms. If foot traffic is required protect the roof panels by using some type of roof pad, temporary deck or walkway.
14.) A vapor barrier (to be supplied by others) may be necessary to protect roof components when high interior humidity is a factor. The need for a vapor retarder, as well the type, placement and location should be determined by an architect or engineer. The following examples may require a vapor barrier:
   A.) Projects where outside winter temperatures below 40 degrees F are anticipated and where average winter interior humidity of 45% or greater is expected.
   B.) Building usage with high humidity interiors, such as indoor swimming pools, textile manufacturing operations, and food processing industrial plants.
   C.) Construction elements that may release moisture after roof is installed, such as interior concrete and masonry, plaster finishes and fuel burning heaters.
15.) The information presented is believed to be correct and accurate. It should not be used for any specific application without being reviewed by a registered professional engineer. All metal roofs should be designed by a registered professional engineer for loads specified by the governing code, including the higher pressures encountered at the edge/corner zones of the roof.
16.) Typical clip spacings for 24-guage NFS-16 Panels are 4'-0" on center for open framing, 3'-0" maximum on center over water proof membrane on 5/8" (minimum) plywood or 4'-0" maximum on center for board-deck composite systems. The project location may determine the requirement of additional clips at closer spacing due to high wind uplift corner/edge zone conditions or codes.

E.0 ENGINEERING

E.2 UL 90 Requirements

UNDERWRITERS LABORATORIES APPROVAL

Construction Number	Gauge	Clip Type	Clip Spacing	Substrate	UL-2218 Impact Resistance	UL-263 Fire Rating	UL-580 Rating
255	24 min.	UL 90	4'-0"	Open Framing	Class 4	Class A	Class 90
303	24 min.	UL 90	4'-0"	Composite System	Class 4	Class A	Class 90
342	24 min.	UL 90	4'-0"	Composite System	Class 4	Class A	Class 90
343	24 min.	UL 90	3'-0"	Plywood	Class 4	Class A	Class 90
414	24 min.	UL 90	3'-0"	Plywood	Class 4	Class A	Class 90
436	24 min.	UL 90	4'-0"	Plywood	Class 4	Class A	Class 90
446	24 min.	UL 90	4'-0"	Open Framing	Class 4	Class A	Class 90
448	24 min.	UL 90	4'-0"	Composite System	Class 4	Class A	Class 90
486	24 min.	UL 90	4'-0"	Composite System	Class 4	Class A	Class 90
543	24 min.	UL 90	4'-0"	Open Framing	Class 4	Class A	Class 90
544	24 min.	UL 90	4'-0"	Composite System	Class 4	Class A	Class 90

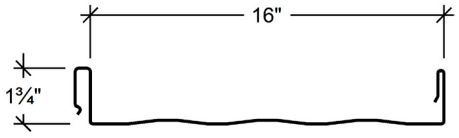
NOTES:

1. Wind uplift test 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
3. Roofing Materials and Systems Directory. The panels must be installed in a certain manner to achieve the published results.
4. The panel qualifies for a Class A fire rating in compliance with Underwriters Laboratories Standard UL-263.
5. The panel system is listed under following Fire Resistance Design Numbers: P225, P227, P230, P237, P265, P268, P508, P510, P512, P701, P711, P720, P722, P726, P731, P734, P801, P815, P819. Refer to the UL Fire Resistance Directory for specific construction methods and hourly ratings.
6. **Narrow Formed Seam 16** Panels carry a Class 4 rating under UL-2218 "Test Standard For Impact Resistance".

E.0 ENGINEERING

E.3 Properties Tables

NFS-16



SECTION PROPERTIES								
			NEGATIVE BENDING			POSITIVE BENDING		
PANEL GAUGE	Fy (KSI)	WEIGHT (PSF)	Ixe (IN.4/FT.)	Sxe (IN.3/FT.)	Maxo (KIP-IN.)	Ixe (IN.4/FT.)	Sxe (IN.3/FT.)	Maxo (KIP-IN.)
24	50	1.34	0.0361	0.0452	1.3527	0.0758	0.0519	1.5570
22	50	1.71	0.0500	0.0665	1.9938	0.1052	0.0731	2.1921

NOTES:

1. All calculations for the properties of NFS 16 panels are calculated in accordance with the 2012 edition of the North American Specification for Design of Cold-Formed Steel Structural Members.
2. Ixe is for deflection determination.
3. Sxe is for bending.
4. Maxo is allow able bending moment.
5. All values are one foot of panel width.

E.4 Load Tables

ALLOWABLE UNIFORM LOADS IN POUNDS PER SQUARE FOOT

24-Gauge (Fy = 50 KSI)								
SPAN TYPE	LOAD TYPE	SPAN IN FEET						
		2.5	3.0	3.5	4.0	4.5	5.0	5.5
SINGLE	LIVE LOAD	166.1	115.3	84.7	64.9	51.3	41.5	34.4
2-SPAN	LIVE LOAD	144.8	100.5	73.9	56.6	44.7	36.2	29.8
3-SPAN	LIVE LOAD	181.0	125.7	92.3	70.7	55.9	45.2	37.4
4-SPAN	LIVE LOAD	169.0	117.3	86.2	66.0	52.1	42.2	34.9

22-Gauge (Fy = 50 KSI)								
SPAN TYPE	LOAD TYPE	SPAN IN FEET						
		2.5	3.0	3.5	4.0	4.5	5.0	5.5
SINGLE	LIVE LOAD	200.0	162.4	119.3	91.3	72.2	58.5	48.3
2-SPAN	LIVE LOAD	200.0	147.7	108.5	83.1	65.6	53.2	43.9
3-SPAN	LIVE LOAD	200.0	184.6	135.6	103.8	82.0	66.5	54.9
4-SPAN	LIVE LOAD	200.0	172.4	126.6	97.0	76.6	62.1	51.3

NOTES:

1. Allowable loads are based on uniform span length and Fy = 50 KSI.
2. LIVE LOAD is limited by bending, shear, combined shear and bending.
3. Above loads consider a maximum deflection ratio of L/180.
4. The weight of the panel has not been deducted from the allowable loads.
5. THE ABOVE LOADS ARE NOT FOR USE WHEN DESIGNING PANELS TO RESIST WIND UPLIFT.
6. Please contact manufacturer or manufacturer's website for most current allowable wind loads.
7. The use of any field seaming machine may damage panels, void all warranties and will void all engineering data.
8. This panel is not seamed.

The Engineering data contained herein is for the expressed use of customers and design professionals. Along with this data, it is recommended that the design professional have a copy of the most current version of the *North American Specification for the Design of Cold-Formed Steel Structural Members* published by the American Iron and Steel Institute to facilitate design. This Specification contains the design criteria for cold-formed steel components. Along with the Specification, the designer should reference the most current building code applicable to the project jobsite in order to determine environmental loads. If further information or guidance regarding cold-formed design practices is desired, please contract the manufacturer.

SUBJECT TO CHANGE WITHOUT NOTICE

1.0 GENERAL

1.1 Purpose of the Installation Guide

This Installation Guide is provided to ***Alliance Steel, Inc.*** customers and their erectors as the recommended procedure for the correct assembly of the ***Narrow Formed Seam 16*** Roof System.

This guide is intended to be used in conjunction with the project's Erection Drawings to help plan and organize the installation of the *Narrow Formed Seam 16* Roof System. The Erection Drawings identify the applicable roof conditions and govern specific part arrangements. This Installation Guide will help you identify parts, establish the installation sequence, demonstrate correct assembly, and point out any areas or procedures requiring special emphasis or attention.

This Installation Guide applies to the standard *Narrow Formed Seam 16* Roof System. Custom roof conditions, including custom details and instructions, will be covered by the Erection Drawings. **In case of conflict between this Installation Guide and the Erection Drawings, the Erection Drawings will have precedence.**

1.2 Customer's Responsibility

The customer is responsible for proper installation of the roof in accordance with the Erection Drawings and this Installation Guide, and in accordance with good engineering and construction practices.

The customer must take the responsibility for selecting a competent erector, insist that the work be performed by qualified and experienced standing seam metal roof installers, insist that the erector take time to study and understand this guide, then assure that the erector correctly follows the guide's instructions.

Alliance Steel, Inc. does not guarantee and is not liable for the quality of erection. *Alliance Steel, Inc.* is not responsible for building defects that may be attributed to improper erection or the negligence of other parties.

Clarification concerning the *Narrow Formed Seam 16* roof installation should be directed to the *Alliance Steel, Inc.* Customer Service Department.

Contact the *Alliance Steel, Inc.* office:

Alliance Steel, Inc.
3333 S. Council Road
Oklahoma City, OK 73179-4410
(405) 745-7500 or (800) 624-1579

1.3 Weather Tightness Warranty Requirements
(if applicable)

Depending upon the type of warranty, Alliance Steel, Inc. may require the roof installer to be certified by the manufacturer. Warranty requirements should be verified on contract with Alliance Steel, Inc.

Alliance Steel, Inc. shall approve in writing all roof penetrations prior to installation. This includes but is not limited to; Roof Curbs, Vent Pipes, & Mechanical Equipment. Submittals should be forwarded to Alliance Steel, Inc. for our review.

It is the customers responsibility to coordinate warranty inspections with the Alliance Steel Inc. warranty department.

Any special applications with regards to the weather tightness of this roof system should be brought to the attention of the warranty department at Alliance Steel, Inc.

2.0 SAFE ROOF INSTALLATION

2.1 Erector's Responsibility

The erector of the roof system is responsible for the safe execution of this Installation Guide. These instructions are intended to describe the sequence and proper placement of parts. They are not intended to prescribe comprehensive safety procedures.

If the erector cannot safely assemble the roof in accordance with these instructions, it is the responsibility of the erector to stop the work and contact *Alliance Steel, Inc.* to determine alternate assembly procedures.

2.2 OSHA

The Occupational Safety and Health Act (OSHA) has promulgated many regulations applicable to the installation of this or any other roof system. These regulations, identified as Part 1926, Safety and Health Regulations for Construction, are available from any government bookstore. The objective of the OSHA standards is to protect the worker from injury or illness. These OSHA regulations should be recognized as job site requirements and be fully complied with.

Failure to do so may result in substantial fines in the event of an OSHA inspection. Safe installation practices may be further defined and made mandatory by state or local ordinances.

Maintaining good housekeeping on the jobsite is recognized as being important to both OSHA compliance and to successful job completion.

2.3 Walking & Working on Roof Panels

A. PLACING PANELS ON THE STRUCTURE

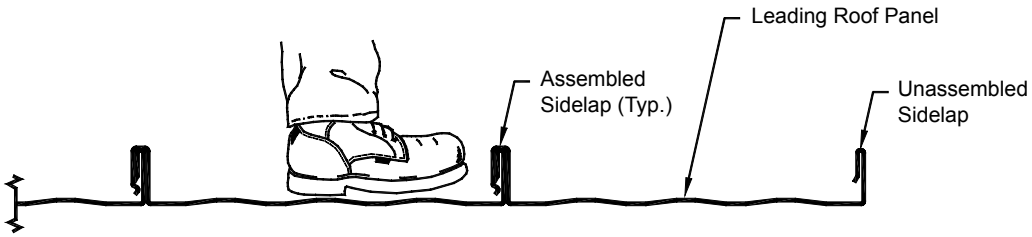
Do not place bundles of panels on the Roof Structure without first verifying the structure will safely support the concentrated weight of the panels and the weight of the installation crew. Some Roof Structures may not be designed to support the weight of a full panel bundle without additional structure support.

B. WALKING ON ROOF PANELS

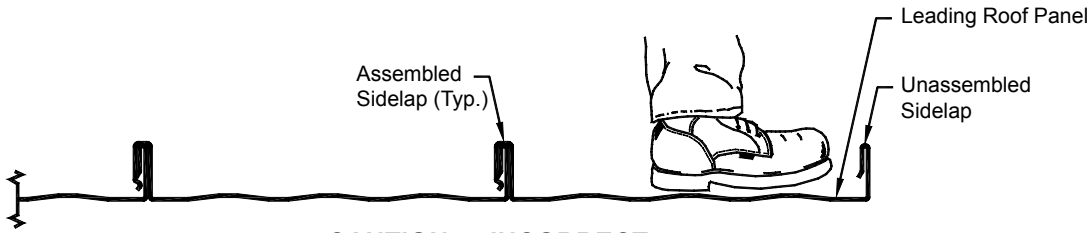
Do not use a Roof Panel as a working platform. An unsecured panel could collapse under the weight of a person standing between purlins or at the panel end.

Do not walk on the last installed panel run, as the unsecured edge could collapse under a person's weight. When installing clips or making endlap connections, etc., stand where the Roof Structural will support your weight.

An approved and safe walking platform should be used in high traffic areas to prevent the Roof Panel from being deformed, scratched, or scuffed.



CORRECT
Step **ONLY** on secured Roof Panels



CAUTION — INCORRECT
DO NOT step on leading (unsecured) Roof Panel.

2.0 SAFE ROOF INSTALLATION

2.3 Walking & Working on Roof Panels (Continued)

C. SAFETY EQUIPMENT
The use of safety equipment for the Roof Panel installation is recommended at all times during the installation process. However, when using lanyards, ensure that the clasp, belt hooks and wire cables are covered in such a manner that they will not scratch the panel surface if accidentally dragged along the panel.

D. CREW SIZE
The length of the individual Roof Panels should be considered when determining the crew size. It is recommended that under normal conditions, there be one person for every ten feet of panel length, plus one.

E. PANEL OVERHANG
Do not stand on the end of unsupported (cantilevered) panels at the eave or ridge. Standing on the cantilever portion may result in panel collapse.

F. POINT LOADS
When properly supported by the structurals, panels are designed to support uniform loads, which are evenly distributed over the panel surfaces. Point loads that occur in small or concentrated areas, such as heavy equipment, ladder or platform feet, etc., may cause panel deformation or even panel collapse.

G. SLICK SURFACES
Panel surfaces and structural steel surfaces are hard, smooth, and nonabsorbent, which causes these surfaces to be very slick when wet or covered with snow or ice. Even blowing sand or heavy dust can make these surfaces difficult to walk on without slipping.

Unpainted panel surfaces are often coated with oil to accommodate the panel-fabrication process. Although designed to wash away or evaporate during normal weather, the oil on new panels can be extremely slick, especially during periods of light rain or dew.

Caution must be exercised to prevent slipping and falling onto the roof surface or even sliding off the roof. Non-slip footwear is a necessity and non-slip working platforms are recommended.

H. ELECTRICAL CONDUCTANCE
Metal panels are excellent electrical conductors. A common cause of injury is the contact of metal panels with power lines during handling and installation. The location of all power lines must be noted and, if possible, flagged.The installation process must be routed to avoid accidental contact with all power lines and high voltage services and equipment. All tools and power cords must be properly insulated and grounded and the use of approved ground fault circuit breakers is recommended.

I. FALSE SECURITY OF INSULATION
Blanket and board insulation blocks the installer's view of the ground below the roof. Serious injury can occur when the installer gets a false sense of security because he cannot see the ground and steps through the insulation.

J. SHARP EDGES
Some edges of panels and trim are razor sharp and can cause severe cuts if proper protective hand gear is not worn. Be careful not to injure others while moving panels and trim.

2.4. Handling Roof Materials in Strong Winds

Do not attempt to move panels in strong winds. Wind pressure can easily cause a man to lose balance and fall. Strong wind uplift on a panel can lift the weight of the man carrying the panel.

Loose, wind borne panels are very dangerous and can cause severe injury and damage.

Secure stacks of panels with banding or tie-downs, so wind will not blow the panels off the roof. Clamp individual unsecured panels to the Roof Structurals. Clamp or block panel bundles and accessory crates to prevent them from sliding down the roof slope.

3.0 CHECKING THE STRUCTURE

3.1 Completed and Braced

Before placing materials and workers on the Roof Structure to start roof installation, it must be confirmed that the structure is designed to accommodate the material and erection loads as well as the appropriate live loads and wind uplift loads.

It also must be determined that the structure is complete and structurally sound with all structural connections and bracing in place and secure.

3.2 Lateral Stability

The sliding clip method of attaching the Roof Panels to the Roof Structurals provides only limited lateral stability and diaphragm bracing to the Roof Structurals.

Before placing materials on the roof and starting the roof installation, confirm that the necessary roof bracing and sag angles, strapping or bridging is in place and secured.

3.3 Alignment

Prior to installation, Roof Structurals should be checked for overall dimensions and evenness of plane. The Roof Structurals should also be checked to verify the roof system can be installed without interference. Also, Roof Structurals nearest the panel endlaps, ridge or high eave should be checked for correct location to properly accommodate the roof components.

A. TOLERANCES

To assure the roof system's correct fit-up and designed weather tightness, the structure must be aligned within the following tolerances:

Out of Square — The roof system can accommodate 1/8" of sawtooth of the Roof Panel ends at the eave, ridge and panel splices. This means the allowable out of square of the rake line relative to the eave line and ridge line is 1/2" for each 10' of rake run.

Structure Width and Eave Straightness — The roof system is designed to accommodate ±2" of overall structure width error, or ±1" of eave straightness error at each eave.

To assure that the accumulation of the structure width error and eave straightness error does not exceed the roof system's tolerance, the structure width should be measured from eave line to eave line at each rake, at the first frame line from each rake and at each point where there is a significant error or change in eave straightness (this usually occurs at a frame line or at a wind column).

Structure Length and Rake Straightness — The roof system is designed to accommodate ±2" of overall structure length error, or ±1" of rake straightness error at each rake.

Out of Plane — low spots/high spots should be no more than 1/4" in 20'-0". Measure ridge to eave then measure height to roof along the straight line of the roof plane.

To assure that the accumulation of structure length error and rake straightness error does not exceed the roof system's tolerance, the structure length should be measured from rake line to rake line at each eave, at the ridge and at each point where there is a significant error or change in rake straightness (this usually occurs at an end rafter splice).

B. MEASURING

Structure length and width may be measured with a steel Measuring Tape from the face of the eave or rake member to the face of the opposite eave or rake member. The Measuring Tape must be parallel to the relative eave or rake line and must be stretched taut.

Eave and rake straightness may be determined by measuring deviations from a string line, which is stretched taut along the eave or rake line.

C. AESTHETIC ACCEPTANCE

Although these structure alignment tolerances will allow for reasonable roof component fit-up and ease of installation, the extremes of these tolerances may be aesthetically objectionable and should be confirmed with the customer before starting the roof installation.

D. CORRECTIONS

Any structure alignment error, which exceeds the above stated tolerances, must be corrected before roof installation can begin. If it is decided that the structure alignment errors cannot be corrected, alternate roof details may have to be developed. The alternate details may require additional materials, modified parts (with additional cost, fabrication and delivery time) and additional installation time. *Alliance Steel, Inc.* cannot assure the performance of such alternate details.

4.0 RECEIVING & HANDLING ROOF MATERIALS

4.1 Material Inventory

Your material is carefully inspected and crated before leaving the plant and accepted by the transportation company as being complete and in satisfactory condition. It is the carrier's responsibility to deliver the shipment intact. It is the consignee's responsibility to inspect the shipment for damages and shortages when it is delivered.

Conducting a material inventory at the time of delivery is essential. By conducting the materials inventory, the erector is able to identify any material shortage or damage and avoid stopping installation later because of such shortage or damage.

It is imperative that any shortages or damage of the delivered materials be noted at once and clearly marked on the bill of lading before signature of acceptance. Notify *Alliance Steel, Inc.* immediately of any conflicts. *Alliance Steel, Inc.* will not be responsible for shortages or damages unless they are noted on the bill of lading.

In the case of packaged components (such as clips, fasteners and sealants, etc.), the quantities are marked on their container and should be checked against the bill of materials. ***Alliance Steel, Inc.*** **must be notified of any shortages or concealed damage within 15 days of delivery.**

4.2 Equipment For Unloading and Lifting

Hoisting equipment is necessary to unload and position the panels and accessory crates for site storage and installation. The equipment must have sufficient capacity and reach to place the material where it is required for efficient installation.

Slings will be required to minimize panel damage. The recommended slings are nylon straps of 6" minimum width and of sufficient length to accommodate the panel bundle girth.

A Spreader Bar will be required for the longer panel crates to assure correct sling spacing and uniform lifting. The Spreader Bar must be large enough to handle the maximum panel bundle weight and length.

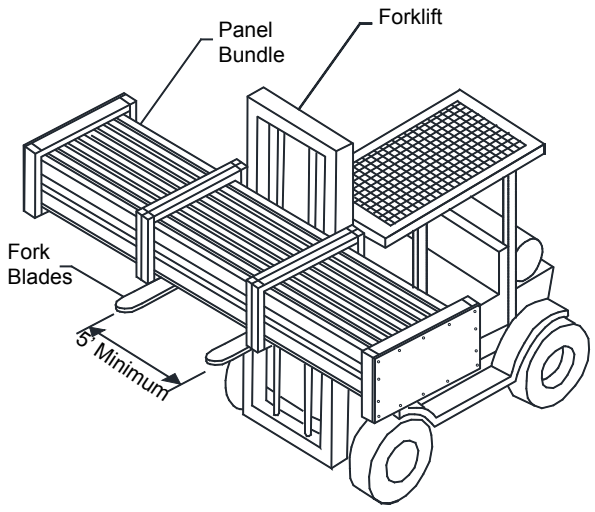
A Forklift is handy for unloading and placing shorter panel and accessory crates.

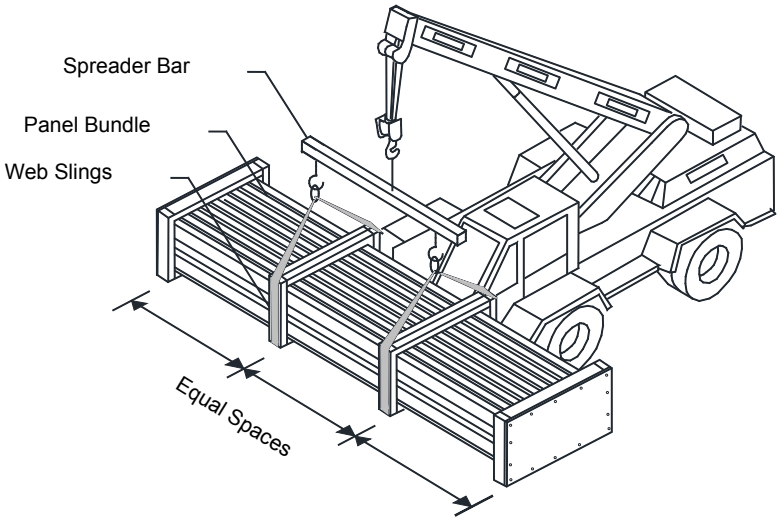
4.3 Lifting Roof Panel Bundles

Under normal conditions, panel crates less than 35' long can be lifted with two slings spaced at third points. Panel crates longer than 35' can be lifted with three or more slings located at quarter points using a Spreader Bar to achieve correct sling spacing for uniform lift.

Slings should be located under the cross boards. Loads should always be checked for secure hook-up, proper balance, and lift clearance. Tag lines should be used if necessary to control the load during lifting, especially if operating in the wind.

Panel crates less than 25' long may be lifted with a Forklift only if the forks are spread at least 5' apart and blocking is used to prevent panel damage by the forks.





4.0 RECEIVING & HANDLING ROOF MATERIALS

4.4 Field Storage of Roof Materials

Upon acceptance of the shipment, the customer or his representative is responsible for proper handling storage and security of the roof materials. *Alliance Steel, Inc.* is not liable for damage or loss of materials at the job site.

The Roof Panel bundles should be stored on the job site in accordance with the following recommendations:

a. Store panels in a protected area, out of standing water and drifting snow, etc.

b. Elevate panels with blocking to allow air circulation under the bundle.

c. Slope panels for drainage of moisture from the panels.

d. As necessary, cover panels with waterproof tarp, allowing for air circulation (do not wrap tarp under panel crate or restrict air movement).

e. Inspect panels daily for moisture accumulation.

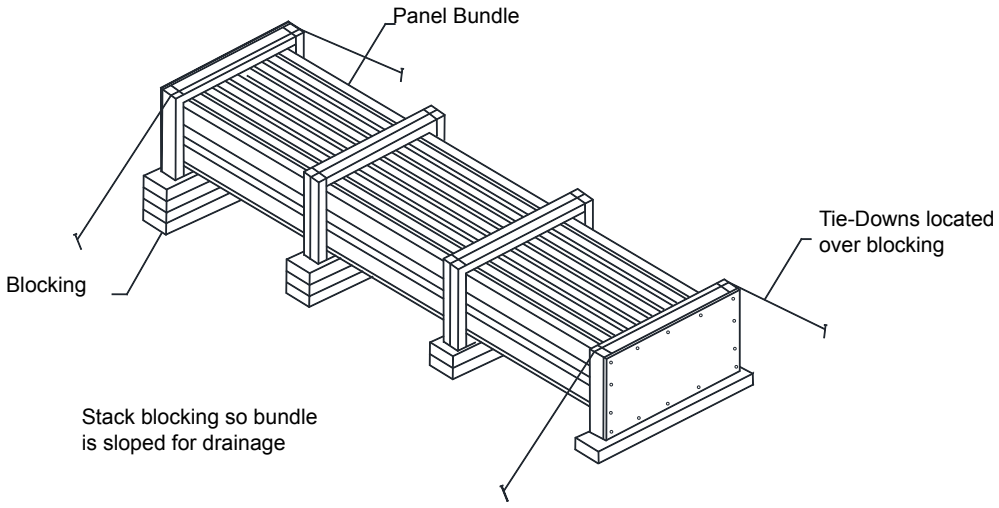
f. If panel bundles contain moisture, the panels should be dried and re-stacked. Use care in re-stacking to avoid damage to panels.

g. Opened or re-stacked panel bundles should be secured to prevent wind damage.

When moving panel bundles, extreme caution should be taken to prevent damage to the panel edges. Uncrated panels should be supported at each end and at 10' spaces.

All bundles or loose panels on the roof should be banded to the Roof Structurals at the end of each workday. On steep roofs, provisions should be taken to prevent panels and panel crates from sliding off the roof. Be sure to set panel bundles on the roof in the proper direction for the installation sequence.

Trim and accessories should be stored in a secure area and protected from damage, weather, and theft. Fasteners, sealants, closures, etc. should be stored out of the weather and protected from contamination.

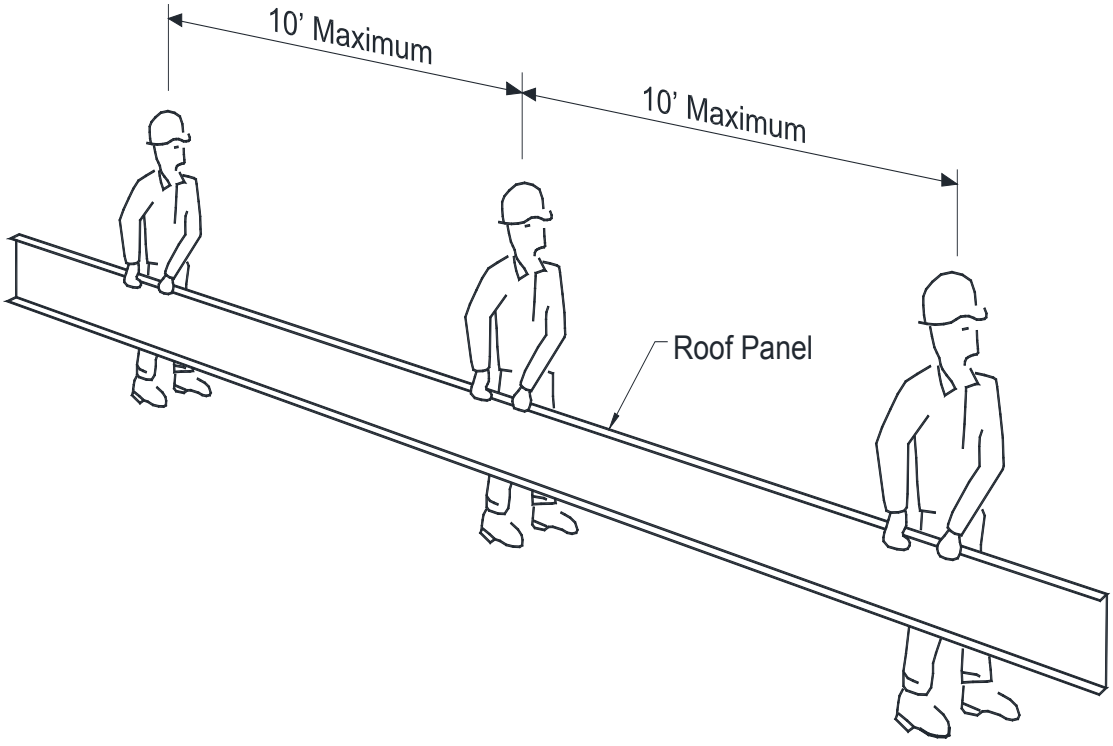


4.0 RECEIVING & HANDLING ROOF MATERIALS

4.5 Handling Individual Roof Panels

To lift individual panels, lift one side of the panel by the seam letting it hang naturally to prevent buckling. Pick-up points should not be more than 10' apart. Do not pick-up panels by the ends only, or in a flat position.

If the individual panels are to be lifted to the roof by hand line, the common method is to use the Vice Grip "C" clamps. Position the clamps on the flat of the panel as close as possible to one edge so the panel is lifted in a vertical position. The jaws of the Vice Grips must be padded to prevent damage to the panel surface. The clamps should be uniformly spaced, no more than 10' apart and the hand lines must be pulled in unison so that uneven lifting does not buckle the panel. Be sure the clamps are tight on the panel and the line is secure to prevent dropping the panel which can result in personal injury and property damage.



5.0 ROOF INSTALLATION BASICS

5.1 Proper Tools

Before starting paneling, be sure that the proper equipment and tools are on hand. The tools must be in good operating condition and operators should adhere to safety precautions at all times.

Improperly operating tools, too few tools, inadequate power source, or other equipment deficiencies slow down the installation process. The cost of inefficient working is usually greater than the cost of providing good equipment.

5.2 Equipment List

The following tools and equipment should be considered for efficient installation of the *Narrow Formed Seam 16* Roof Panel. Actual tools and equipment required may vary due to variations in building type and construction.

This list should not be interpreted as a limitation to your inventory of installation equipment.

Screw Guns — Designed for use with self-drilling screws
Socket Extensions — 6" extension for screw gun
Hex Socket Heads — 5/16" and 3/8", magnetic
Drill Motor — 1/4" capacity
Drill Bits — Assortment
Sheet Metal Cutter — or power shears or nibbler
"C" Clamps — vise grip, sheet meal type
Pop Rivet Tool — 1/8" capacity
Sheet Metal Shears — left and right cut
Steel Measuring Tape — 12', 50', 100'
Nylon String Line
Chalk Line
Brooms
Marking Pen — do NOT use lead/graphite pencils
Caulk Guns — for 1/10 gallon sealant tubes
Power Source and Extension Cords — capable of handling the total equipment requirements, including 20-amp seamer machine, without power drop due to extension cord length.

5.3 Sealants

A. TEMPERATURE EFFECTS

Temperature extremes must be considered during installation of the roof due to the sensitivity of sealants. The recommended installation temperature range is 20º to 120º F. At colder temperatures, the sealant stiffens resulting in loss of adhesion and compressibility. At hotter temperatures, the sealant becomes too soft for practical handling. On cold but sunny days, the panel's surface may become warm enough to accept the application of a heated sealant even though the air temperature is below 20º F.

When overnight temperatures fall below freezing, the sealant should be stored in a heated room so it will be warm enough to use the following day. On hot days, the sealant cartons should be stored off the roof in a cool and shaded area. While on the roof, sealant rolls should be kept shaded until actual use.

In very cold weather, it is recommended that the fasteners be tightened slowly and only tight enough that the sealant is in full contact with the panel or trim. Then on the next sunny day, complete the tightening process after the sun warms the panel and trim surfaces.

B. CONTAMINATION

To assure proper adhesion and sealing, the sealant must have complete contact with adjoining surfaces. Contaminants such as water, oil, dirt and dust prevent such contact. The panel and trim surfaces must be dry and thoroughly cleaned of all contaminants. Before applying Tape Sealant, the sealant should be checked for contaminants. If the sealant surfaces are contaminated, it must not be used.

During cool weather, condensation or light mist can accumulate on the panel and trim surface and not be easily noticed. It is recommended that sealants always be kept under protective cover and that the panel and trim surfaces be wiped dry immediately before installation.

Tape Sealant is provided with a protective paper to reduce contamination. Incomplete removal of the protective paper will prevent the sealant's adhesion to the panel or trim surfaces. Always check that the protective paper is completely removed. Do not remove the protective paper until immediately before the panel or trim is installed over the sealant.

5.0 ROOF INSTALLATION BASICS

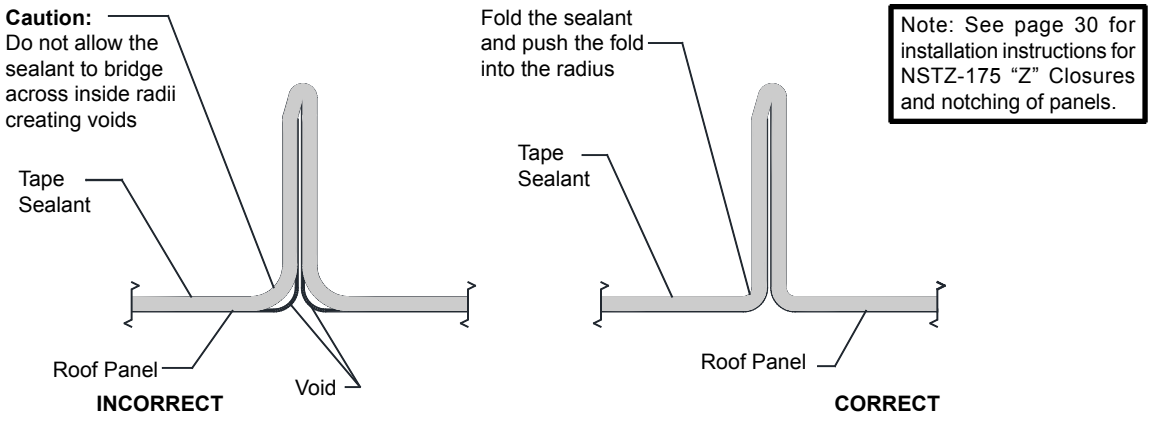
5.3 Sealants (Continued)

C. COMPRESSION
To assure proper adhesion and seal, the Tape Sealant must be compressed between the panel and trim surfaces with firm and uniform pressure. In most cases, the required pressure is applied by the clamping action of screws pulling the adjoining surfaces together. However, the Tape Sealant's resistance to pressure becomes greater in cold weather.

During cold weather, the fasteners must be tightened slowly to allow the sealant time to compress. If the fasteners are tightened too fast, the fastener may strip out before the sealant compresses adequately, or the panel or flash may deform in the immediate area of the fastener, leaving the rest of the sealant insufficiently compressed.

D. INSIDE CORNERS
An inside radius, such as where the panel flat meets a rib, is usually the most critical area to seal. A common mistake for the installer, is to bridge the sealant across the inside radius. When the lapping panel or trim is pushed into place, the bridged sealant is stretched and thinned. The sealant may then be too thin to adequately seal this critical area.

When Tape Sealant is applied at an inside radius, it is recommended that the sealant be folded back on itself, then push the sealant fold into the radius.



Note: See page 30 for installation instructions for NSTZ-175 "Z" Closures and notching of panels.

5.4 Fasteners

A. SCREW GUN
Use torque control Screw Guns for driving self-drilling screws. 2000-2500 RPM Screw Gun speeds are necessary to attain efficient drilling speeds. High tool amperage (4 to 7 AMP) is required to achieve the proper torque for secure fastening.

B. SOCKETS
Use good quality Sockets. Good fitting Sockets reduce wobble and stripping of the screw heads, especially the alloy and capped heads. They also minimize objectionable paint chipping and scuffing on colored screws and minimize damage to the protective coating on unpainted screws.

Magnetic Sockets collect drill shavings, which will build up and eventually prevent the Socket from seating properly on the screw heads. One method of removing the drill shavings is to roll up a ball of Tape Sealant and push the Socket into the sealant.

When the Socket is removed from the sealant, most of the drill shavings will remain embedded in the sealant thereby cleaning the Socket. This process should be repeated as often as needed to keep the Socket clear of drill shavings.

C. SOCKET EXTENSION
A 4" or 6" Socket Extension is recommended for installing the Panel Clip screws. With the extension, the screw can be driven straight down without tilting the screw gun to clear the panel or clip. Since Socket Extensions are slow to wear out, it is usually more cost effective to purchase Socket Extensions and good quality Sockets rather than purchase Sockets with built-in extensions.

D. INSTALLATION
Before starting the screw, the materials to be joined must be pressed together with foot or hand pressure. The pressure must be maintained until the screw has drilled through all the materials and the threads have engaged.

5.0 ROOF INSTALLATION BASICS

5.4 Fasteners (Continued)

Most self-drilling screws require 20 pounds of pressure to maintain the drilling action and to start the thread cutting action. Also, applying such pressure before starting the Screw Gun will usually prevent tip walking or wandering.

If too little pressure is applied, the drill point may not cut into the metal and the point will heat up and become dull. If the pressure is too heavy, the bottom material may be deflected away, causing a standoff condition, or the drill tip may be broken or split.

Screws must be held perpendicular to the panel or trim surface during starting and driving.

For proper seating of the fastener-sealing washer, the panel or trim surface must be clean and drill shavings must be removed from under washers before seating. The fastener must be driven perpendicular to the panel surface so that the washer can seat level without warping or cupping.

Do not over drive screws. Over driving can strip the threads and/or damage the sealing washer. Use Screw Gun with torque control set to function properly for the combination of fastener size, hole size and material thickness.

The fastener should be driven tight enough to uniformly compress the washer but not so tight that the washer splits or rolls out from under it's metal dome. The recommended procedure is to tighten the fastener until the sealing washer just starts to visually bulge from under the metal dome.

As a good installation practice, all roof installers should carry approved oversized screws. Upon stripping or breaking a screw, the screw must be immediately removed and replaced with the appropriate oversized screw. Do not defer the screw replacement to be remembered and fixed later, or to be found by the clean-up crew. The majority of such screws will be overlooked until the customer complains of leakage.

5.5 Field Cutting Panels and Trim

A. ABRASIVE SAW PROBLEMS

Abrasive Saws (circular saws with friction disks) are not recommended for cutting Roof Panels or trim. Abrasive Saws create high heat that may burn away the protective coating from the panel edge, causing the edge to rust.

Also, Abrasive Saw dust contains fine, hot steel particles, "swarf," which can melt into the paint finish or accumulate on the panel and trim surfaces where they can rust and cause staining and further rusting of those surfaces.

Topical rust caused by Abrasive Saw damage or abrasive dust particles may be excluded from warranty claims.

B. SHEARING METHODS

It is recommended that panels and trim be cut with Shears to provide a clean, undamaged cut. On shear cut edges, the protective coating extends to the edge of the cut and is often wiped over the edge to further protect the base metal.

Whenever possible, fit the material so that the factory cut edge is exposed and the field cut edge is covered.

When field cutting complex shapes, it is usually easier to cut out a 1" wide strip using both left and right hand Shears. The 1" cutout provides clearance to smoothly cut the flats and the clearance to work the Shears around tight corners.

When making repetitive cuts (such as cutting panels at a hip condition) it is recommended that a template be made from a piece of drop-off panel or trim to provide fast and accurate marking of the field cut. When using panel material for the template, cut off the top portion of the panel ribs so that the template is easily laid onto the panel being marked.

C. MARKING PANELS

Avoid marking the panels for cutting, etc., in a manner that will leave visible markings and stains, etc., on the finished roof surface. Use chalk or felt tip ink markers. **Do not use graphite (lead) pencils on unpainted panel surfaces,** the graphite can cause rusting of the surface.

6.0 ROOF PANEL LAYOUT

6.1 Sheeting Direction and Modularity

Although the *Narrow Formed Seam 16* Roof System is designed so it can be installed in either direction (left to right or right to left), there may be roof conditions which require a specific sheeting direction. Check the Erection Drawings to determine if a specific sheeting direction is required.

The recommended installation sequence is to complete each panel run from eave to ridge before starting the next panel run. This sequence will help ensure straight runs and allow the insulation to be installed immediately ahead of each panel run.

During installation of the roof, considerations must be made for maintaining panel square & plumb while holding the 16" increment exactly. By maintaining panel square & plumb, the Roof Panel sidelap and seam can be properly assembled, the proper roof coverage can be obtained and the standard perimeter parts will fit properly without necessity of field modifications or reordering of parts, etc.
Caution: Failure to maintain panel coverage width within the specified tolerance can cause faulty Roof Panel seams which can result in seaming difficulty or in severe cases reduction in roof performance specifications.

For proper fit-up between the panel, sealant and closures or endlap parts, the panels must be held to the width dimension of the panel, as designated on the Erection Drawings, within a 1/16" width tolerance per panel.

The accumulated coverage (start panel to finish panel) tolerance is determined by the ability to keep the panels parallel and to correctly fit and assemble the finish rake condition.

If the roof has conditions such as fixed location penetrations, parapets, fire walls, etc., the accumulated panel coverage may require tighter tolerances for proper fit-up and weather tightness of the roof system.

6.2 Layout & Checking for Coverage

Recommended for all roofs, but a must for large or complex roofs, is to make a layout of the actual structure (field measured as described in section 3.3) so that the Roof Panel start and stop dimensions can be laid out to accommodate any structural misalignments.

When the optimal start and finish dimensions are determined, a string line should be set to precisely determine a square & plumb leading edge of the start panel. After the start panel is secured and engaged with the next panel, the start panel seam will be the reference line for checking accumulated panel coverage.

Panel coverage is always checked at the eave, ridge, and end splices so that non-parallel seam (or dogleg) conditions can be detected and corrected before they become objectionable. The coverage check should be done with a Measuring Tape held taut and measured to the same side of the seam and always parallel to the eave to prevent any measuring error.

Every four to six panel runs should be checked for panel square, plumb, & modularity. This will assure that the panels are maintaining a straight line and proper coverage is being maintained. If the panels are off module, they should be corrected by equal adjustments of the next four to six panel runs.

6.3 Appearance Considerations

Although the above stated coverage tolerance will provide for reasonable ease of installation and water tightness, such visible conditions as non-parallel panel seams, dogleg of the panel seam at the end splices, non-parallel finish panel width, and mismatch of panel seams across the ridge, may be objectionable and should be confirmed with the customer before continuing roof installation.

7.0 INSPECTION OF ROOF ASSEMBLY DURING INSTALLATION

7.1 Importance of Inspection

During the roof installation, all areas of the roof system assembly must be frequently inspected to ensure the correct assembly in accordance with the Erection Drawings and this Installation Guide.

Failure to assemble the roof system correctly will result in roof performance problems that may require costly corrective work, roof replacement, and performance and damage claims etc. Also, incorrect installation may void the performance and material warranties.

7.2 Inspection List

A. ERECTION DRAWINGS
Check that the Erection Drawings are available at the job site and have been reviewed for difference with the actual job conditions and differences with the Installation Guide. Also, confirm that the drawings are the latest issue with the latest revisions and additions. Drawings will be labled Erection Set.

B. ROOF LAYOUTS
Check that the roof start and finish dimensions have been correctly determined based on the Erection Drawings and the actual structural conditions.

C. BEFORE INSTALLING ROOF PANELS
Check that the structural misalingments were corrected in accordance with Section 3.0 of this Installation Guide.

D. PANEL LENGTH
Check that the installed Roof Panels have the correct overhang at the eave and have the correct hold back at the ridge or high eave in accordance with the Erection Drawings.

E. EAVE SEAL
Check that the Tape Sealant is in the correct position on top of the Eave Trim. Check that the Roof Fasteners penetrate the center of the Tape Sealant and into the Eave Plate. Check that the fasteners are not loose or stripped.

Check that the Tape Sealant is in complete contact with the Roof Panel and Eave Trim without any voids or gaps. Confirm that the Roof Panel and Eave Trim are clean and dry during installation and that the sealant is not wet or otherwise contaminated.

F. RIDGE SEAL
Check that the Zee Closures are correctly assembled.

Check that the sealant is in the correct position and is in complete contact with the Zee Closure and the Roof Panel without any voids or gaps. Confirm that the Zee Closures and Roof Panels are clean and dry during installation and the sealant is not wet or contaminated.

Check that the Zee Closure fasteners penetrate through the center of the sealant and into the Back-Up Channel or plate. Check that the fasteners are not loose or stripped.

Check that the Tube Sealant is installed along the back of the Zee Closure as necessary to seal any voids around the panel seam area.

G. RAKE SEAL
Check that the Termination Zee is correctly assembled with the splices correctly oriented for downhill watershed.

Check that the sealant is in the correct position above the Roof Panel.

At Fixed Rake:
Check that the Termination Zee sets fully on the sealant and that the sealant is in complete contact with the Roof Panel and the zee without any voids or gaps. Confirm that the Roof Panel and zee are clean and dry during installation and that the sealant was not wet or contaminated.

Check that the Termination Zee fasteners (Roof Fasteners) penetrate the center of the sealant and into the Substrate. Check that the fasteners are not loose or stripped.

7.0 INSPECTION OF ROOF ASSEMBLY DURING INSTALLATION

7.2 Inspection List (Continued)

H. PANEL CLIP ATTACHMENT

Check that the Panel Clips are correctly and tightly fitted to the panel without any distortion or damage of the clip and that the clips are level, 90º to substrate.

Check that the clips are located along each panel sidelap at each Roof Structural or at the locations specified on the Erection Drawings.

Check that the Panel Clip Fasteners are of the type, size, length, finish and quantity-per-clip as specified on the Erection Drawings.

Check that the Panel Clip Fasteners are not loose or stripped. In the case of multi-layered construction, verify that the fasteners penetrated and engaged the specified structural member.

I. SIDELAP

Check that the panel sidelaps are on module (held within a 1/16" panel width tolerance) and are assembled so that the male and female panel edges and Panel Clips are properly nested together.

Check that the full length of each sidelap seam is correctly engaged from lowside to highside of panel length.

Check that the factory installed sidelap sealant is in the correct position without voids or interruptions and is not damaged, wet or otherwise contaminated.

Check that the accumulated coverage will allow proper fit and assembly of the Zee Closures and finish rake condition and any other critical fit conditions such as penetrations, parapets, etc.

J. TRIM AND PENETRATIONS

Check that all trim (including penetrations) are correctly assembled and tightly fitted. Check that the required sealants are correctly positioned and in complete contact with the adjoining surfaces without voids or interruptions. Confirm that the sealants and adjoining surfaces are clean and dry during installation.

Check that the trim splices are correctly lapped, sealed and fastened.

Check that the trim is sufficiently pitched to shed water and eliminate ponding areas, especially at the critical splices, endlaps and corners.

Check that the fasteners are of the specified type, size, length, finish and spacing. Check that the fasteners are not loose or stripped. Check that the sealing washers are in full contact with the trim surface and not distorted, split or otherwise damaged.

Along the rakes, high eave transitions, fixed penetrations, etc., check that the trim is not constrained and will allow for the roof's expansion/contraction movement.

K. SURFACE CONDITIONS

Damaged roof system surfaces are subject to corrosion and performance problems and may void the material and performance warranties.

Check that the panel and trim surfaces are not being subjected to abusive conditions such as careless handling of panels and trim, excessive roof traffic, abrasive or contaminated footwear, rough handling of materials, tools and equipment, contact with abrasive materials or residue, etc.

Check that the panel and trim surfaces are not being subjected to exposed metal objects and materials left on the roof such as tools, material drop-off, fasteners, wire, staples, drill and nibbler chips, saw and file particles, etc. In the process of rusting, these materials will absorb the panel's protective coating thus leaving the panels exposed to rusting.

Check that the panels and trim are not being subjected to long term wet conditions such as standing water, consistent sources of steam, mist, spray, dripping or runoff, wet debris, wet insulation or other moisture holding material.

Check that the panels and trim are not subjected to direct contact or runoff from corrosive materials such as copper, lead, or cast iron pipes and trim, uncured cement, treated lumber anti-icing chemicals, strong solvents or other corrosive materials.

Check that Graphite Pencils were not used to mark on unpainted surfaces. The graphite marks can cause rusting.

Check that the roof materials are not subjected to damaging heat such as Cutting Torches, Abrasive Saws, etc.

7.0 INSPECTION OF ROOF ASSEMBLY DURING INSTALLATION

7.2 Inspection List (Continued)

L. UNSPECIFIED MATERIALS

Use of the wrong materials may cause installation and performance problems and may void the performance and material warranties.

Check that all installed roof system materials, especially sealants and fasteners, are only those which are provided or specified by *Alliance Steel, Inc.* for your specific project and are used only as specified on the Erection Drawings and this Installation Guide.

Alliance Steel, Inc. cannot be responsible for the performance of roof materials that are not provided, specified or approved by *Alliance Steel, Inc.*

M. WARRANTY CONSIDERATIONS

If *Alliance Steel, Inc.* is to provide a weather tightness warranty for your project *Alliance Steel, Inc.* requires that:

1. *Alliance Steel, Inc* must be notified prior to the contract being written.
2. Shop drawings must be submitted and approved.
3. Field inspection is required.
4. The Roof Curbs must be pre-approved by *Alliance Steel, Inc.*

All Roof Curbs must be compatible with the Roof Panel. The Roof Curbs should have male and female side ribs and water diverters at the upslope side of the Roof Curb. Contact *Alliance Steel, Inc.* for approved Roof Curb manufacturers. **Roof Curb must be welded .080 Aluminum Metal. No Weather Tightness Warranty will be issued "after the fact" post installation**

All Pipe Penetration Covers must have sealant (by others) between the top of the Rubber Boot and Vent Pipe. Secure boot to pipe with Stainless Steel Draw Band (by others).

8.0 STANDARD PARTS

8.1 General

The following details provide a basic description and graphic illustrations of the standard roof assembly parts. The purpose of these details is to assist the erector in the correct selection and identification of parts.

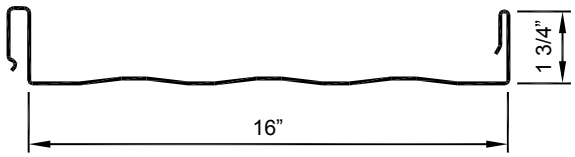
Because of the many variations in conditions, it is important that you review the job conditions to identify the specific parts required for your job.

Review the Erection Drawings for any special parts or parts which are different from the standard parts shown in these details. **If differences exist, the Erection Drawings will have preference.**

For proper fit-up, sealing and fastening, and to help ensure the roof assembly's weathertightness, structural capability, durability and appearance, the correct parts must be used. **Do not use parts other than those specified on the Erection Drawings.**

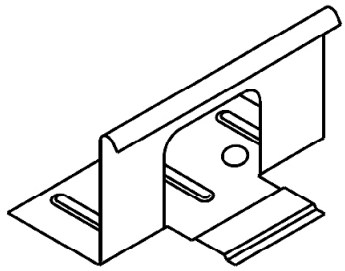
8.0 STANDARD PARTS

ROOF PANEL (16" wide panel)
- 22 or 24 gauge Steel
- Painted or Galvalume Finish
- Striated



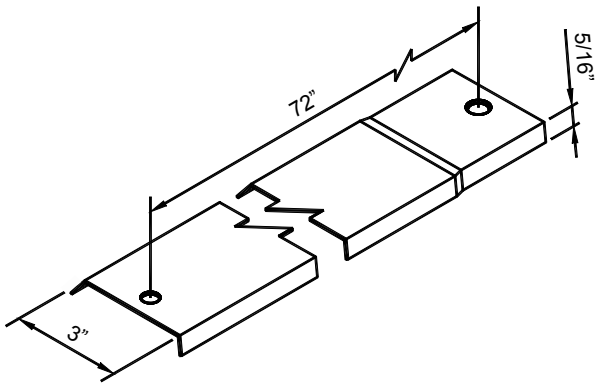
Part No. NFS-16
(Specify finish & length)

CLIP, UL 90
- Panel Clip
- Galvanized Steel



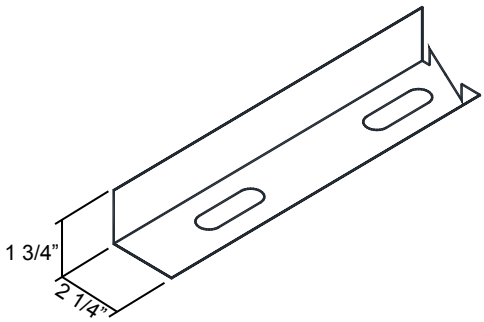
Part No. NFS-90

BACK-UP CHANNEL
- 16 gauge Galvanized Steel



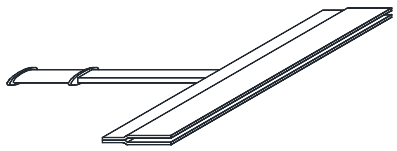
Part No. BP-172

FLOATING RAKE SUPPORT
- 10' Length
- 14-Gauge Red Oxide
- Factory Slots



Part No. NFS-RS

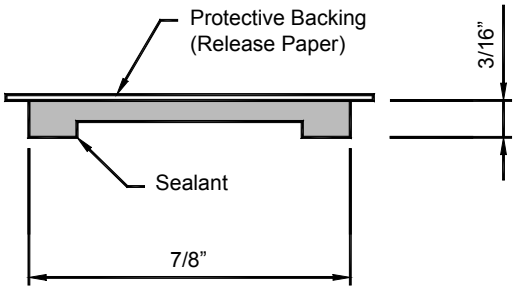
PANEL HEMMING TOOL



Part No. NFS-HT

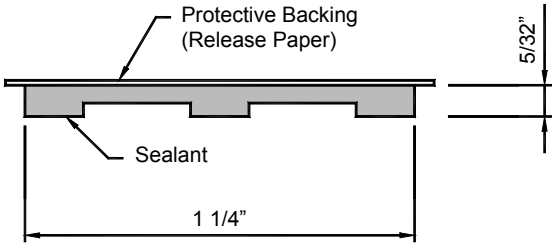
8.0 STANDARD PARTS

Tape Sealant
- 3/16" x 7/8" Butyl Tape Sealant
- 40' roll
- For use at Eave and Ridge



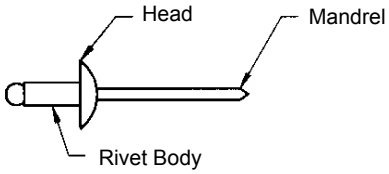
Part No. LS-100

TRIPLE BEAD Tape Sealant
- 5/32" x 1 1/4" Butyl Tape Sealant
- 30' roll
- For use at valleys with through Fasteners



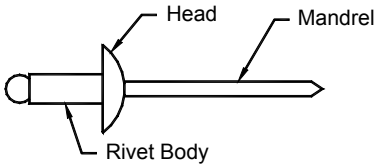
Part No. LS-200

BLIND RIVET (for Trim joints)
- Aluminum
- 1/8" dia. x 3/16" length



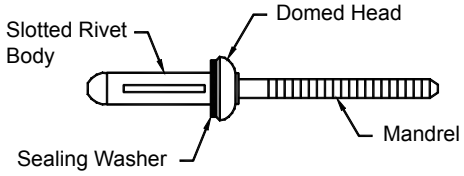
Part No. BR1

POP RIVET (for use into panel & back-up plate w/ board or hip/valley plate)
- Steel
- 3/16" dia. x 3/8" length



Part No. PR1

BULB-TITE RIVET
(for Ridge Row splice attachment)
- Aluminum
- EPDM Sealing Washer
- 3/16" dia. x 7/8" Length



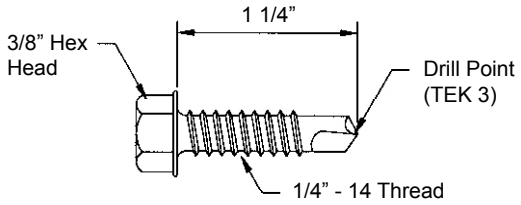
Part No. BT1

CLIP FASTENER
(2 x 4 x 16 GA. Angle attachment to structual steel)
- #12 - 24 x 1 1/2" #30 Torx Head Screw
- Corrosion resistant plating

Part No. CF4

8.0 STANDARD PARTS

PANEL CLIP FASTENER
(for Panel Clip attachment to Steel Purlins)
- 1/4" - 14 x 1 1/4", hex head, Self Drilling Screw
- Corrosion resistant plating

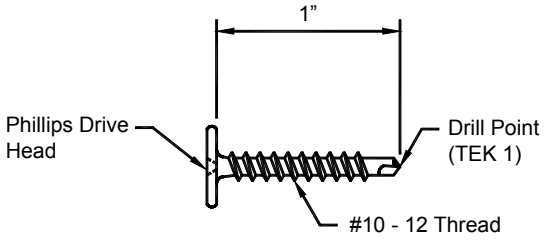


Part No. CS75

ROOF FASTENER
(for Panel Edge attachment)
- 1/4" - 14 x 1", ZAC, Self Drilling Screw
- Eave attachment over Plywood
- Painted or mill finished head

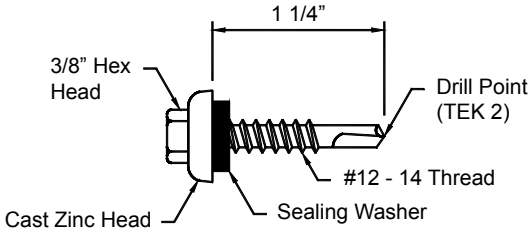
Part No. RF4

CLIP FASTENER
(for Panel Clip and offset cleat attachment to Metal Decking, Eave Strut, or Purlins)
- #10 - 12 x 1" Phillips drive, Pan Head Screw
- Corrosion resistant plating



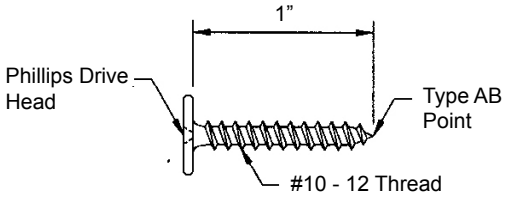
Part No. CF2

ROOF FASTENER
(for Panel attachment)
- #12 - 14 x 1 1/4" ZAC, Self Drilling Screw
- EPDM Sealing Washer
- Corrosion resistant coating or alloy head
- Painted or mill finished head



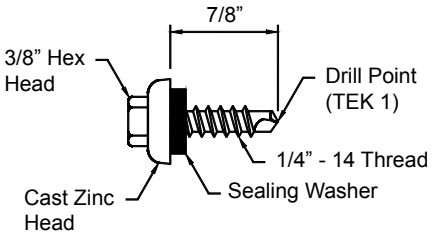
Part No. RF2
(Specify finish)

CLIP FASTENER
(for Panel Clip attachment to Wood Decking)
- #10 - 12, Phillips drive, Pan Head Screw
- Corrosion resistant plating



Part No. CF3
(Specify length)

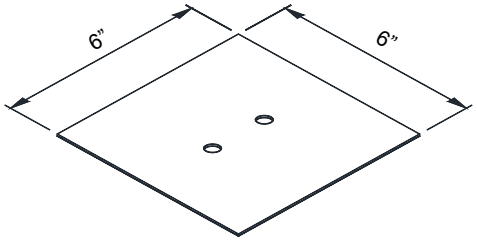
TRIM FASTENER
(for Trim attachment)
- 1/4" - 14 x 7/8" ZAC, Self Drilling Screw
- EPDM Sealing Washer
- Corrosion resistant coating or alloy head
- Painted or mill finished head



Part No. RF3
(Specify finish)

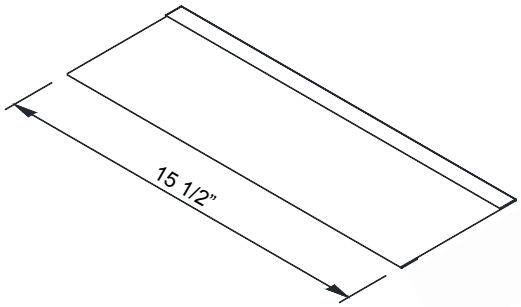
8.0 STANDARD PARTS

BEARING PLATE STANDARD
- 16-Gauge Red Oxide
- For use with Rigidboard Insulation



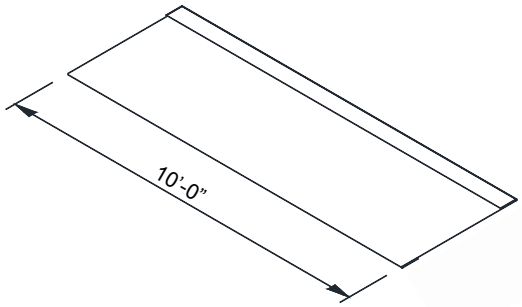
Part No. SSBP

BACK-UP PLATE
- For use at floating high eave & ridge @ board/wood.
- 22 gauge galv



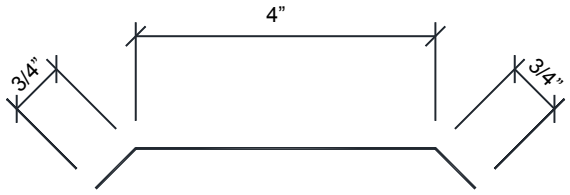
Part No. NST-97

BACK-UP PLATE
- For use at hip @ board/wood.
- 22 gauge galv



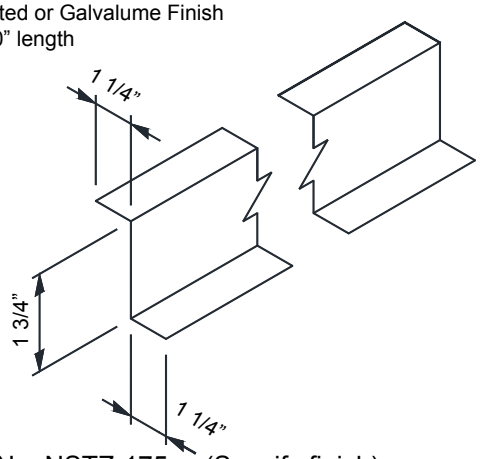
Part No. NST-97H

PINCH BAR
(Over Purlin @ Insulation)
- 24 gauge galv.



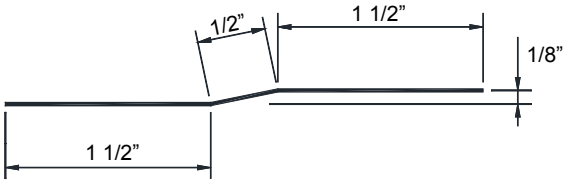
Part No. NST-99

ZEE CLOSURE
- 24 gauge Steel
- Painted or Galvalume Finish
- 10'-0" length



Part No. NSTZ-175 (Specify finish)

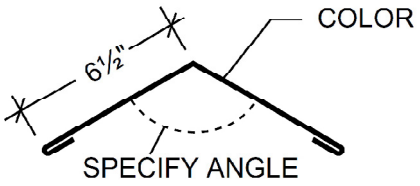
OFFSET CLEAT
- 22 gauge Steel
- 10'-0" Length
- Galvalume Finish



Part No. NST-98

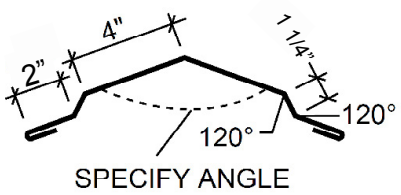
8.0 STANDARD PARTS

RIDGE/HIP FLASH, FIXED



Part No. NST-33 (Specify Roof Pitch)

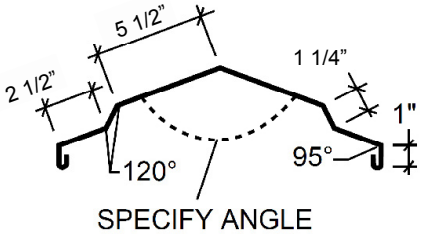
RIDGE/HIP FLASH, FLOATING



Part No. NST-34 (Specify Roof Pitch)

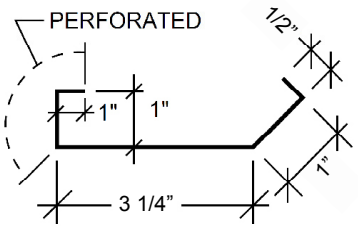
RIDGE/HIP FLASH FOR VENT

- For use with vent material



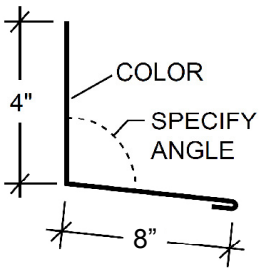
Part No. NST-34V (Specify Roof Pitch)

PERFORATED VENT DRIP



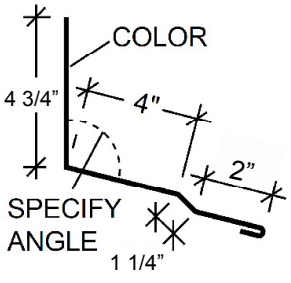
Part No. NFS-PV1

HIGH EAVE TO WALL FLASH-FIXED



Part No. NST-62

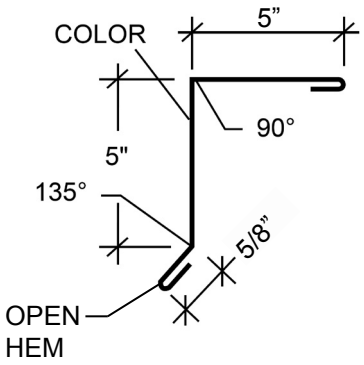
HIGH EAVE TO WALL FLASH-FLOATING



Part No. NST-63

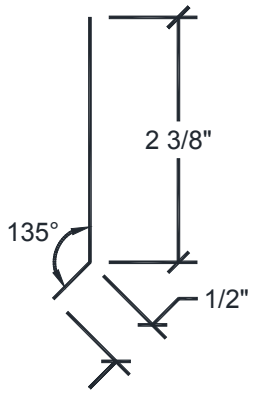
8.0 STANDARD PARTS

BOX RAKE TRIM



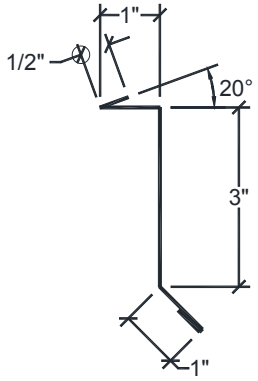
Part No. NST-28

CONTINUOUS CLEAT



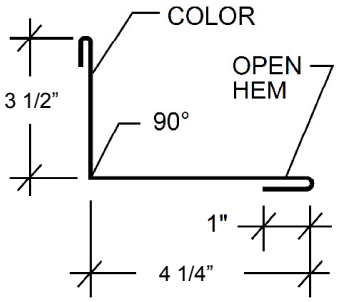
Part No. NST-4

COUNTERFLASH



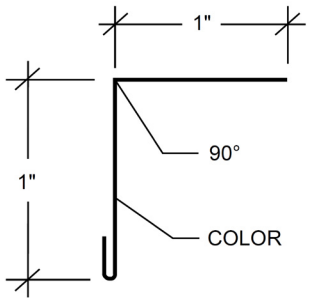
Part No. NST-40

RAKE TO WALL FLASH



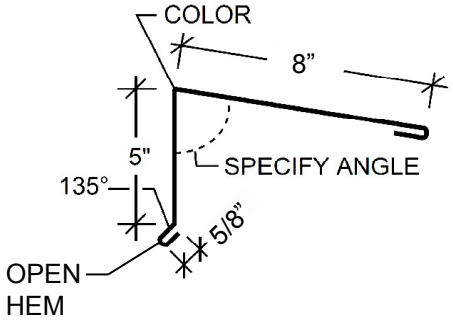
Part No. NST-61

RAKE CLEAT



Part No. NST-96

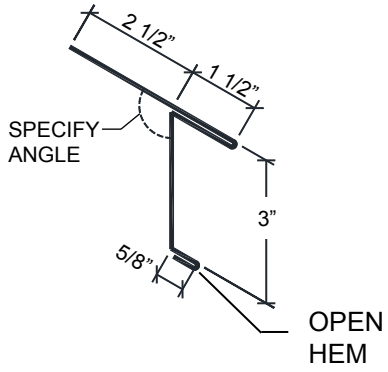
HIGH EAVE PEAK TRIM



Part No. NST-16

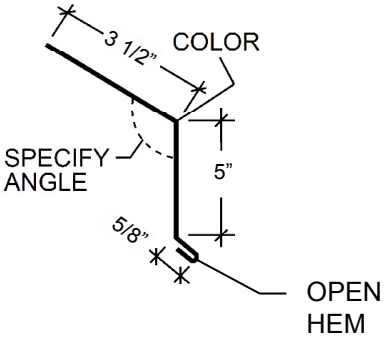
8.0 STANDARD PARTS

EAVE TRIM WITH DRIP EDGE



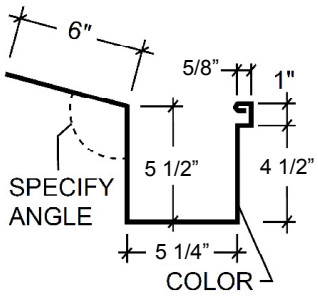
Part No. NST-17EX

EAVE TRIM



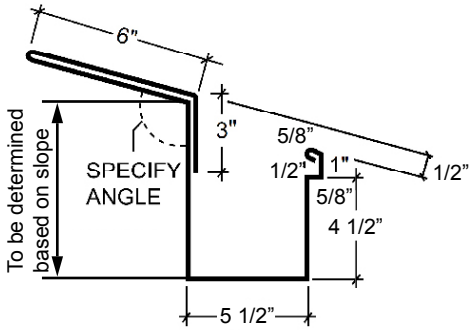
Part No. NST-17

BOX GUTTER TRIM



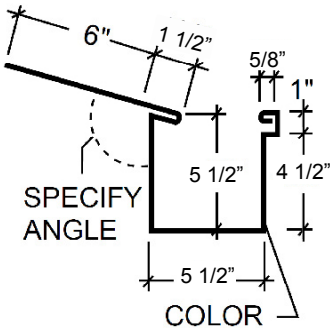
Part No. NST-9

SNOW GUTTER



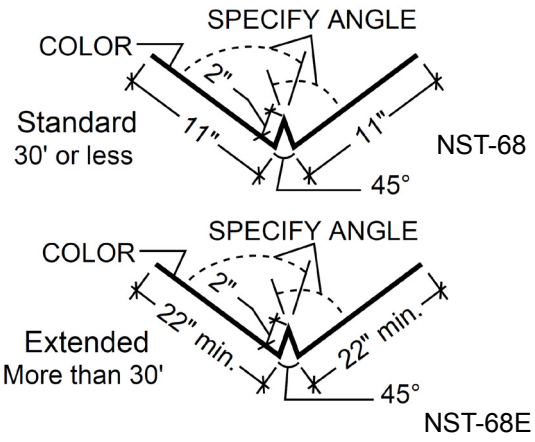
Part No. NST-9SG

BOX GUTTER WITH DRIP EDGE



Part No. NST-9EX

VALLEY TRIM



(Specify Roof Pitch)

9.0 ROOF INSTALLATION DETAILS

9.1 PREPARATORY AND DESIGN REQUIREMENTS

1. A single pitch eave strut must be used with the **Narrow Formed Seam 16** Roof System.
2. Make sure a Rake Angle has been installed on top of the purlins to accept the Floating Rake Support or “Z” Closure over panel at the rake. See figure 1.
3. The wall panels do not have to be installed before the roof is installed. However, for the purpose of this manual, we have assumed that the wall panels have been installed.
4. The substructure (eave to ridge) must be on plane tolerance of 1/4” in 20’ and 3/8” in 40’.
5. It is critical that the purlins or bar joists at the ridge 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 to foul as the panels expand and contract.
6. Peak Purlin Spacing: 1’-0” from center line of ridge to web of purlin. See figure 2.
7. All **Narrow Formed Seam 16 (NFS-16)** Roof Panels are 16” wide with striations.
8. Maximum panel length is 55’-0”.
9. Use of NFS-16 Panel with insulation that is sandwiched between the panel and purlin requires the use of a pinch bar prior to panel clip installation. See Figure 3

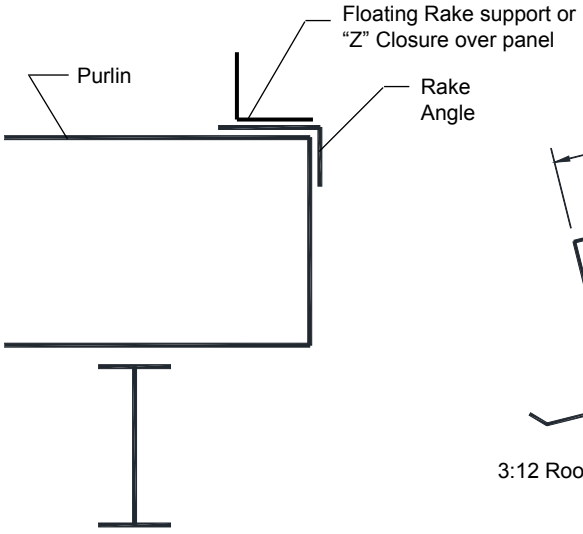


Figure 1

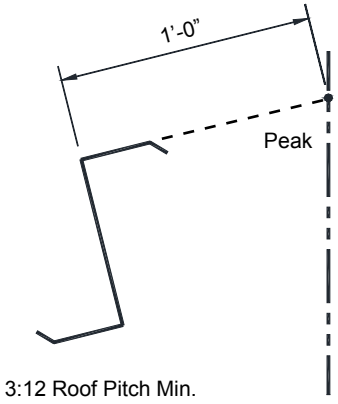


Figure 2

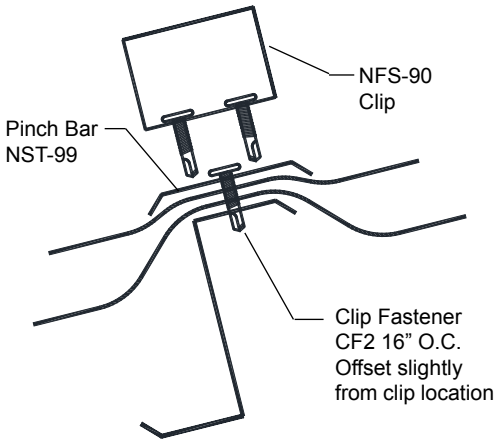


Figure 3

CAUTION

Diaphragm capabilities and purlin stability are not provided by ASI’s **Narrow Formed Seam 16** Roof System. Therefore, other bracing may be required to conform to A.I.S.C. or A.I.S.I. specifications.

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.

9.0 ROOF INSTALLATION DETAILS

9.2 GENERAL

The following details provide graphic illustration of the roof assembly steps. The purpose is to instruct the erection crew in correct and efficient assembly of the roof system.

Because of the many variations in conditions, it is important that you review the job to identify and isolate the specific installation details required for your job.

Review the Erection Drawings for differences with these details. If differences exist, the Erection Drawings have precedence.

These details are arranged in a step-by-step sequence. Following this sequence ensures correct assembly and ensures that the part to be worked on will be readily accessible for the next assembly step.

Do not shortcut these assembly steps without careful consideration of the possibility of incorrect or omitted assembly and the resulting corrective rework.

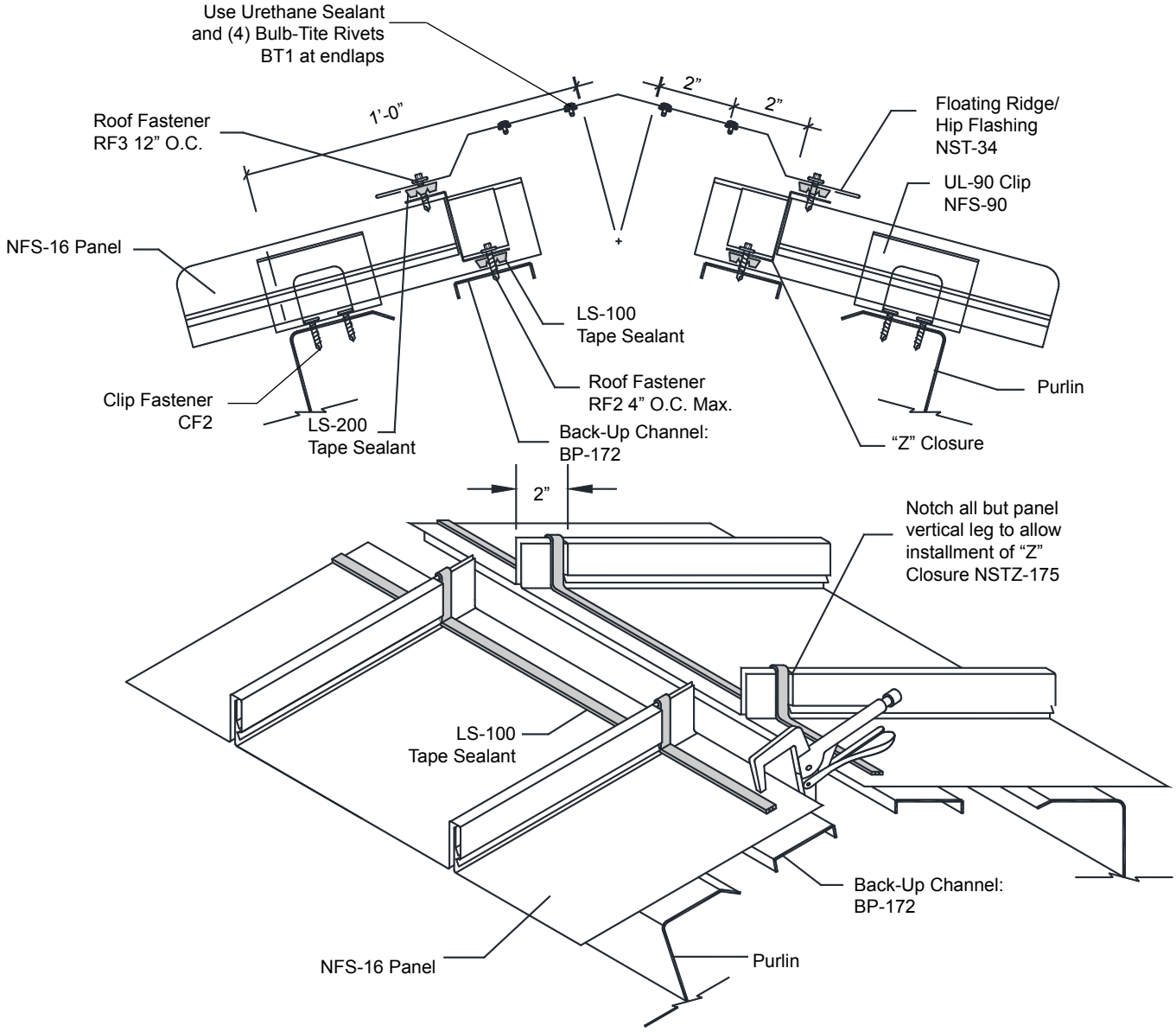
To minimize confusion, the details are always oriented so that the view is from eave to ridge, with the starting rake at the left and finish rake at the right. Refer to the Erection Drawings to determine the required sheeting direction and rake conditions.

To help ensure weathertightness, the details emphasize proper fit-up, sealing and fastening. It is most important that only the specified sealants and fasteners be used for each condition and that they be installed correctly as shown on these details and the Erection Drawings.

Be sure that these critical instructions are reviewed often and the roof assembly is checked at each assembly step.

9.3 RIDGE CAP DETAILS

TYPICAL DETAILS
FLOATING RIDGE @ PURLINS
(4'-0" MAX SPACING)

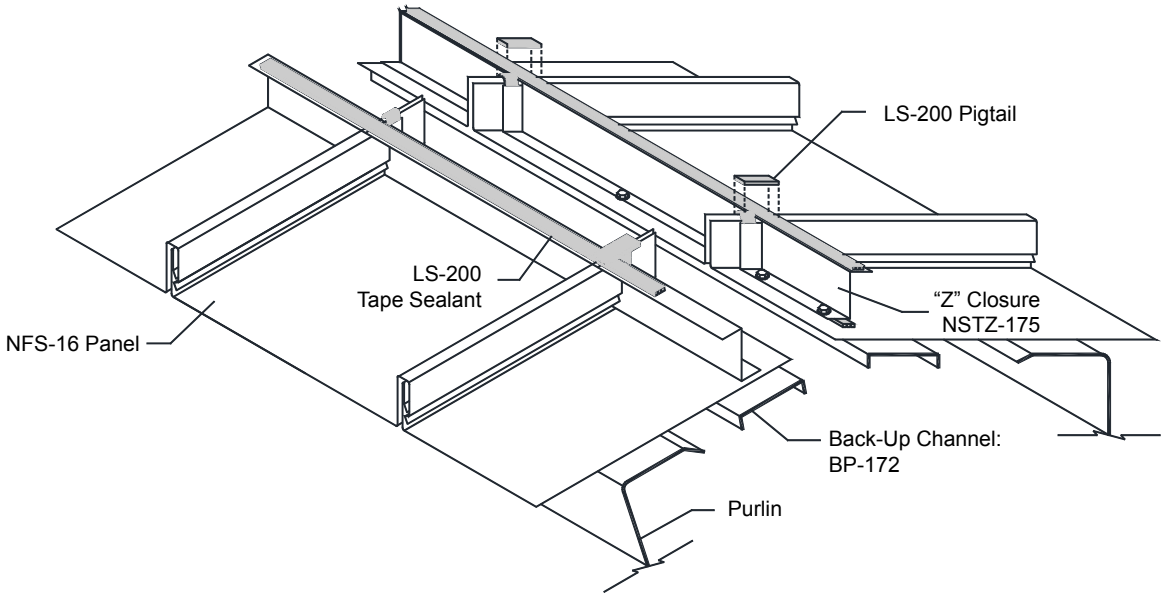


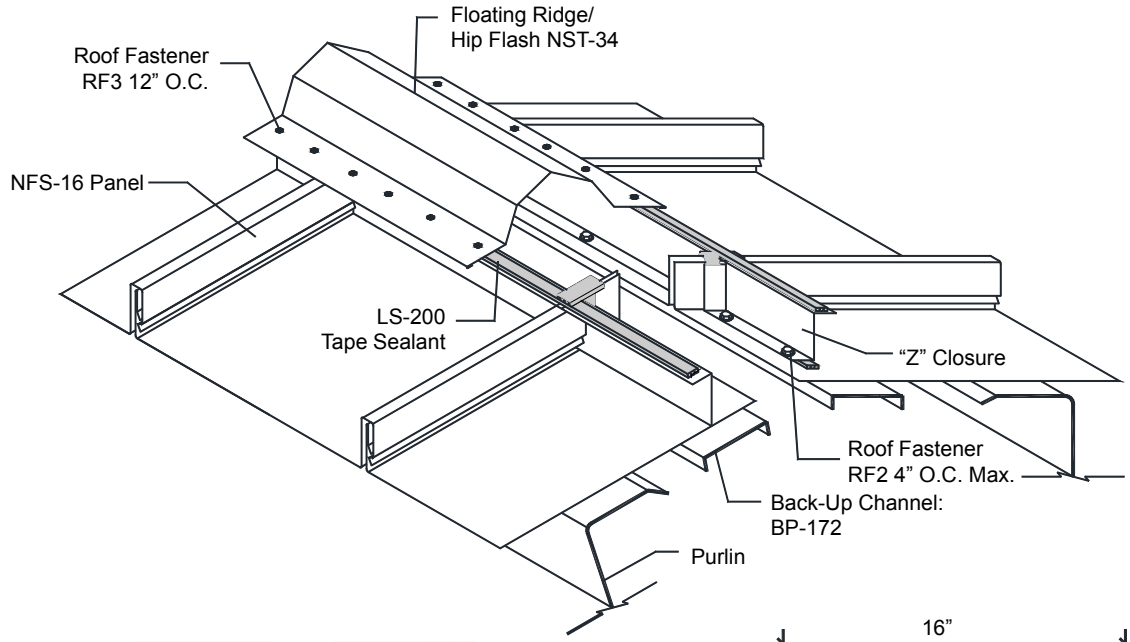
NOTES:

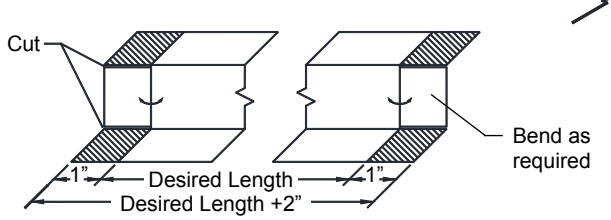
1. **Do not use a floating ridge detail with the offset cleat method of attachment at the eave or valley.**
2. Peak purlin spacing for fixed ridge is 1'-0" from the centerline of ridge to web of purlin.
3. Notch panel ribs for "Z" Closure leaving primary rib vertical.
4. The upslope end of the panel is 2" from the peak.
5. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
6. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
7. Install "Z" Closures to panel & back-up channel with Roof Fastener RF2 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel.
8. Seal end of "Z" Closure to panel seam with Urethane Sealant.
9. Attach Ridge Flash to "Z" Closure with Roof Fastener RF3 at 12" O.C.
10. Ridge/hip flashing must have urethane sealant at all endlap conditions. Use BT-1 Bulb-Tite Rivets.

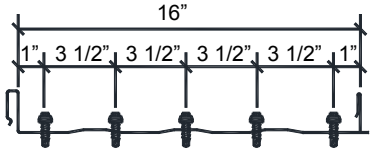
9.3 RIDGE CAP DETAILS

TYPICAL DETAILS
FLOATING RIDGE @ PURLINS
(4'-0" MAX SPACING)





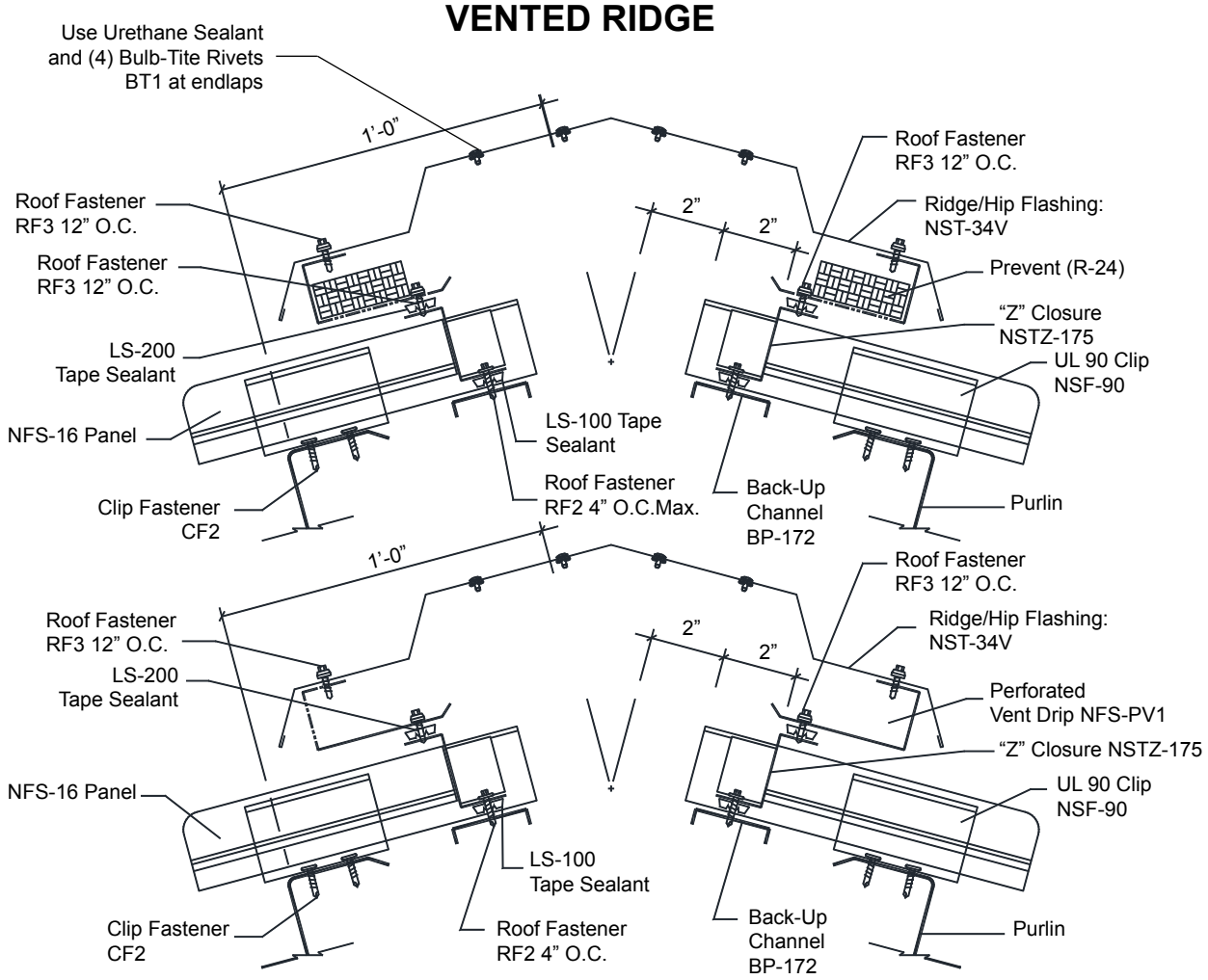




FIELD WORK ZEE CLOSURE

9.3 RIDGE CAP DETAILS

TYPICAL DETAILS
VENTED RIDGE



NOTES:

Ridge With Metal Vent Conditions

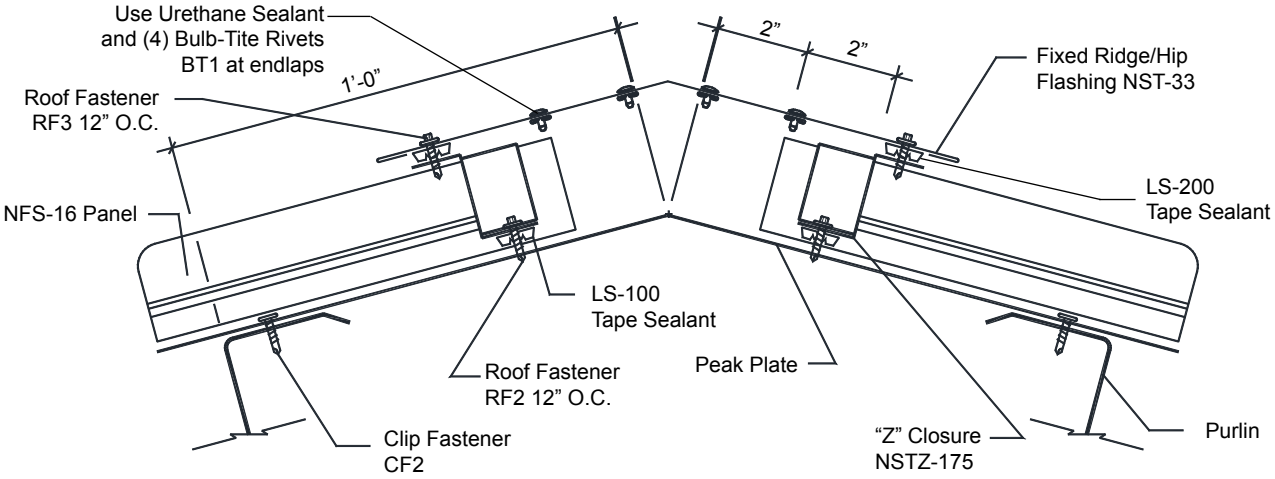
1. **Do not use a floating ridge detail with the offset cleat method of attachment at the eave or valley.**
2. Notch panel ribs for "Z" Closure leaving primary rib vertical.
2. Install Back-Up Channel onto end of panel.
3. Field cut "Z" Closures to fit panel width. Cut & form 1" tab at each end to sit on Tape Sealant. See page 30.
4. Install Tape Sealant (LS-100) to panels. The center of Tape Sealant should be 1 1/2" from end of panel.
5. Install "Z" Closures to panels & back-up channel with Roof Fastener RF2 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel.
6. Install LS-200 Tape Sealant to top of "Z" Closure.
7. Install vented metal to "Z" Closures with Trim Fastener RF3 at 12" O.C.
8. Attach ridge flash with Trim Fastener RF3 at 12" O.C. to vented metal.
9. Vented ridge detail should be used in conjunction with soffit and/or eave vents to provide proper circulation and to prevent weather infiltration during high winds.
11. Ridge/hip flashing must have urethane sealant at all endlap conditions. Use BT-1 Bulb-Tite Rivets.

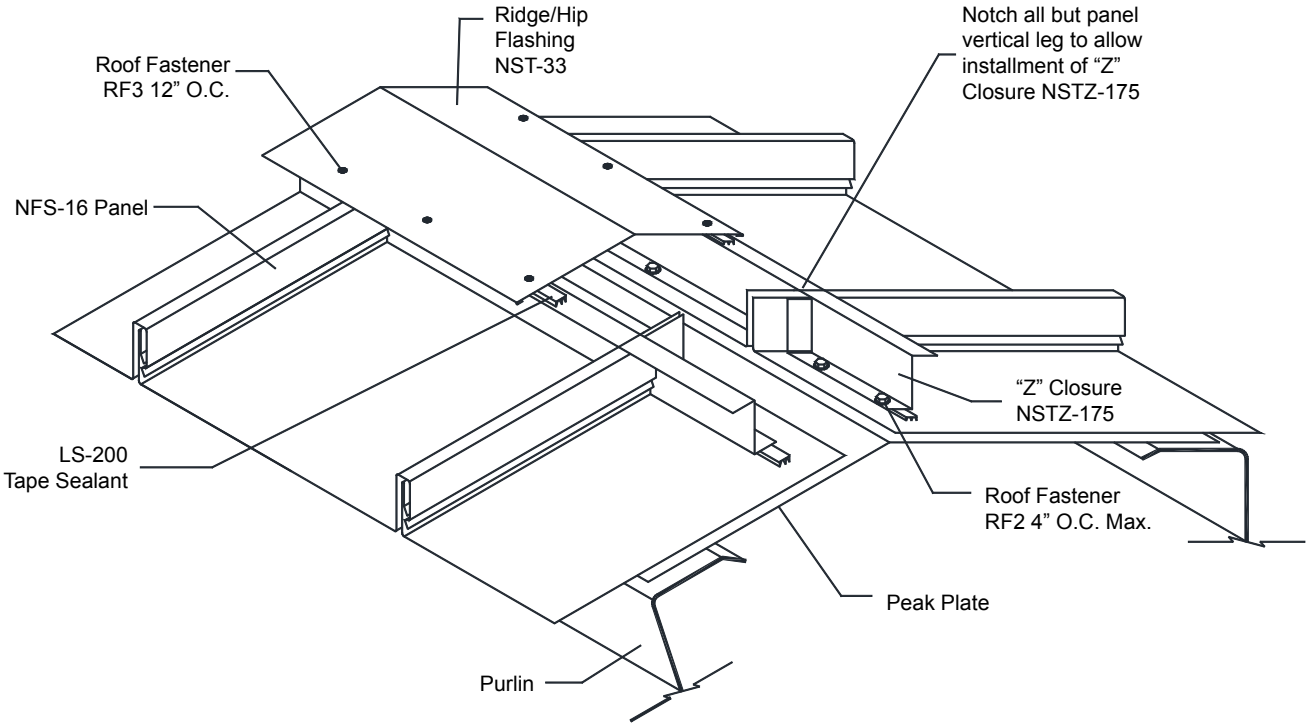
Ridge With perforated Vent Drip Conditions

1. **Do not use a floating ridge detail with the offset cleat method of attachment at the eave or valley.**
2. Vented ridge detail should be used in conjunction with soffit and/or eave vents to provide proper circulation and to prevent weather infiltration during high winds.
3. Notch panel ribs for "Z" Closure leaving primary rib vertical.
3. Install Back-Up Channel and "Z" Closure as in Notes 2-6 above.
4. Attach vent drip to "Z" Closures with Trim Fastener RF3 at 12" O.C. Seal laps in vent drip with Urethane Sealant.
5. Attach Ridge Flash to vent drip with Trim Fastener RF3 at 12" O.C.
6. **Metal vent material must have urethane sealant at all trim lap conditions.**
8. Ridge/hip flashing must have urethane sealant at all endlap conditions. Use BT-1 Bulb-Tite Rivets.

9.3 RIDGE CAP DETAILS

TYPICAL DETAILS
FIXED RIDGE @ PURLINS
(4'-0" MAX SPACING)



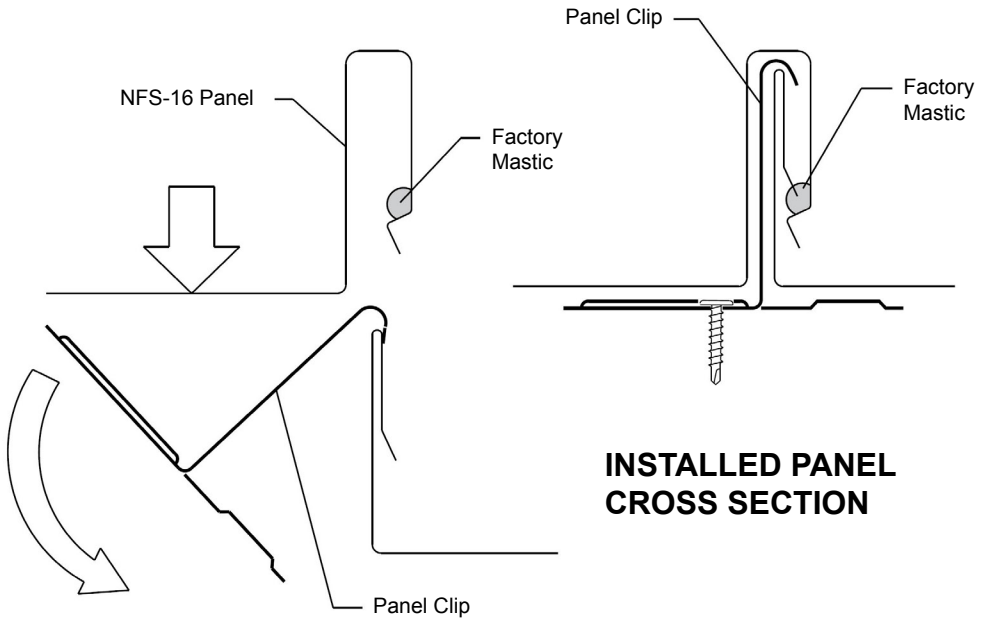


NOTES:

1. **Do not use a fixed ridge detail with a fixed eave or valley detail.**
2. Peak purlin spacing for fixed ridge is 1'-0" from the centerline of ridge to web of purlin.
3. The upslope end of the panel is 3" from the web of the peak purlin.
4. Field cut "Z" Closures to fit panel width. Cut tabs as shown.
5. Install LS-100 Tape Sealant to panels. The center of Tape Sealant should be 1 1/2" from end of panel.
6. Install "Z" Closures to panel & peak plate with Roof Fastener RF2 12" O.C. Vertical leg of "Z" Closure should be 2" from end of panel.
7. Install LS-200 Tape Sealant to top of "Z" Closure.
8. Attach Ridge/Hip Flash to "Z" Closure with Roof Fastener RF3 at 12" O.C.
9. Ridge/Hip Flashing must have urethane sealant at all endlap conditions. Use BT1 Bulb-Tite Rivets.

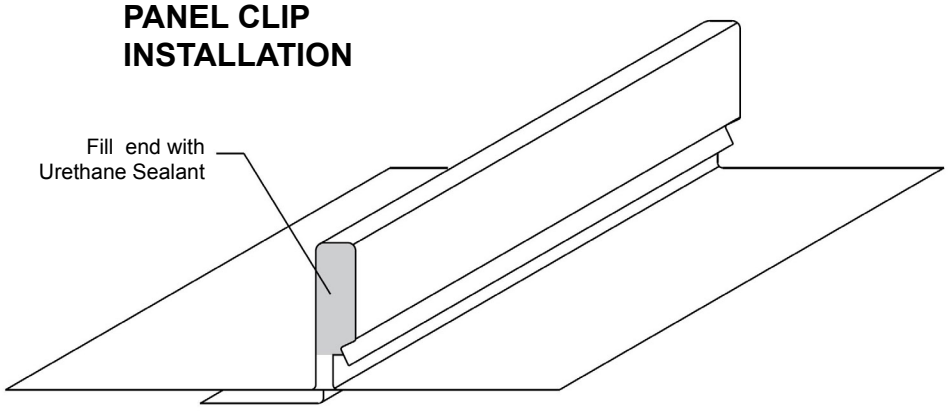
9.4 TERMINATION PANEL DETAILS

TYPICAL DETAILS
PANEL



INSTALLED PANEL CROSS SECTION

PANEL CLIP INSTALLATION



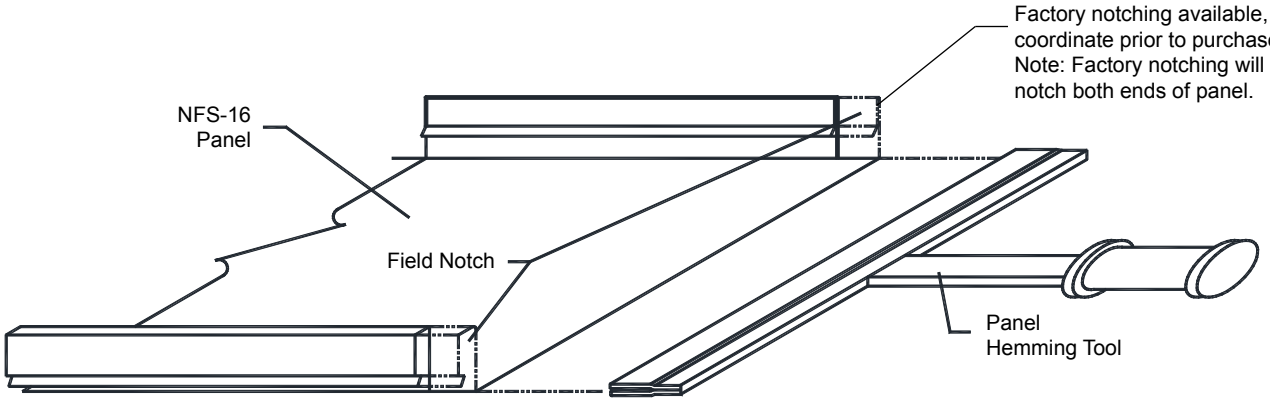
PANEL RIB END SEALANT DETAIL

NOTES:

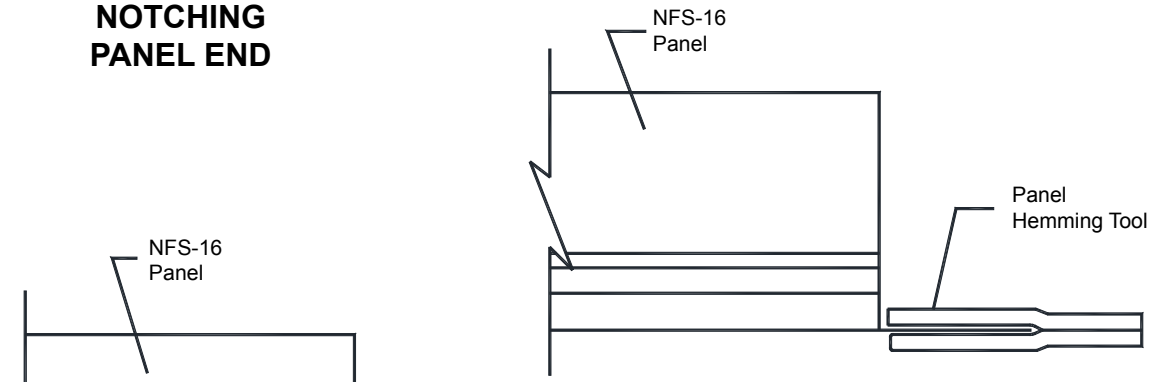
1. Fill end of panel seam at eave and valleys with urethane sealant.
2. For UL 90 rating, UL 90 Clips with two fasteners must be used for tabs and/or hems.
3. For notched panel end, coordinate prior to purchase to assure adequate panel length.

9.4 TERMINATION PANEL DETAILS

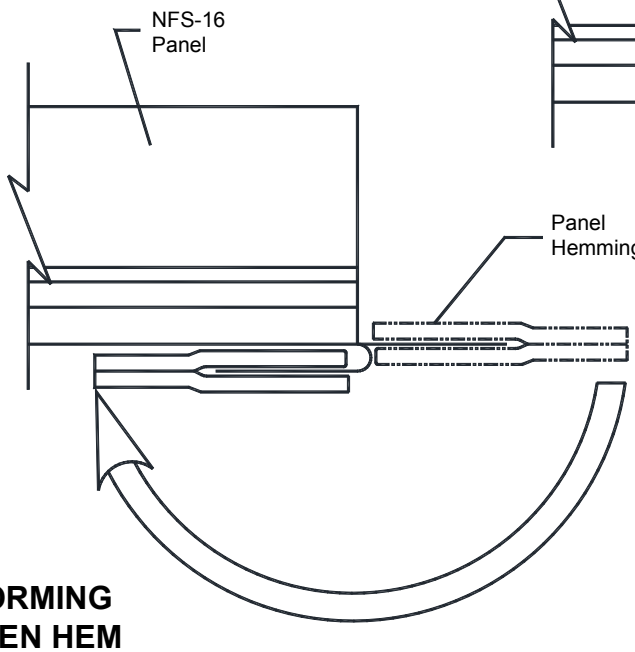
FIELD HEMMING PANEL END



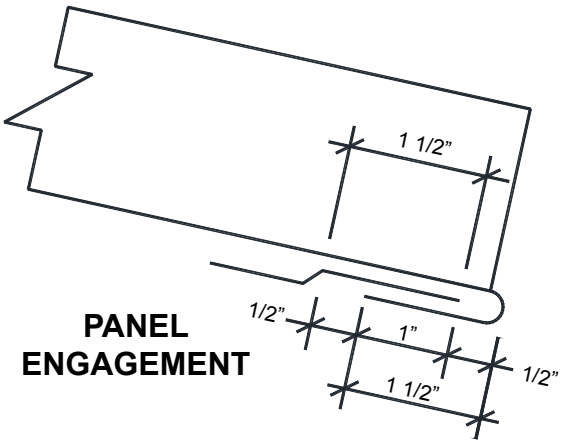
NOTCHING PANEL END



FORMING OPEN HEM



PANEL ENGAGEMENT

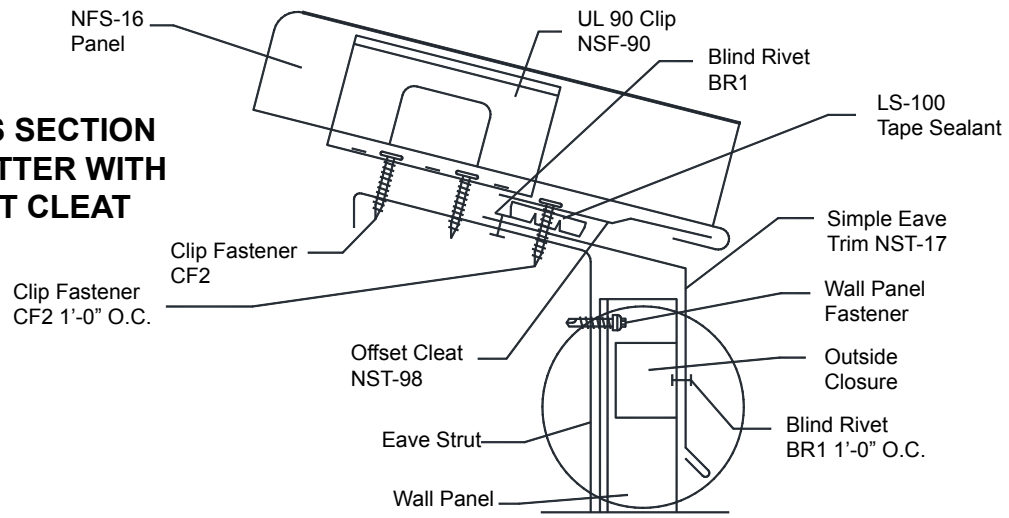


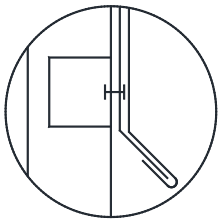
NOTES:

1. Field notch male and female legs of panel 1 1/2". (Factory notching is available, call ASI)
2. Engage panel hemming tool onto protruding panel.
3. Bend panel down to form an open hem.
4. Hem may be tightened with a pair of vise grip "duck bills."
5. **Panel enagement shown above is for panel runs up to 55' long. For panel runs over 55' long, please consider AllianceLok 16 Roof Panel System**

9.5 LOW SIDE EAVE TRIM DETAILS

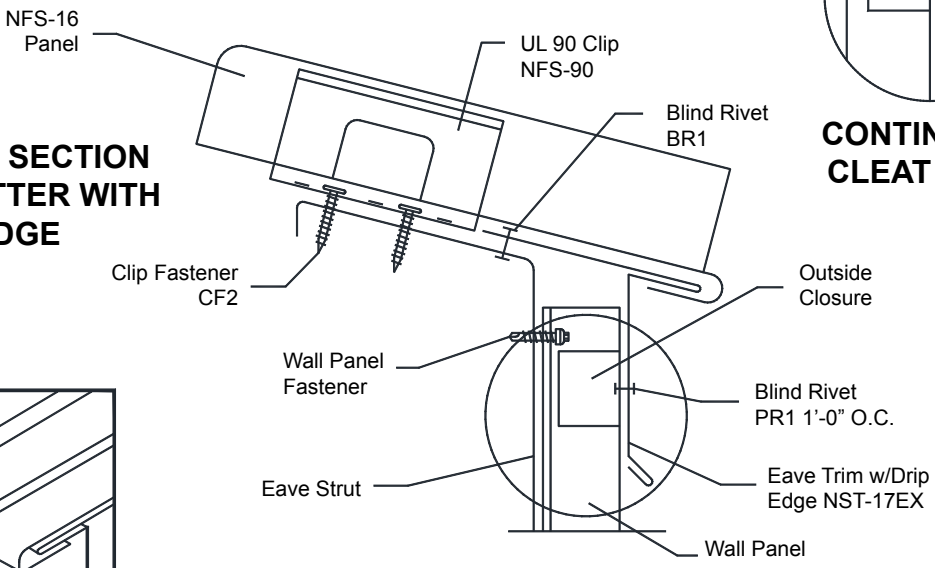
CROSS SECTION OF GUTTER WITH OFFSET CLEAT



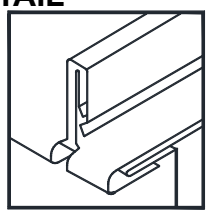


CONTINUOUS CLEAT NST-4

CROSS SECTION OF GUTTER WITH DRIP EDGE



PANEL RIB END DETAIL



NOTES:

Offset Cleat

1. **The offset cleat method of attachment should be used when ridge, peak or endlap is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Attach offset cleat to eave strut with Clip Fastener CF2 at 1'-0" O.C.
3. To field hem panel, see page 34.
4. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends.**

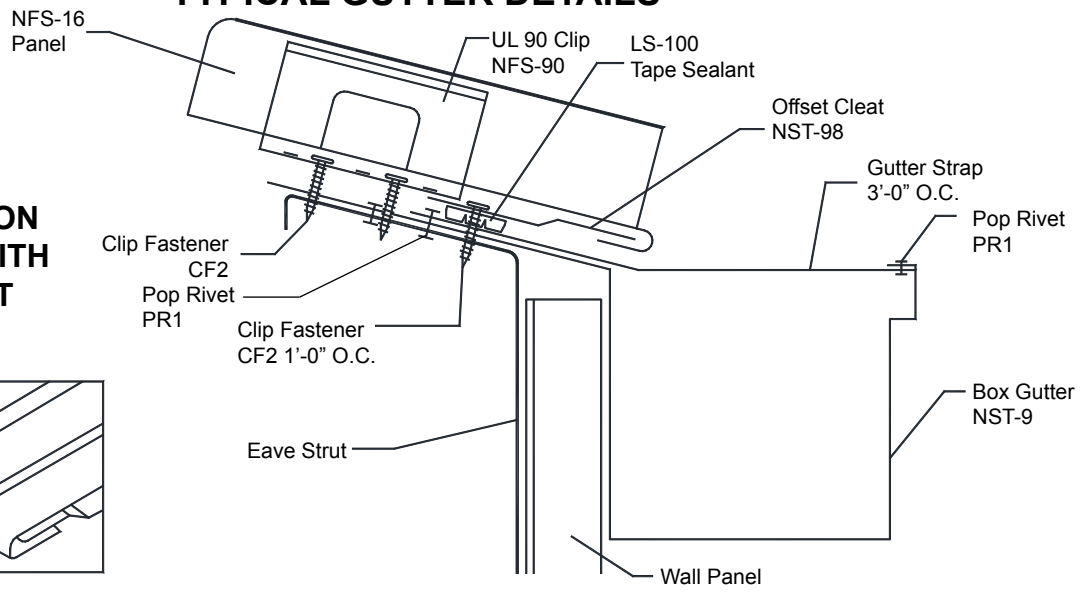
Eave Trim with Drip Edge

1. **The eave trim with drip edge method of attachment should be used when ridge or peak is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Attach eave trim to eave strut with Blind Rivet BR1 3 per 10' length.
3. To field hem panel, see page 34.
4. **See "Panel End Sealant Detail" on page 33 to seal panel ends.**
5. This detail may be used on roofs with pitches of 4:12 or less. For roofs with pitches greater than 4:12, call *Alliance Steel, Inc.*

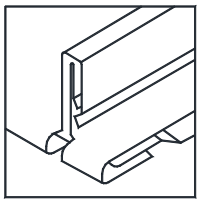
9.5 LOW SIDE EAVE TRIM DETAILS

TYPICAL GUTTER DETAILS

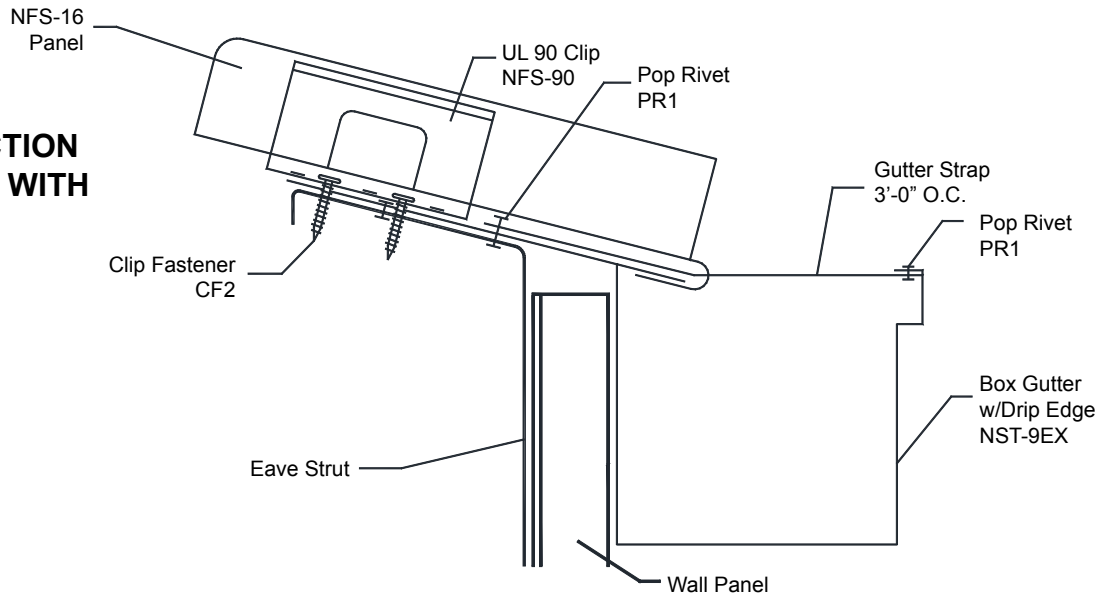
CROSS SECTION OF GUTTER WITH OFFSET CLEAT



PANEL RIB END DETAIL



CROSS SECTION OF GUTTER WITH DRIP EDGE



NOTES:

Offset Cleat

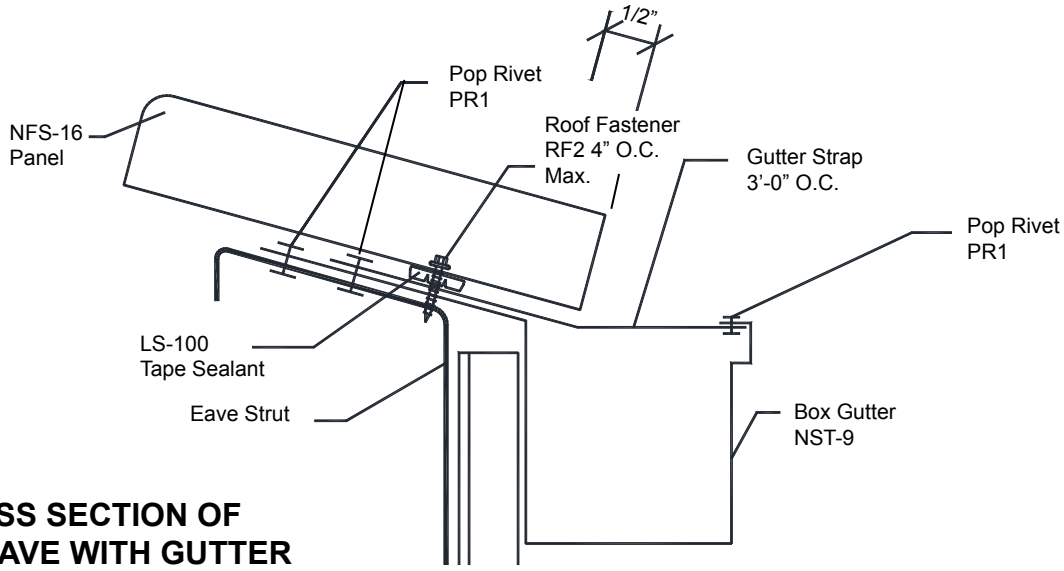
1. **The offset cleat method of attachment should be used when ridge, peak or endlap is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Attach offset cleat to eave strut with Clip Fastener CF2 at 1'-0" O.C.
3. To field hem panel, see page 34.
4. **See "Panel Rib End Sealant Detail" on page 33 to seal panel ends.**
5. The above gutter should not be used in areas that experience snow loads of 10 PSF or higher.

Gutter with Drip Edge

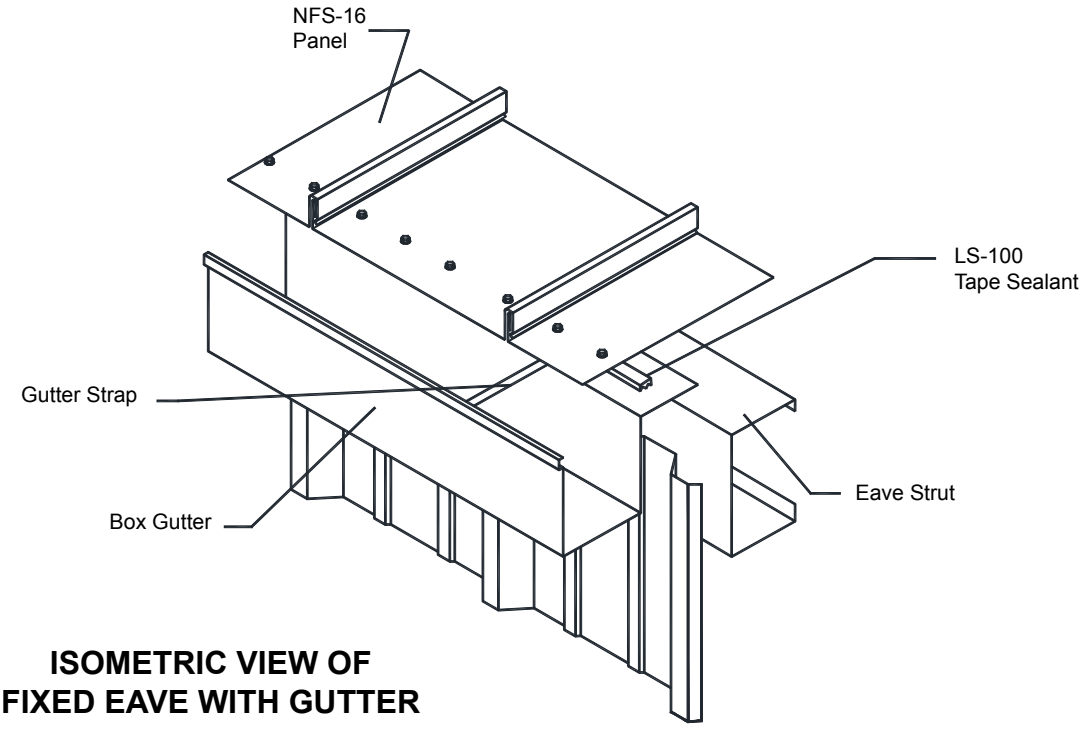
1. **The gutter with drip edge method of attachment should be used when ridge, peak or endlap is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Install gutter to eave strut with Clip Fastener CF2 at 2'-0" O.C.
3. Attach gutter straps to gutter with Pop Rivet PR1 at each gutter strap.
4. To field hem panel, see page 34.
5. Notch panel hem for gutter strap.
6. **See "Panel Rib End Sealant Detail" on page 34 to seal panel rib ends.**
7. This detail may be used on roofs with pitches of 4:12 or less. For roofs with pitches greater than 4:12, call *Alliance Steel, Inc.*
8. The above gutter should not be used in areas that experience snow loads of 10 PSF or higher.

9.5 LOW SIDE EAVE TRIM DETAILS

FIXED EAVE GUTTER DETAIL



CROSS SECTION OF FIXED EAVE WITH GUTTER



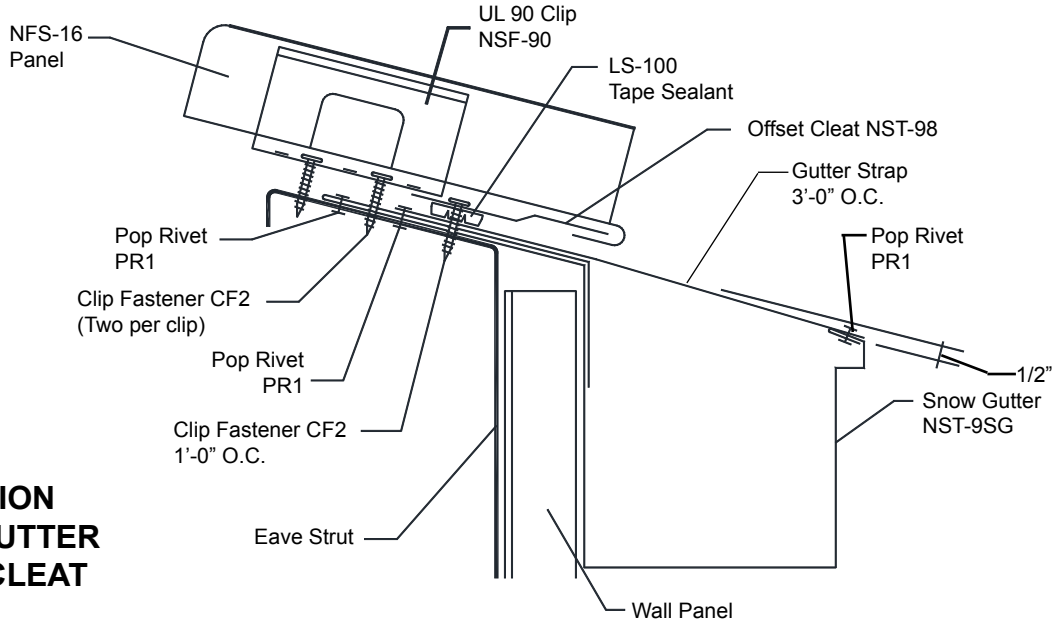
ISOMETRIC VIEW OF FIXED EAVE WITH GUTTER

NOTES:

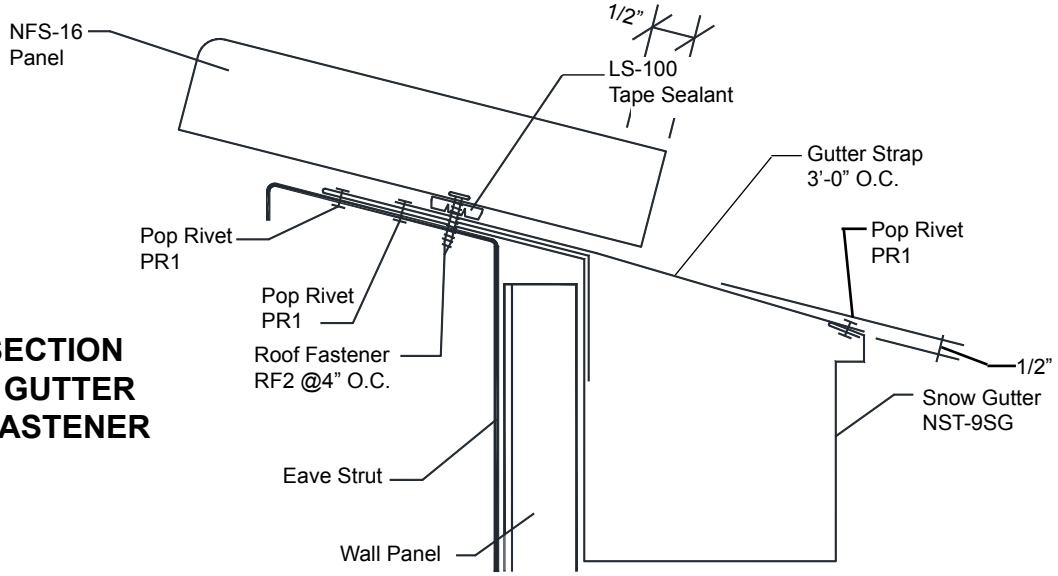
1. **Do not use fixed gutter detail with the fixed ridge or hip details.**
2. Attach gutter to eave strut with Pop Rivet PR1 (3 Fasteners per 10' piece).
3. Install gutter straps every 3'-0" of gutter length. Attach to outside leg of gutter and to eave strut with Pop Rivet PR1.
4. Apply LS-100 Tape Sealant to slope leg of gutter. Edge of Tape Sealant should align with outside edge of eave strut.
5. Install panel and fasten to eave strut with five Roof Fastener RF2 4" O.C. max. (Extend panel 1/2" into gutter).
6. **See "Panel Rib End Sealant Detail" on page 33 to seal panel ends.**
7. The above gutter should not be used in areas that experience snow loads of 10 PSF or higher.

9.5 LOW SIDE EAVE TRIM DETAILS

SNOW GUTTER DETAILS



CROSS SECTION OF FLOATING GUTTER WITH OFFSET CLEAT



CROSS SECTION OF FIXED GUTTER THOUGH FASTENER

NOTES:

Offset Cleat

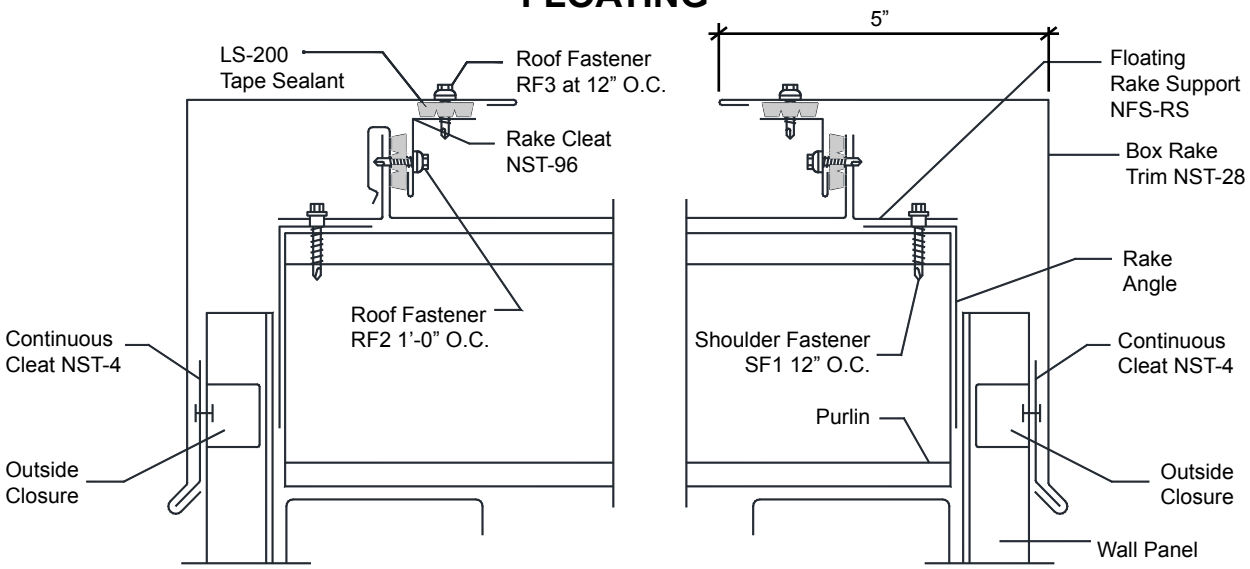
1. **The offset cleat method of attachment should be used when ridge, high side eave or endlap is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Attach offset cleat to eave strut with Clip Fastener CF2 at 1'-0" O.C. **(On plywood decks replace Clip Fastener CF2 with Clip Fastener CF3).**
3. To field hem panel, see page 34.
4. **See "Panel End Sealant Detail at Eave" on page 33 to seal panel ends.**

Through Fastened

1. **Do not use a fixed eave detail with the fixed ridge or hip details.**
2. Attach gutter to eave strut with Pop Rivet PR1 (3 fasteners per 10' piece).
3. Attach gutter straps to Pop Rivet PR1 at 3'-0" O.C.
4. Apply LS-100 Tape Sealant to slope leg of gutter.
5. Install panel and fasten to eave strut with five Roof Fastener RF2's 4" O.C. Max.
6. **See "Panel Rib End Sealant Detail at Eave" on page 33 to seal panel rib ends.**

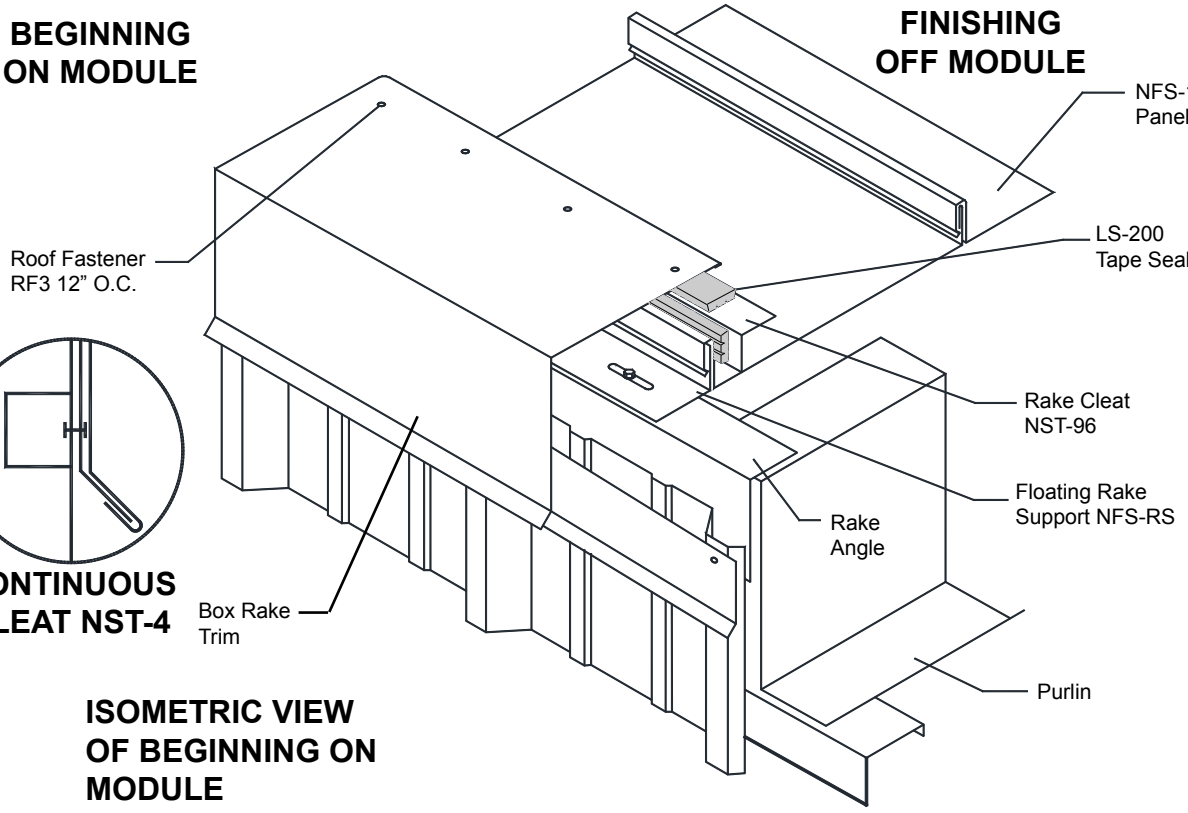
9.6 GABLE TRIM DETAILS

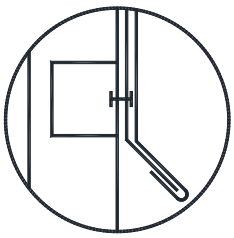
GABLE TRIM DETAILS FLOATING



BEGINNING ON MODULE

FINISHING OFF MODULE





CONTINUOUS CLEAT NST-4

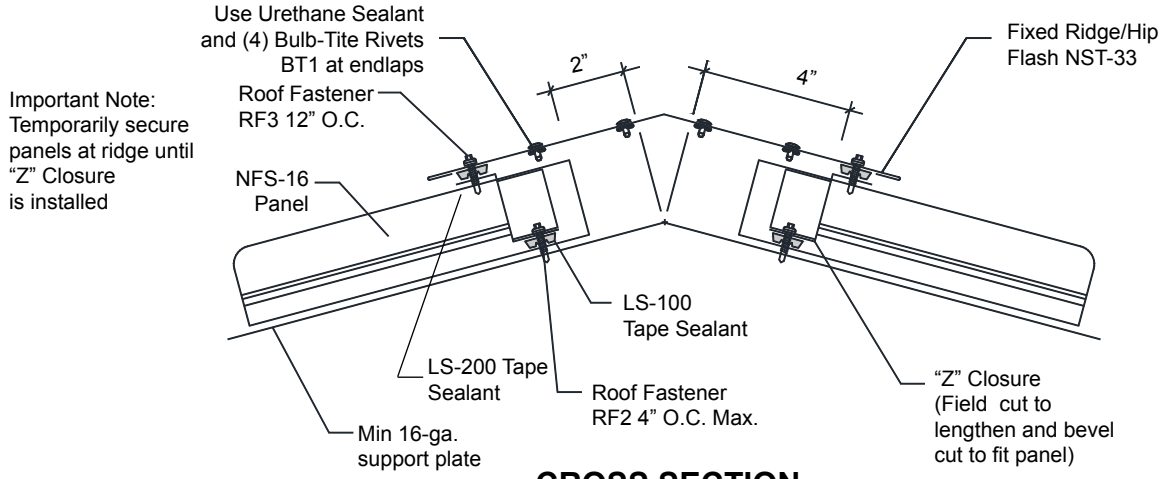
ISOMETRIC VIEW OF BEGINNING ON MODULE

NOTES:

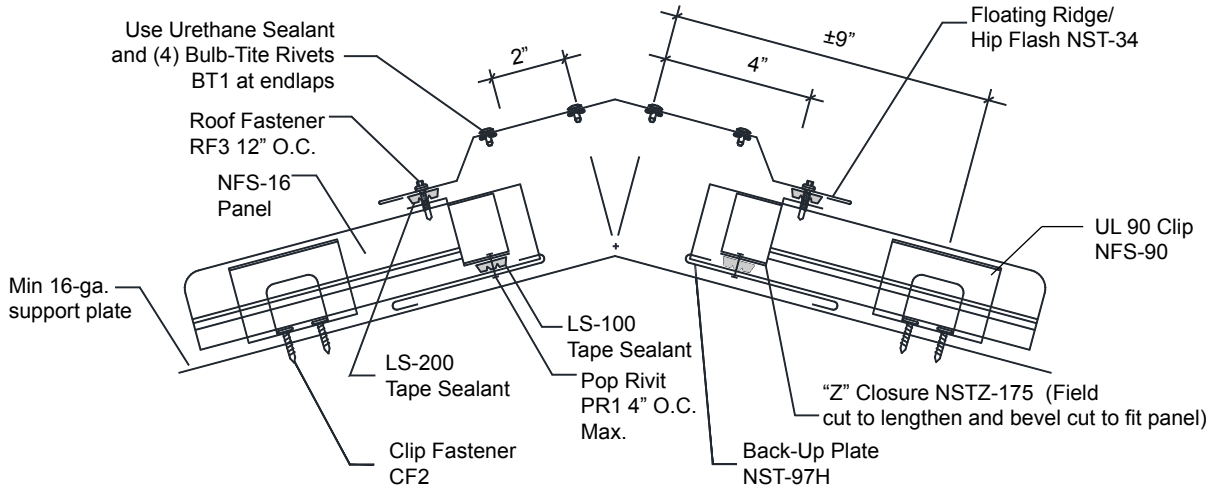
1. The top dimension of the rake will be affected by the wall panel thickness.
2. Install floating rake support with Shoulder Fastener SF1 at 12” O.C.
3. Engage female leg of panel over rake support at start of panel.
4. Apply LS-200 Tape Sealant to vertical leg of panel. Install rake cleat to panel leg with Roof Fastener RF2 at 1’-0” O.C. **FASTENERS MUST GO THROUGH RAKE SUPPORT.**
5. Apply LS-200 Tape Sealant to top of rake cleat and attach rake trim to rake cleat with Roof Fastener RF3 at 1’-0” O.C.
6. Use continuous cleat to hold bottom of rake trim in place. Fasten continuous cleat to each high rib of wall panel.
7. Field cut and bend last panel run to fit against floating roof rake support. Install rake cleat, Tape Sealant and rake trim as previously described.
8. If rake trim is not to be immediatly installed, temporarily fasten panels to rake support to prevent wind damage.

9.7 HIP AND VALLEY DETAILS

HIP DETAILS



CROSS SECTION OF FIXED HIP



CROSS SECTION OF FLOATING HIP

NOTES:

Fixed Hip

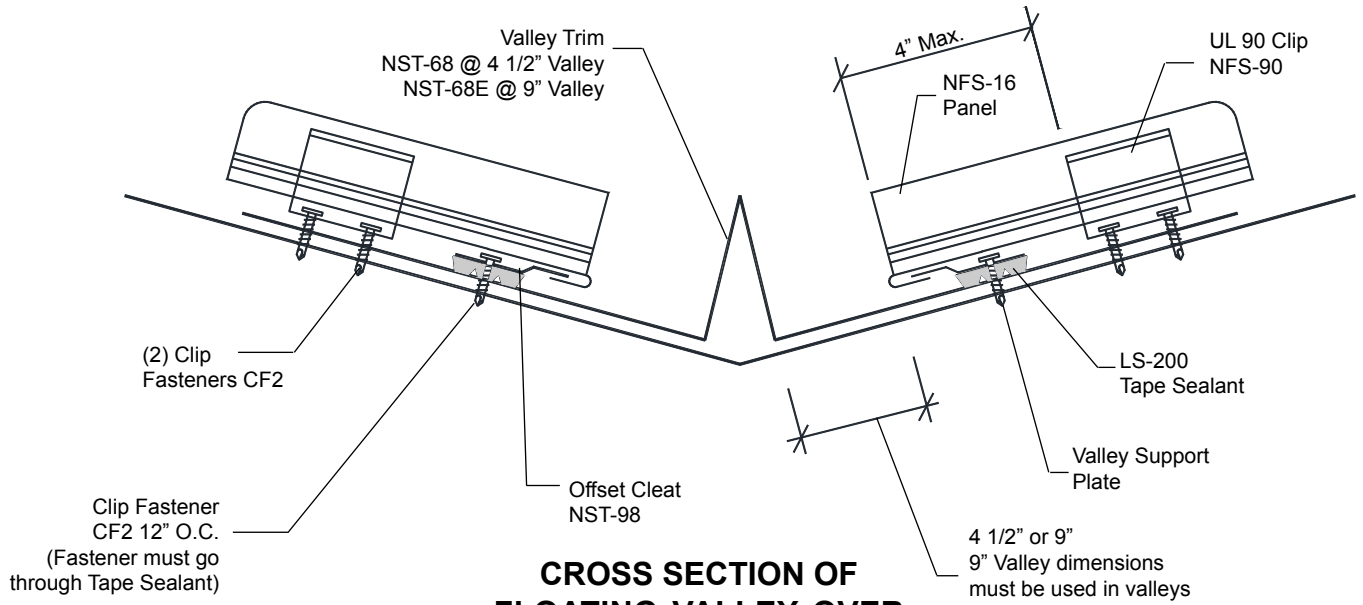
1. **Do not use a fixed hip detail with the fixed eave or valley details.**
2. Hip must be designed to suport the panels between the purlins (i.e. channel, angle or plate).
3. Bevel cut and install panels to follow slope of hip.
4. Notch panel ribs for "Z" Closure leaving primary rib vertical.
5. Install LS-100 Tape Sealant to pans of panels, running parallel to the hip. Center of Tape Sealant should be 3 1/2" from the center of the hip.
6. Install "Z" Closures to panels with Roof Fastener RF2 at 4" O.C. Max. Vertical leg of "Z" Closure should be 4" from the center of the hip.

Floating Hip

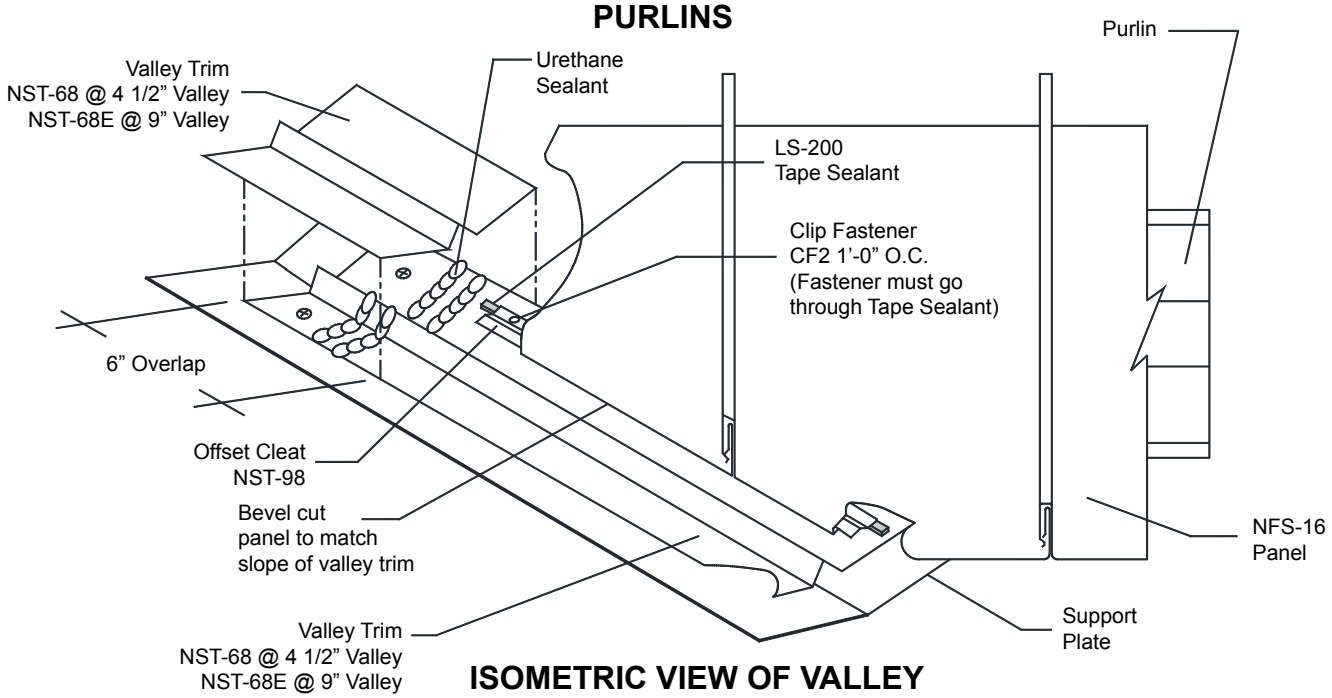
1. **Do not use a floating hip detail with the offset cleat method of attachment at the eave or valley.**
2. Bevel cut and install panels to follow slope of hip.
3. Notch panel ribs for "Z" Closure leaving primary rib vertical.
4. Install LS-100 Tape Sealant to pans of panels, running parallel to the hip. Center of Tape Sealant should be 3 1/2" from center of hip.
5. Clip NFS-BP Back-Up Plate end to end on bevel cut panels. Notch top of back-up plate at panel ribs. **Do not fasten to hip suport plate. This will restrain the panels from floating.**
6. Install "Z" Closures to panels and back-up plate with Pop Rivit PR1 at 4" O.C. max. Vertical leg of "Z" Closure should be 4" from center of hip.

9.7 HIP AND VALLEY DETAILS

FLOATING VALLEY DETAIL



CROSS SECTION OF FLOATING VALLEY OVER PURLINS



ISOMETRIC VIEW OF VALLEY

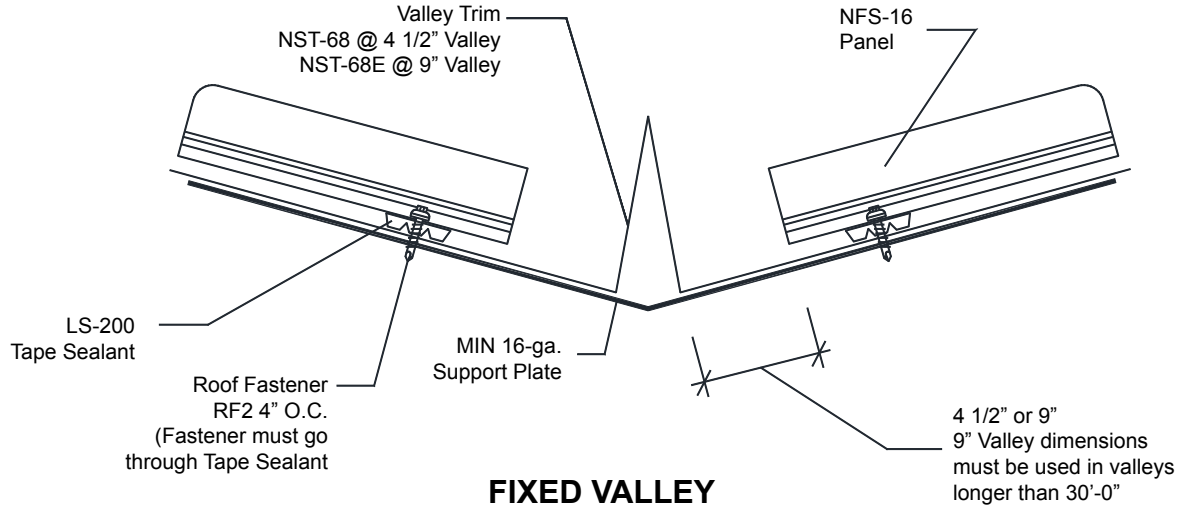
NOTES:

VALLEY WITH OFFSET CLEAT

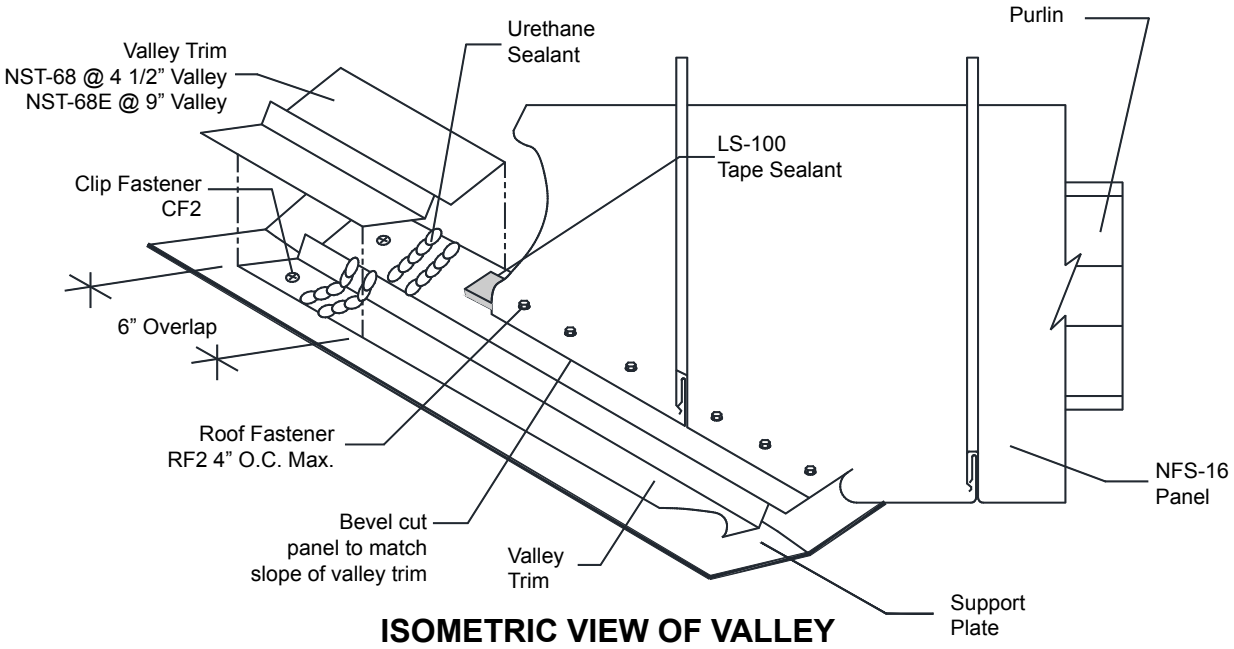
1. For valleys longer than 30', use extended valley trim.
2. **Panels must be attached to substructure at the ridge or hip to prevent them from sliding downslope.**
3. Offset cleat is installed continuous along slope of valley over LS-200 Tape Sealant with Clip Fastener CF2 at 12" O.C. **Fasteners must go through Tape Sealant.**
4. Clip spacing should not exceed 4'-0" O.C.
5. **Add 1 1/2" to panel length for the panel hem.**
6. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends at valley.**

9.7 HIP AND VALLEY DETAILS

FIXED VALLEY DETAIL



FIXED VALLEY



ISOMETRIC VIEW OF VALLEY

Valley plate must be designed to support the panels between the purlins.
(i.e. channel, angle, or plate)

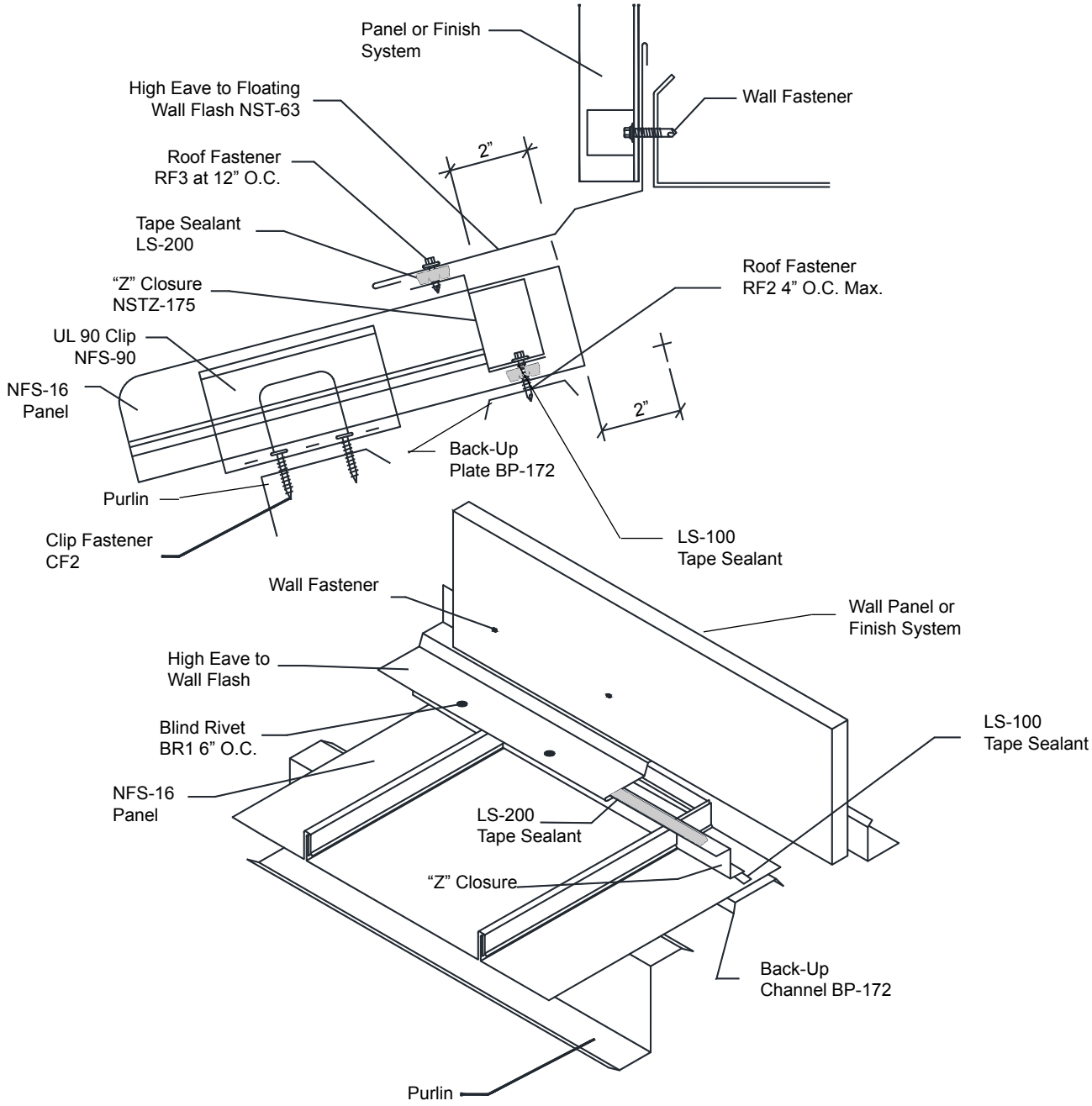
NOTES:

Standard Ridge Flash Conditions

1. For valleys longer than 30'-0", use extended valley trim.
2. **Do not use a fixed valley detail with the fixed ridge or hip details.**
3. Ends of panels should be 4 1/2" minimum from the vertical leg of valley trim.
4. Install LS-200 Tape Sealant continuously under NFS-16 panel.
5. Attach panel to support plate with Roof Fastener RF2 at 4" O.C. max. **Fasteners must go through Tape Sealant under panel.**
6. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends at valley.**

9.8 ROOF TO WALL TRANSITION DETAILS

HIGH EAVE TO WALL W/ PURLIN

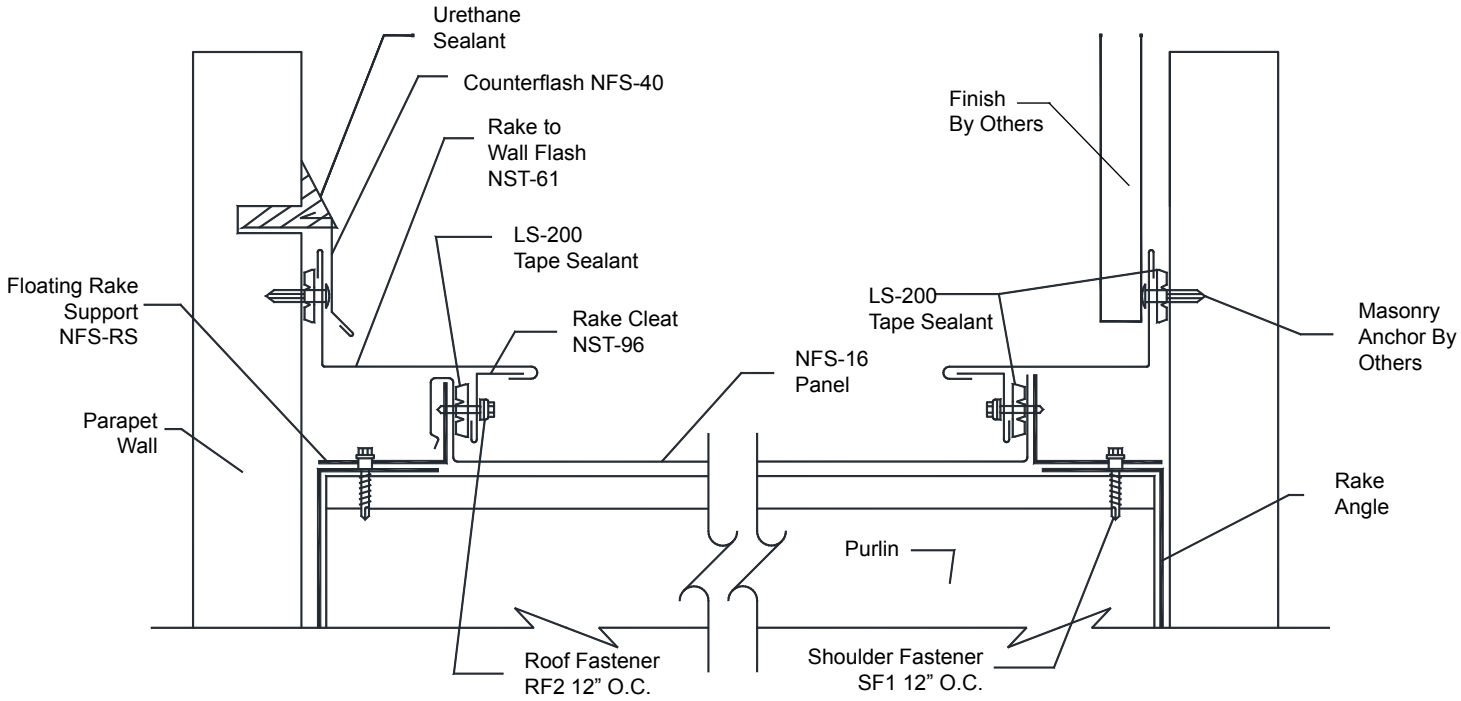


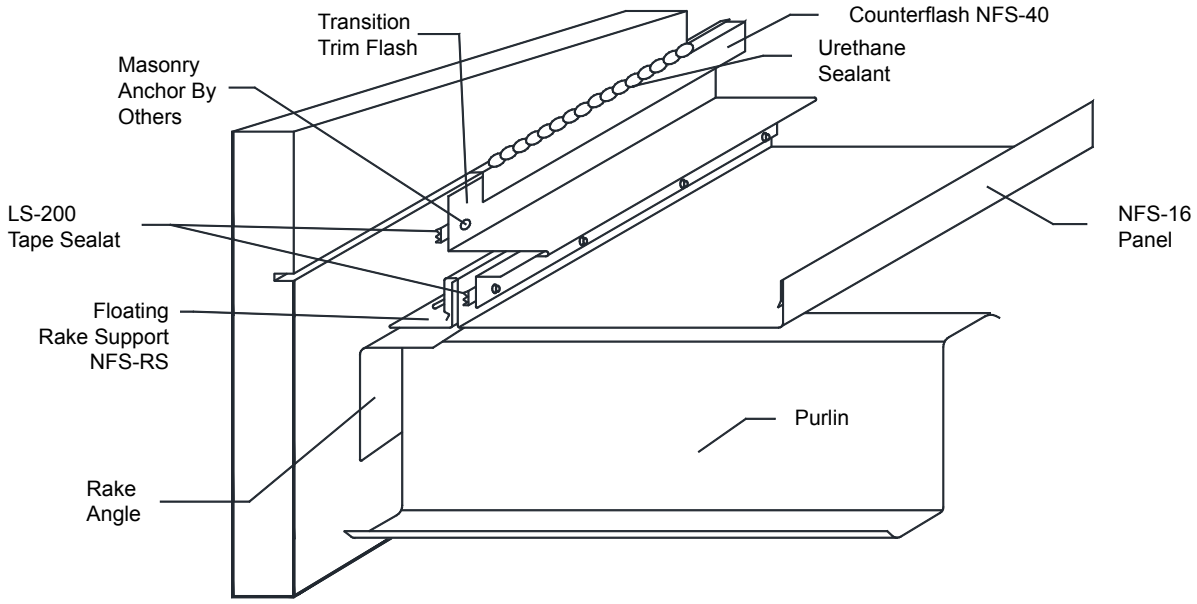
NOTES:

1. **Do not use a floating detail with the offset cleat method of attachment at the eave or valley.**
2. Notch panel ribs for "Z" Closure leaving primary rib vertical.
3. Install back-up channel onto end of panel.
4. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
5. Apply LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
6. Install "Z" Closures to panel with Roof Fastener RF2 at 4" O.C. max. Vertical leg of "Z" Closures should be 2" from end of panels.
7. Apply LS-200 Tape Sealant to the top leg of "Z" Closures.
8. Attach high eave to wall trim to "Z" Closure with Roof Fastener RF3 at 12" O.C.

9.8 ROOF TO WALL TRANSITION DETAILS

RAKE TO WALL FLOATING



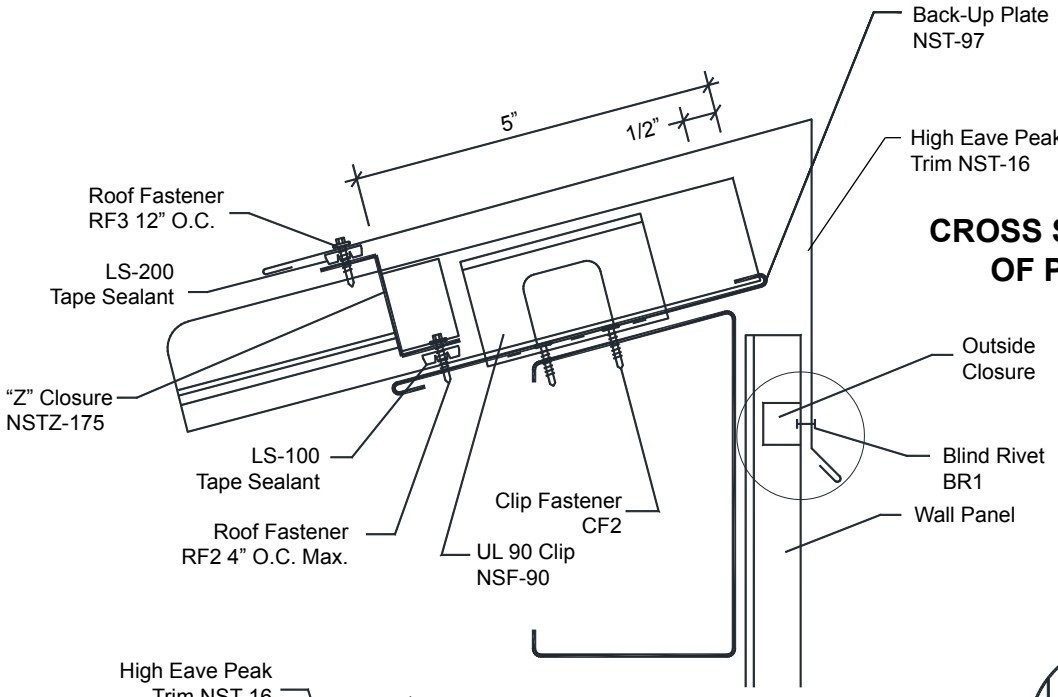


NOTES:

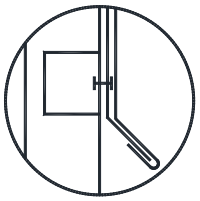
1. Install floating rake support with Shoulder Fastener SF1 at 12" O.C.
2. Engage female leg of panel over rake support.
3. Apply LS-200 Tape Sealant to vertical leg of panel. Install rake cleat to panel leg with Roof Fastener RF2 at 1'-0" O.C. **FASTENERS MUST GO THROUGH RAKE SUPPORT.**
4. Engage open hem of rake to wall flash onto rake cleat and fasten top leg to wall with masonry anchor (by others).
5. If roof finishes on module, finishing detail will be similar to starting detail. If roof finishes off module, field cut and bend last panel run to fit against floating rake support. Install rake cleat, Tape Sealant and rake to wall flash as previously described.
6. If rake to wall flash is not to be immediatly installed, temporarily fasten panels to rake support to prevent wind damage.

9.9 HIGH EAVE TRIM DETAILS

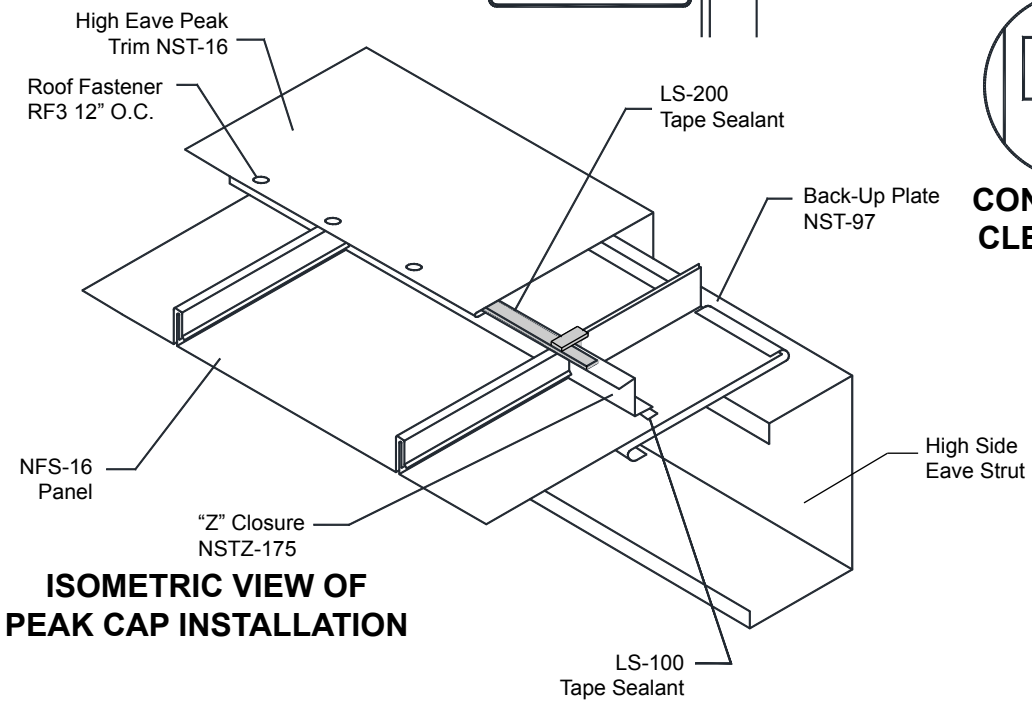
FLOATING HIGH EAVE PEAK



CROSS SECTION OF PEAK



CONTINUOUS CLEAT NST-4



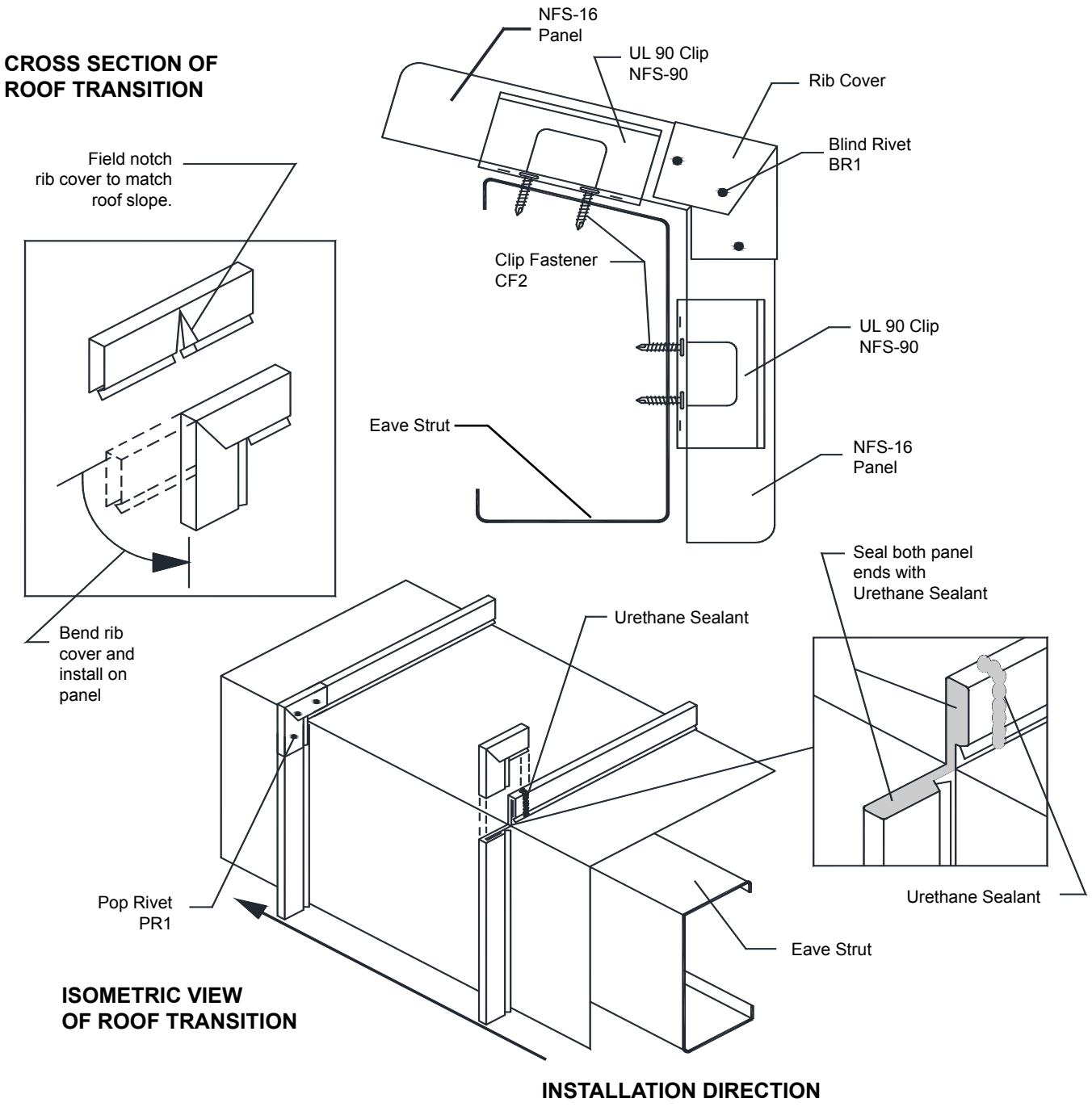
ISOMETRIC VIEW OF PEAK CAP INSTALLATION

NOTES:

1. **Do not use a floating high eave peak detail with the offset cleat method of attachment at the eave or valley details.**
2. Notch panel ribs for "Z" Closure leaving primary rib verticle.
3. Install Backup plate onto end of panel.
4. Install panel and clips.
5. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
6. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 4 1/2" from end of panel.
7. Install "Z" Closures to panels and back-up plate with Roof Fastener RF2 at 12" O.C. Vertical leg of "Z" Closure should be 5" from end of panel.
8. Install LS-200 Tape Sealant to top leg of "Z" Closure.
9. Attach High Eave Peak Trim to "Z" Closure with Roof Fastener RF3 at 12" O.C.

9.10 ROOF TRANSITION DETAIL

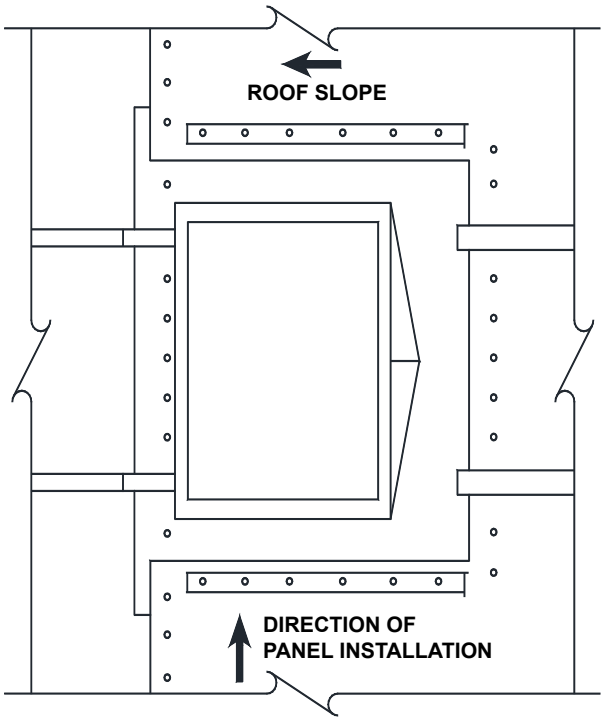
RIB COVER

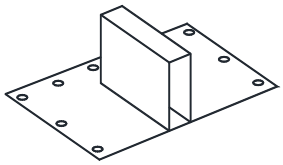


NOTES:

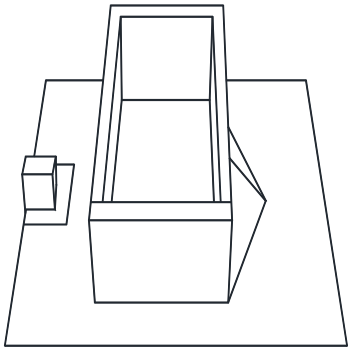
1. Do not use a fixed eave detail with the fixed ridge or hip details.
2. Field cut panels and bend to required angle.
3. Fill both exposed ends of panel with urethane sealant.
4. Field notch rib cover to allow it to bend to proper angle.
5. Field apply a bead of urethane sealant over rib before applying rib cover
6. **Do not use this detail over the building envelope.**

9.11 ROOF CURB INSTALLATION INSTRUCTIONS

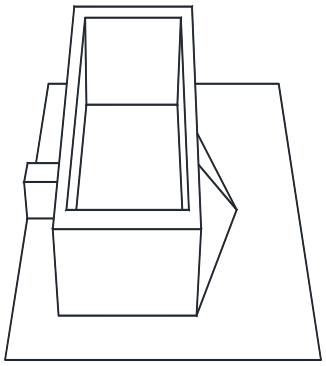




LOOSE CAP CELL
(SPECIFY LEFT OR RIGHT-
RIGHT SHOWN)



ROOF CURB WITH
LOOSE CAP CELL



ROOF CURB WITH FACTORY
ATTACHED CAP CELL

ASI recommends that only one-piece .080 Aluminum (Min.) roof curbs be used with the NFS-16 roof system. The roof curb will be installed under the roof panels on the upslope end and over the panels at the downslope end. To accomplish this, the roof panels must be endlapped at the upslope and downslope end of the curb.This allows both ends of the curb to shed water and places the heavier gauge metal of the curb under the roof panels for better resistance to foot traffic. The exception is at the downslope end where the curb is on top of the roof panels. Since there are endlaps at this area, the back-up channels provide support. Cinch straps (18 gauge Galv.) furnished by the curb manufacturer are used at the sides of the curb to form a compression seal.

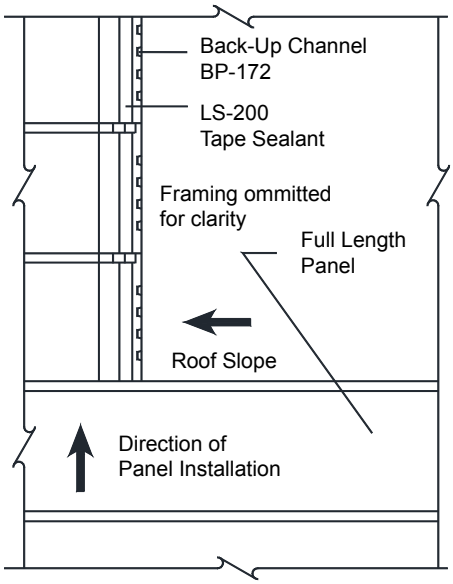
Outside cap cells (for bottom) are used to seal the panel to the roof curb. If curb placement is not critical (within 12”), the cap cells may be factory attached to the curb. If the curb must be located in a precise location, order the cap cells loose for field installation.

For the purpose of these instructions, a curb with factory attached cap cell is illustrated. panels are assumed to be blank and installed right to left.

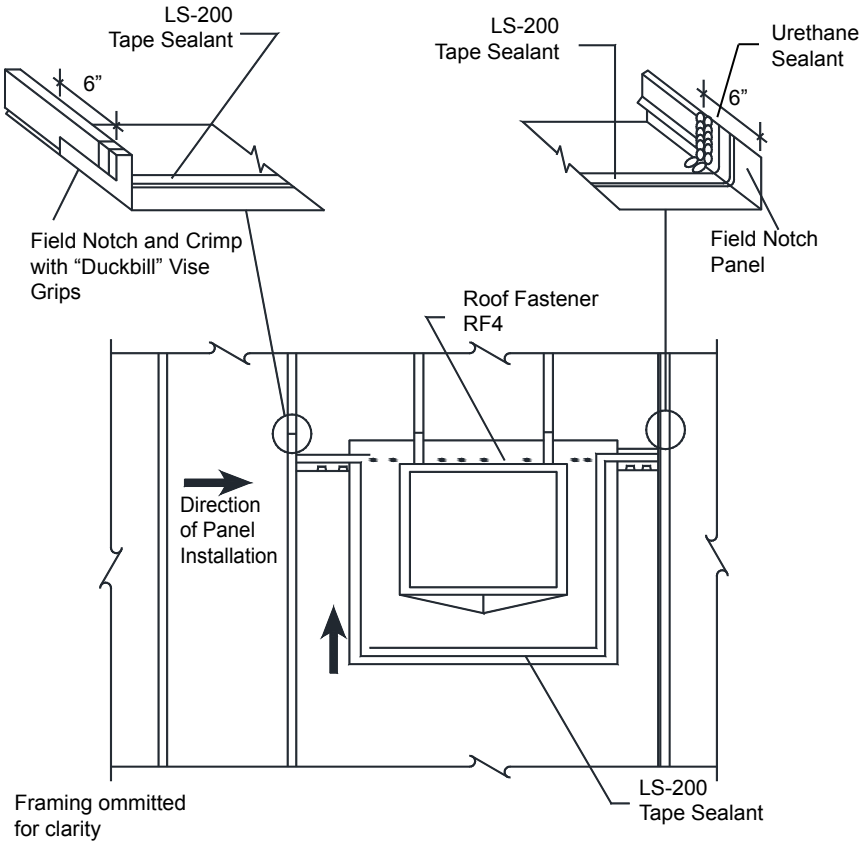
CAUTION

It is the user’s responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal and OSHA regulations and laws, including, but not limited to, guarding roof openings with plywood, fixed standard railings, or other acceptable saftey controls that prevent fall-through.

9.11 ROOF CURB INSTALLATION INSTRUCTIONS (continued)



Full length panels may be installed up to the curb location. All panel runs affected by a roof curb must have field endlaps at the upslope and downslope end of the curb. Provision must be made for this condition by ordering two panels 12” longer than the panels immediately adjacent to the curb. The panels do not need to be ordered with pre-punched holes. Install all bottom panels, attaching the back-up channel and apply LS-200 Tape Sealant to each panel as it is being installed. **It is critical that the Tape Sealant be installed across the full panel width.** Failure to follow this procedure will cause the curb to leak during rains coupled with high winds.



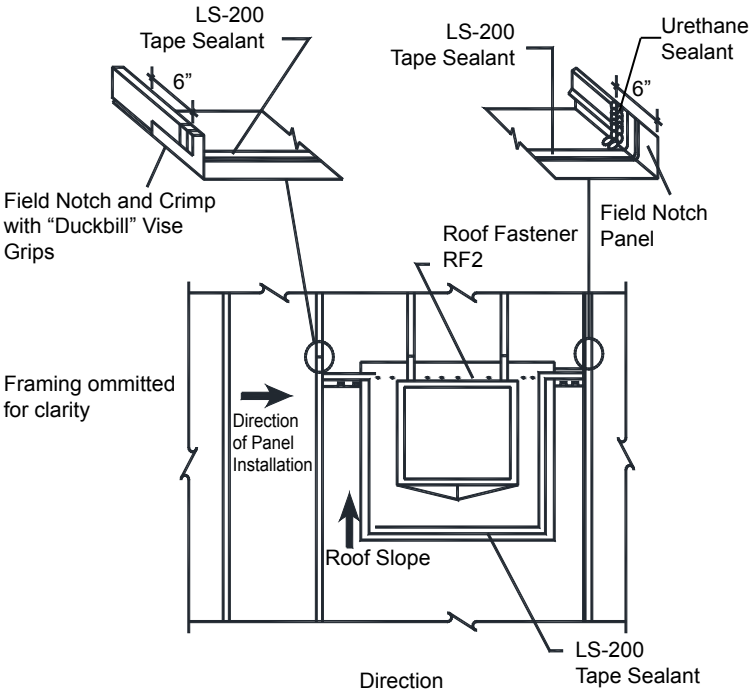
The first downslope panel immediately adjacent to the last full length panel will require field notching of the female leg for a distance of 6”. Notch the panel just above the lock in the female leg. The remaining portion of the female leg will need to be crimped with “duckbill” vise grips.

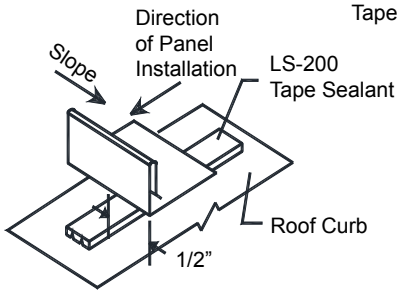
The last downslope panel immediatly adjacent to the first full length panel after the curb will require field notching of the male leg for a distance of 6”. Notch the panel by removing the male “lock” leg only. Apply two beads of urethane sealant vertically to the downslope end of the notch.

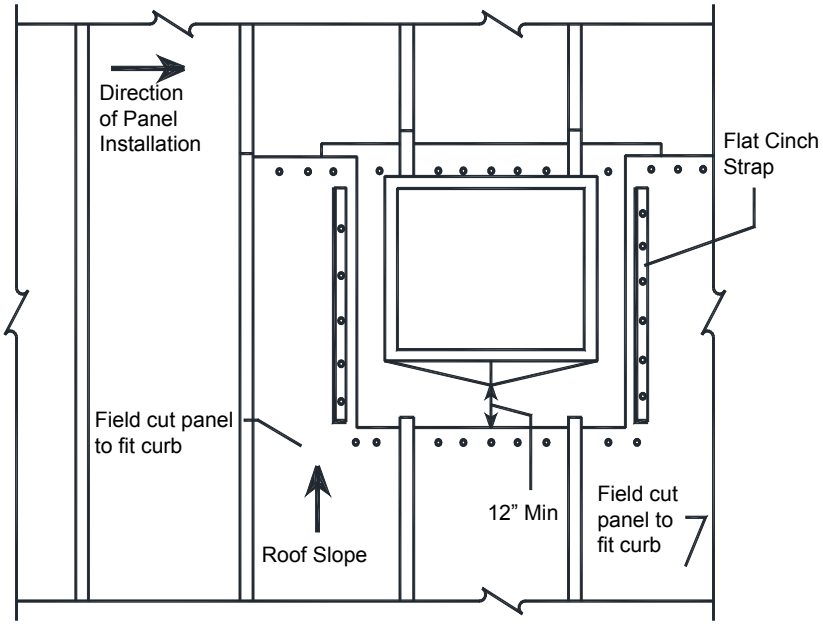
CAUTION

It is the user’s responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal and OSHA regulations and laws, including, but not limited to, guarding roof openings with plywood, fixed standard railings, or other acceptable saftey controls that prevent fall-through.

9.11 ROOF CURB INSTALLATION INSTRUCTIONS (continued)







Install curb on top of bottom panels and curb support framing. When using a loose cap cell, the curb flange must be notched out to accept the panel rib. Apply LS-200 Tape Sealant to the sides and upslope end of curb. Fasten the downslope end of curb to the bottom roof panels and back-up channels with Roof Fastener RF2 at 3" O.C. max. Fasteners must go through the Tape Sealant.

Install the top run of panels cutting the panels at each side of the curb to fit. Apply urethane sealant to seams of all panels on the upslope end of the curb. End of top panels should be a minimum of 12" from the point of the water diverter. The top panel should lap onto the curb 6".

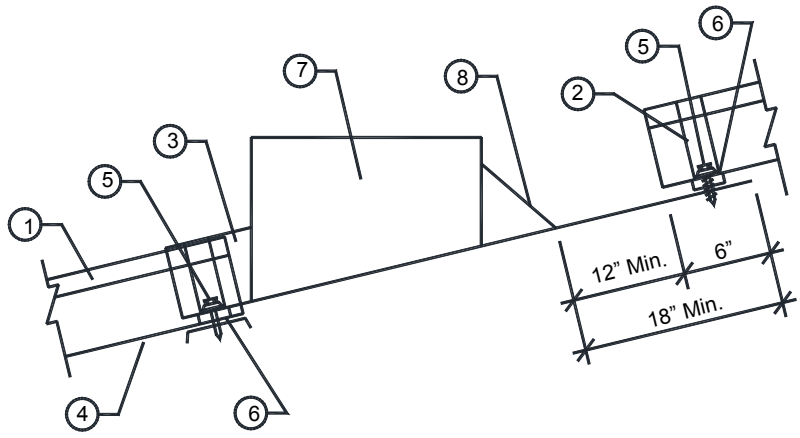
Install cinch straps at sides of curb to form a compression seal (cinch straps not by ASI) Fasten cinch straps and top panels with Roof Fastener RF2 at 3" O.C. Fasteners must go through the Tape Sealant..

Full length panels may now once again be used.

CAUTION

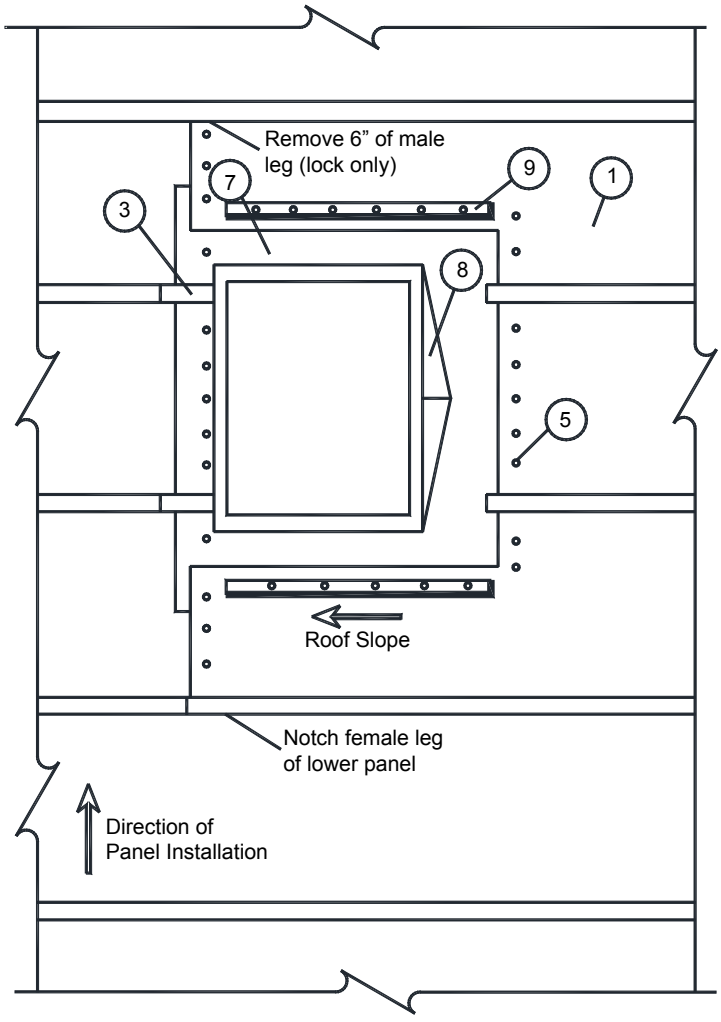
It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal and OSHA regulations and laws, including, but not limited to, guarding roof openings with plywood, fixed standard railings, or other acceptable saftey controls that prevent fall-through.

9.11 ROOF CURB INSTALLATION INSTRUCTIONS (continued)



1. NFS-16 Panel
2. Urethane Sealant
3. Outside Cap Cell
4. BP-172 Back-Up Plate
5. Roof Fastener RF4
6. LS-200 Tape Sealant
7. Roof Curb
8. Water Diverter
9. Cinch Strap, Flat

When ordering curbs, specify one-piece curbs as shown on this page.

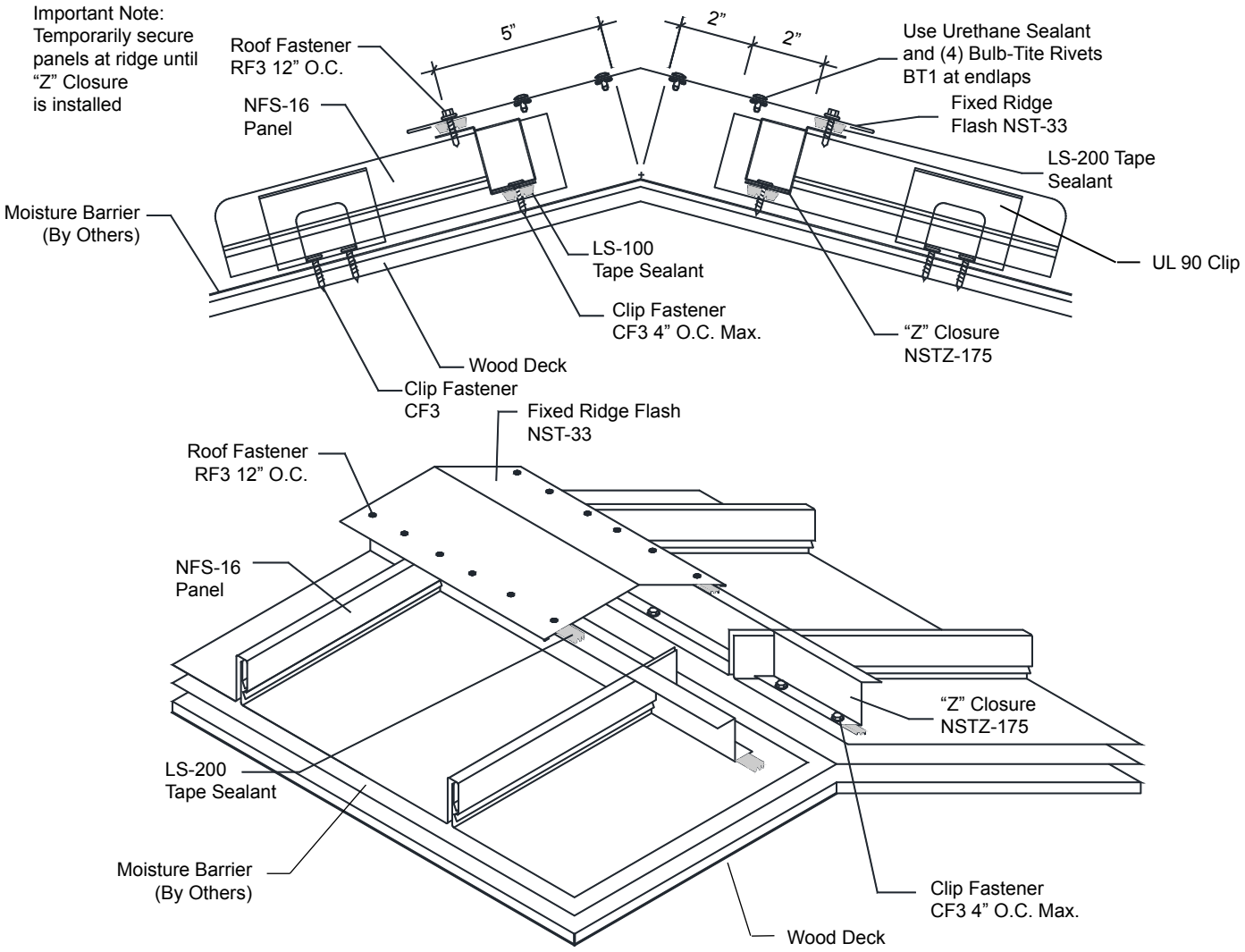


CAUTION

It is the user's responsibility to ensure that openings cut into the roof for installation of roof curbs comply with State, Federal and OSHA regulations and laws, including, but not limited to, guarding roof openings with plywood, fixed standard railings, or other acceptable saftey controls that prevent fall-through.

10.1 RIDGE CAP DETAILS OVER WOOD DECK

FIXED RIDGE DETAIL
(3'-0" MAX CLIP SPACING)

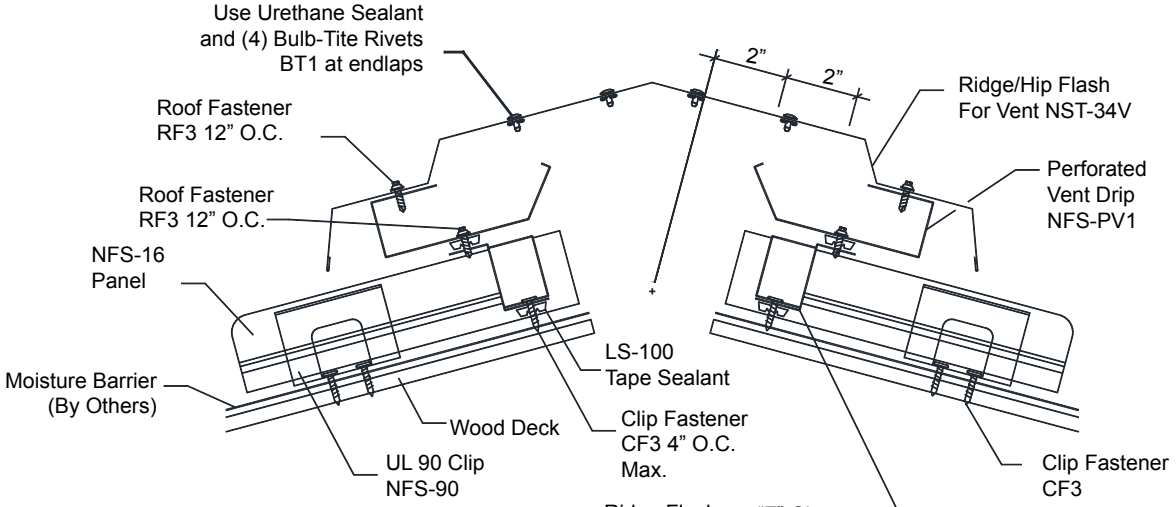


NOTES:

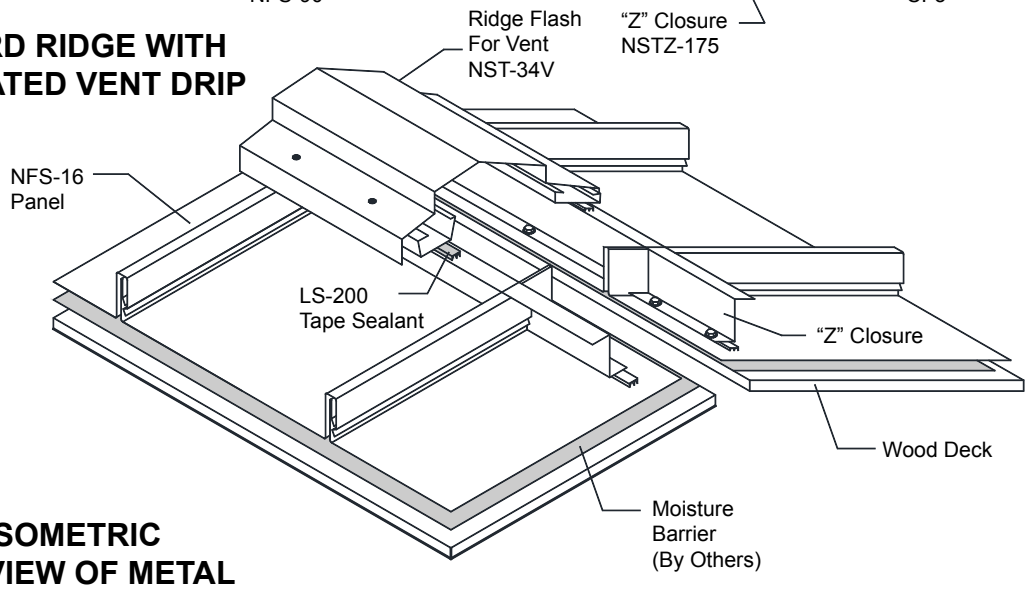
1. **Do not use a fixed ridge detail with the fixed eave or valley details.**
2. Notch panel ribs for "Z" Closure leaving primary rib vertical.
3. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
4. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
5. Install "Z" Closures to panels with Clip Fastener CF3 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel. Fasteners must go through Tape Sealant.
6. Install LS-200 Tape Sealant to top of "Z" Closure.
7. Install fixed ridge flash onto "Z" Closure with Roof Fastener RF3 at 12" O.C.

10.1 RIDGE CAP DETAILS OVER WOOD DECK

VENTED RIDGE DETAIL
(3'-0" MAX CLIP SPACING)



STANDARD RIDGE WITH PERFORATED VENT DRIP



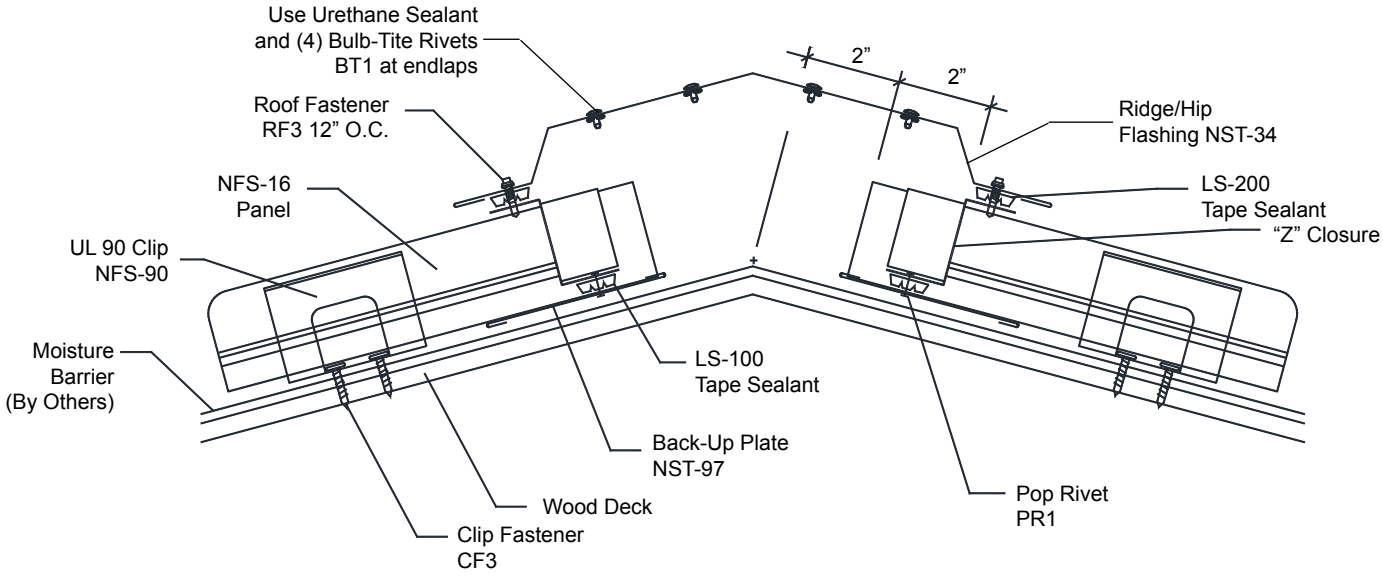
ISOMETRIC VIEW OF METAL VENT DRIP

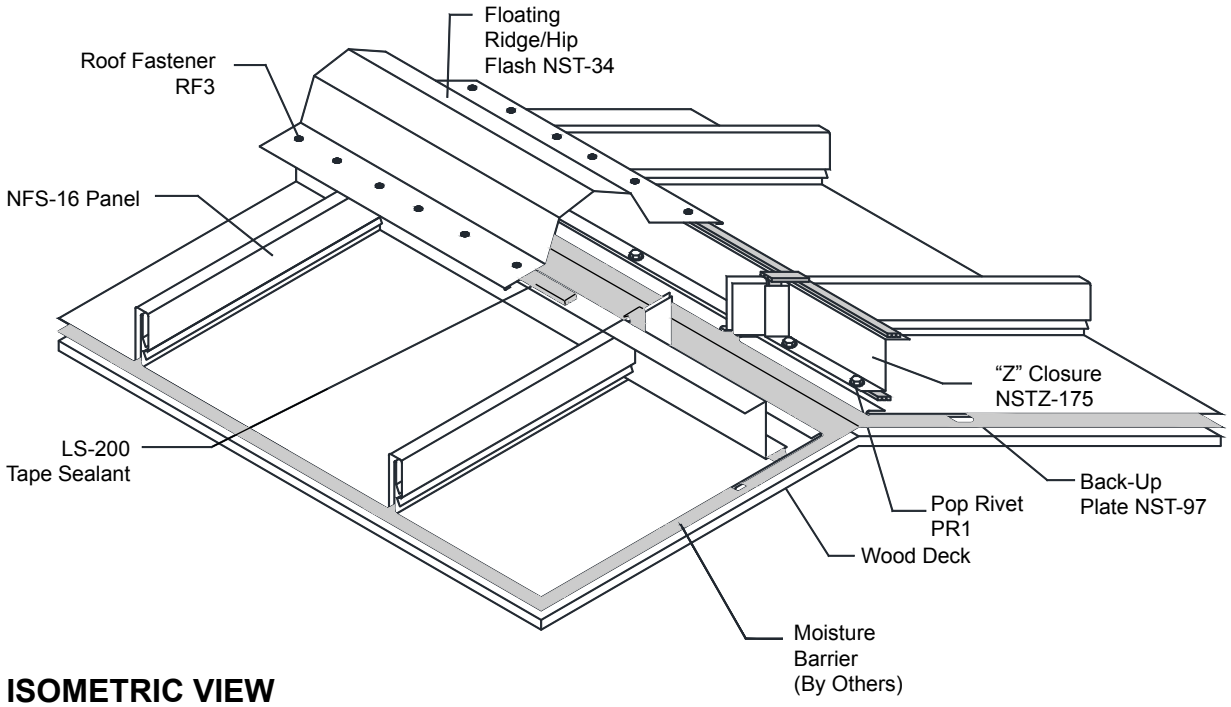
NOTES:

1. **Do not use a floating ridge detail with the fixed eave or valley details.**
2. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
3. Notch panel tabs for "Z" Closures leaving primary rib vertical.
4. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
5. Install "Z" Closures to panels with Clip Fastener CF3 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel. Fasteners must go through Tape Sealant.
6. Run LS-200 Tape Sealant at top of "Z" Closure.
7. Install vented metal to outside closures with Roof Fastener RF3 at 12" O.C.
8. Attach Ridge Flash with Roof Fastener RF3 at 12" O.C. to vented metal.
9. **Balance vent exhaust at ridge with vent intake at eave or soffit. Metal vent material must have urethane sealant at all trim lap conditions**
10. Ridge/Hip Flash must have urethane sealant at laps. Use BT-1 Bulb-Tite Rivets.

10.1 RIDGE CAP DETAILS OVER WOOD DECK

FLOATING RIDGE DETAIL
(3'-0" MAX CLIP SPACING)





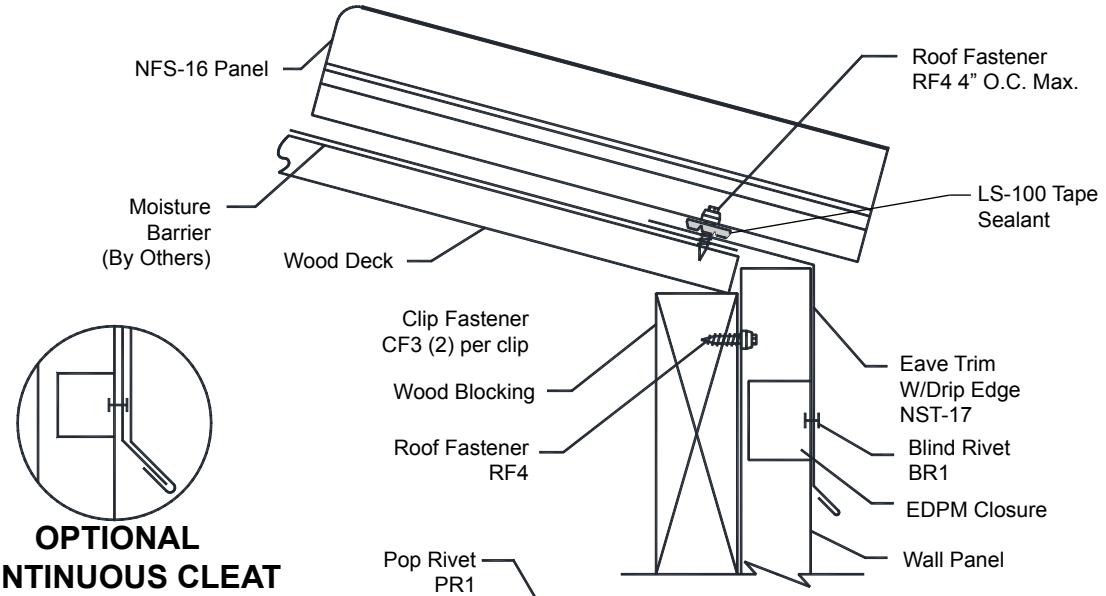
ISOMETRIC VIEW OF FLOATING RIDGE OVER WOOD DECK

NOTES:

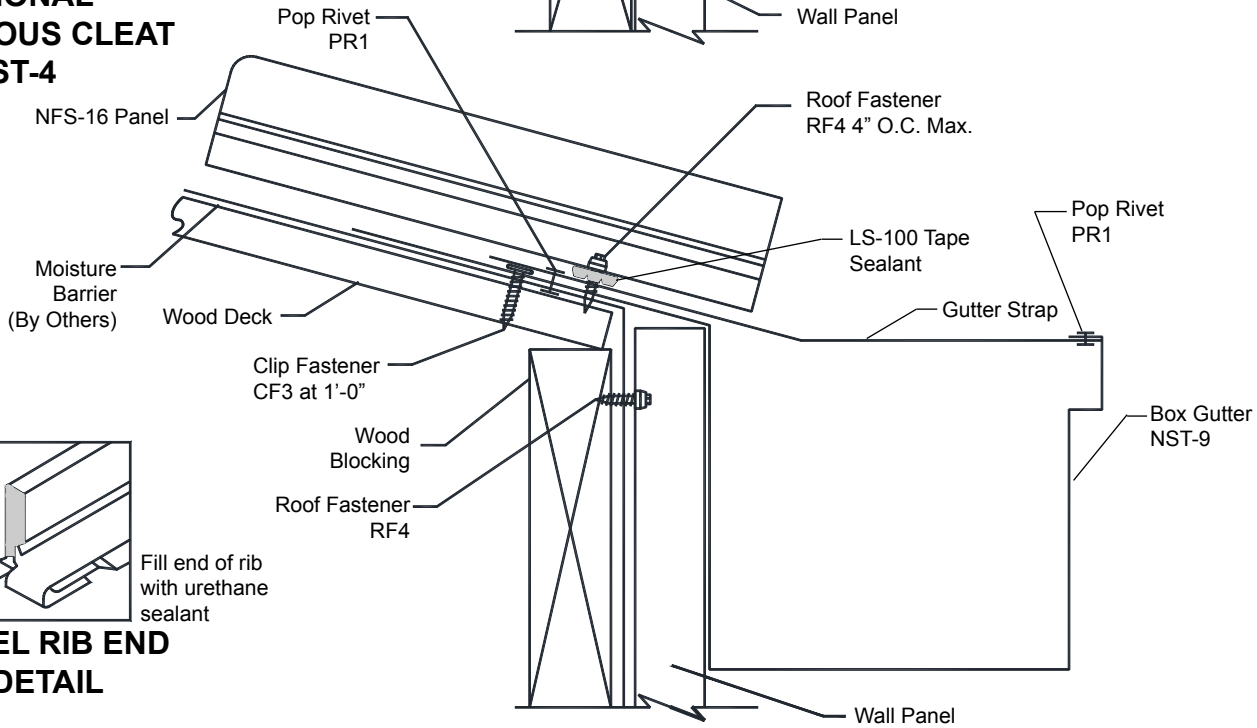
1. **Do not use a floating ridge detail with floating eave or valley details.**
2. Notch panel rib for "Z" Closure leaving primary rib verical.
3. Field cut "Z" Closures to fit panel width.
4. Clip Back-Up Plate NFS-BP to end of panel.
5. Install LS-100 Tape Sealant to panels. The center of the Tape Sealant should be 1 1/2" from end of panel.
6. Install "Z" Closures to panels and back-up plate with Pop Rivet PR1 at 4" O.C. max. Vertical leg of "Z" Closure should be 4" from center of ridge.
7. Install LS-200 Tape Sealant at top of "Z" Closure.
8. Attach Ridge/Hip Flashing to "Z" Closure with RF3 at 12" O.C.

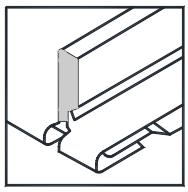
10.2 LOW SIDE EAVE TRIM DETAILS OVER WOOD DECK

FIXED EAVE WITH EAVE TRIM (3'-0" MAX CLIP SPACING)



OPTIONAL CONTINUOUS CLEAT NST-4





PANEL RIB END DETAIL

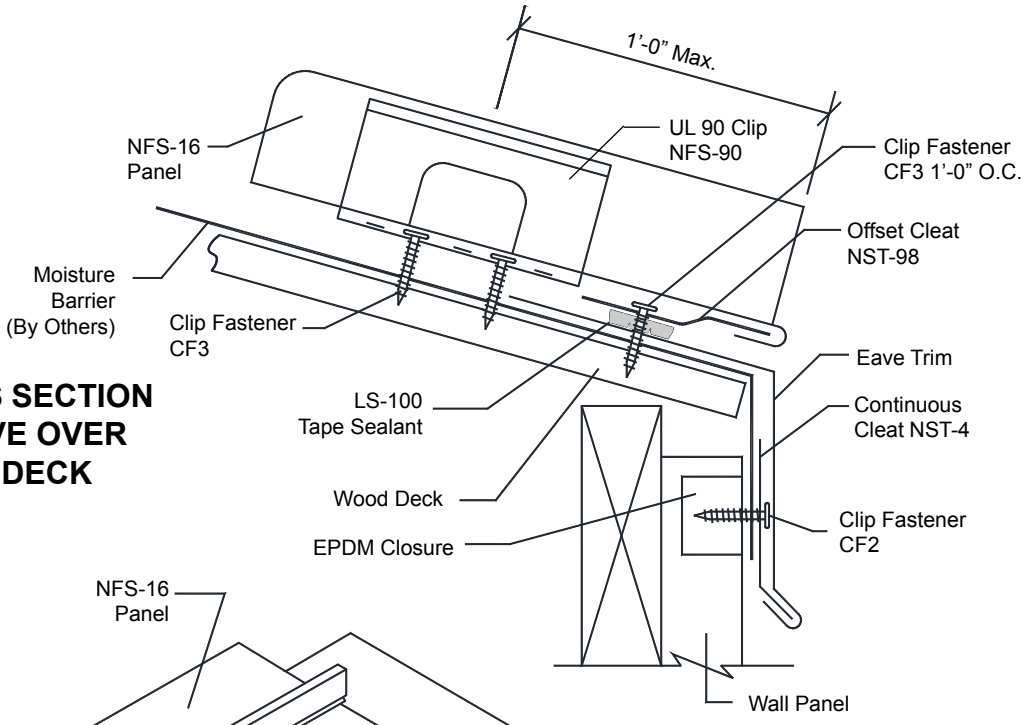
FIXED EAVE WITH GUTTER

NOTES:

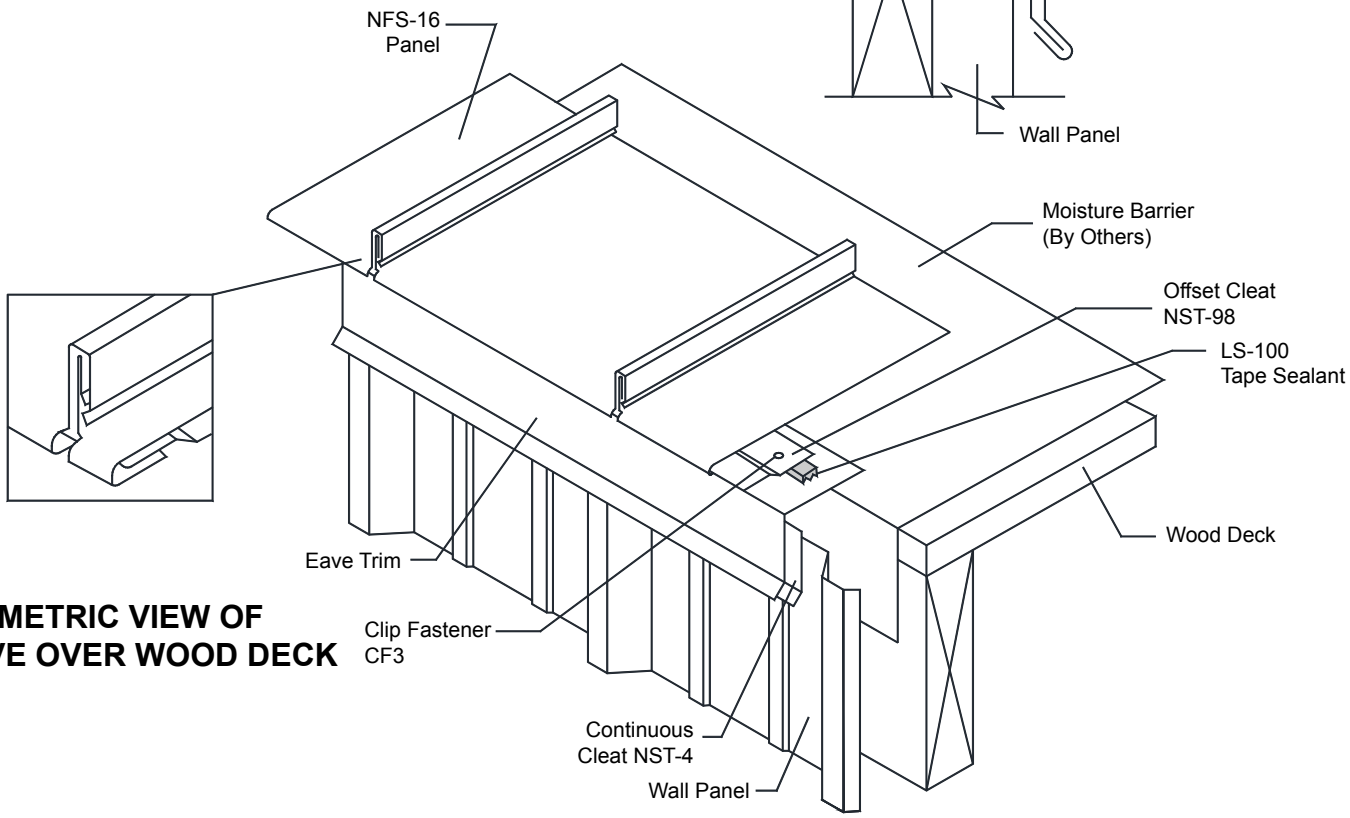
1. **Do not use this detail with fixed ridge or hip details.**
2. Attach eave trim or gutter to wood deck w/ Clip Fastener CF3 at 2'-0" O.C.
3. Apply LS-100 Tape Sealant to slope leg of gutter or eave trim.
4. Install panel and fastener to wood deck with Roof Fastener RF4 at 4" O.C. max.
5. **See "Panel Rib End Detail" on page 33 to seal panel rib ends at valley.**

10.2 LOW SIDE EAVE TRIM DETAILS OVER WOOD DECK

EAVE TRIM WITH OFFSET CLEAT (3'-0" MAX CLIP SPACING)



CROSS SECTION OF EAVE OVER WOOD DECK



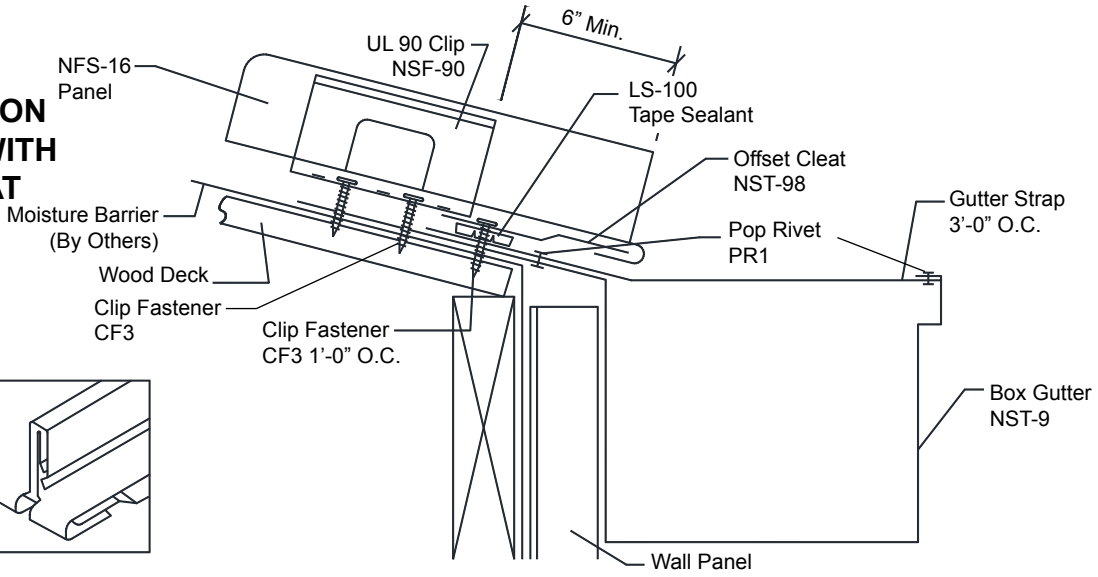
ISOMETRIC VIEW OF EAVE OVER WOOD DECK

NOTES:

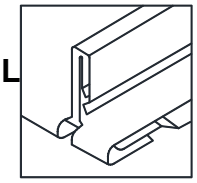
1. **Panels must be attached to substructure at the ridge or hip to prevent them from sliding downslope.**
2. Offset cleat is installed continuous along eave over LS-100 Tape Sealant with Clip Fastener CF3 at 12" O.C. **FASTENERS MUST GO THROUGH Tape Sealant.**
3. **Add 1 1/2" to the panel length for the panel hem.**
4. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends at valley.**
5. First UL-90 Panel Clip must be within 1'-0" of Eave end of panel.

10.2 LOW SIDE EAVE TRIM DETAILS OVER WOOD DECK
GUTTER DETAIL
(3'-0" MAX CLIP SPACING)

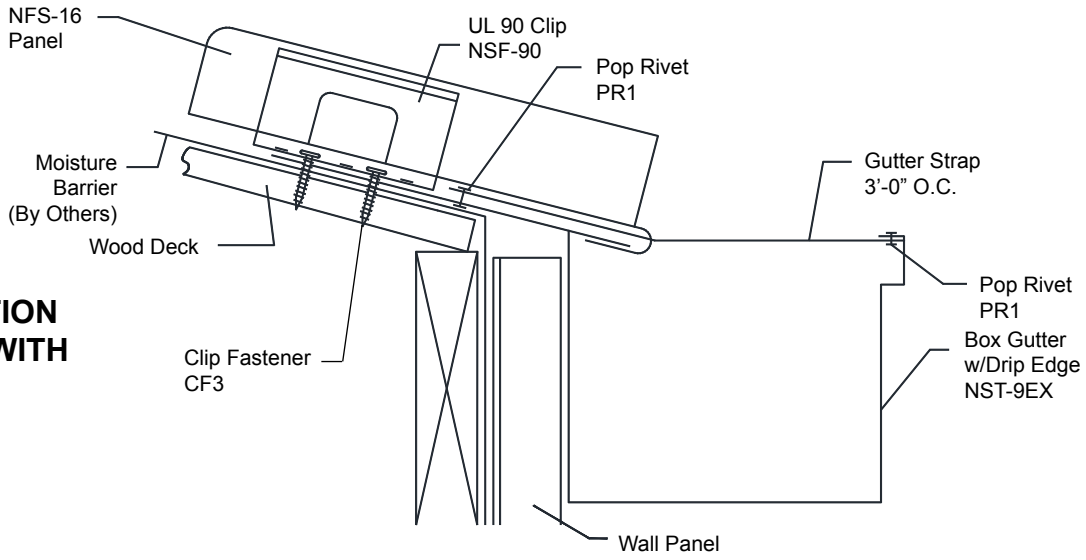
CROSS SECTION OF GUTTER WITH OFFSET CLEAT



PANEL RIB END DETAIL



CROSS SECTION OF GUTTER WITH DRIP EDGE



NOTES:

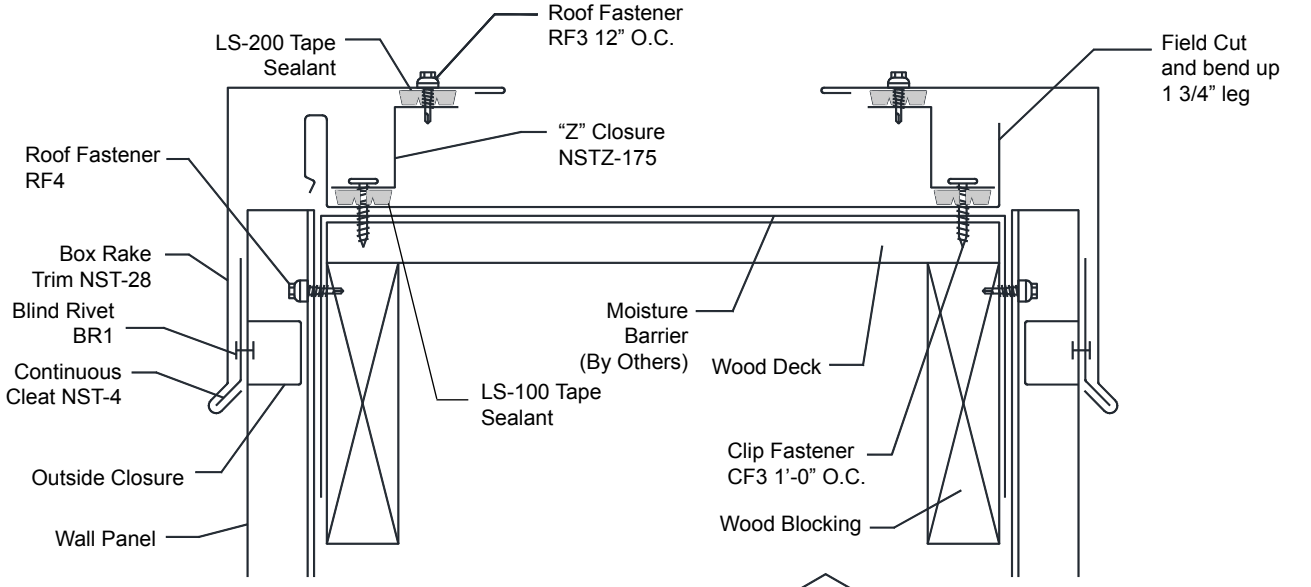
Offset Cleat

1. **The offset cleat method of attachment should be used when ridge or peak is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Attach offset cleat to wood deck with Clip Fastener CF3 at 1'-0" O.C.
3. To field hem panel, see page 34.
4. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends.**
5. The above gutter should not be used in areas that experience snow loads of 10 PSF or higher.

Gutter with Drip Edge

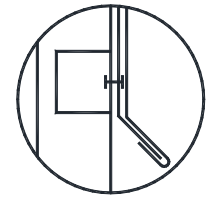
1. **The gutter with drip edge method of attachment should be used when ridge or peak is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Install gutter to wood deck with Clip Fastener CF3 at 2'-0" O.C.
3. Attach gutter straps to gutter with Pop Rivet PR1 at 3'-0" O.C.
4. To field hem panel, see page 34.
5. Notch panel hem for gutter strap.
6. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends.**
7. This detail may be used on roofs with pitches of 4:12 or less. For roofs with pitches greater than 4:12, call *Alliance Steel, Inc.*
8. The above gutter should not be used in areas that experience snow loads of 10 PSF or higher.

10.3 GABLE TRIM DETAILS OVER WOOD DECK
FIXED RAKE
(3'-0" MAX CLIP SPACING)

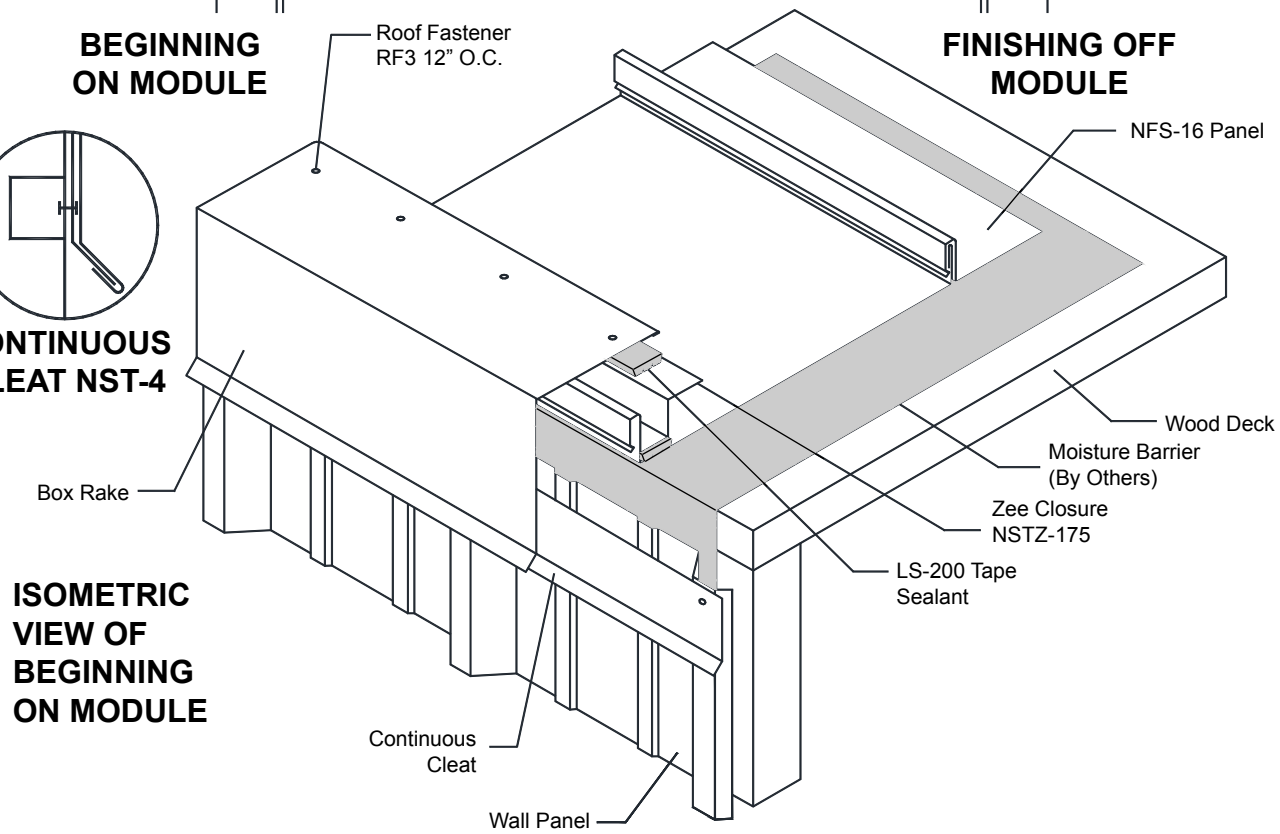


BEGINNING ON MODULE

FINISHING OFF MODULE



CONTINUOUS CLEAT NST-4

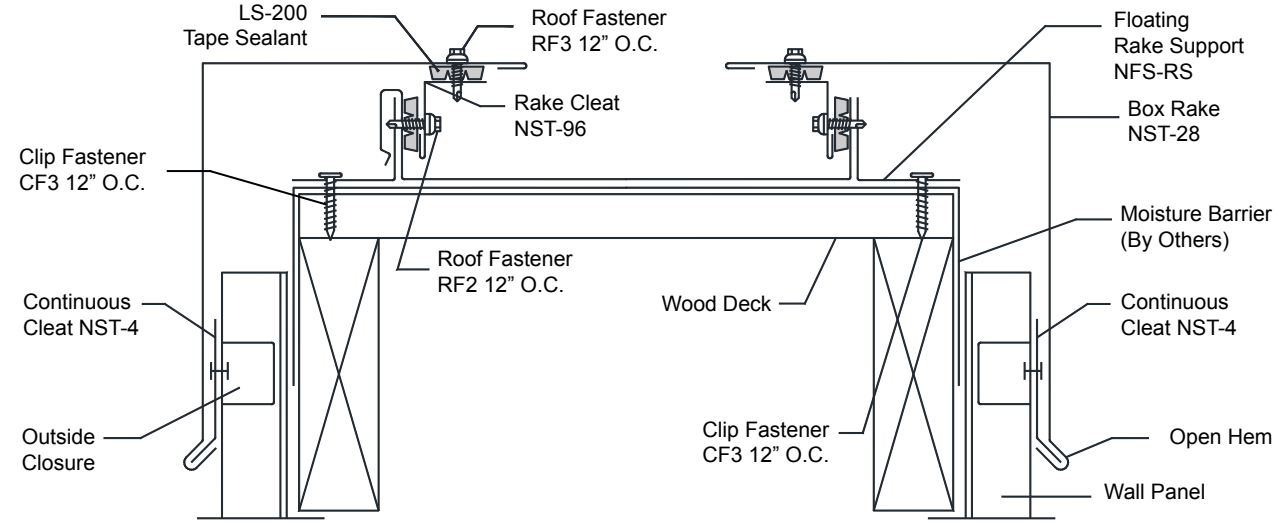


ISOMETRIC VIEW OF BEGINNING ON MODULE

NOTES:

1. Apply LS-100 Tape Sealant to bottom leg of zee closure.
2. Install zee closure to panel with Clip Fastener CF3 1'-0" O.C.
3. Apply LS-200 Tape Sealant to top leg of zee closure and attach rake trim to zee closure with Roof Fastener RF3 at 12" on center.
4. If roof finishes on module, finish detail will be similar to starting detail. If roof finishes off module, field cut panel and bend a 1 3/4" leg before installing zee closure.

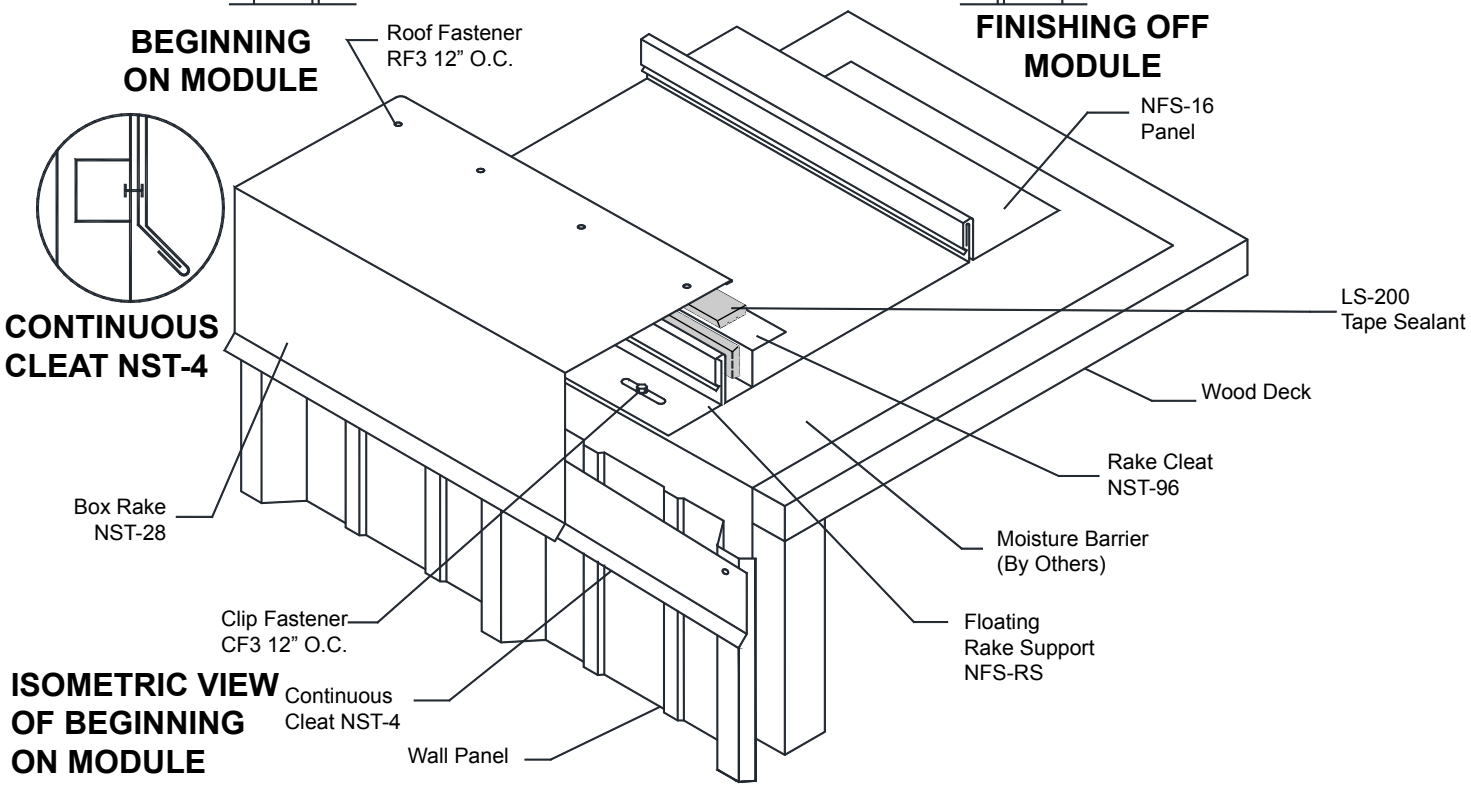
10.3 GABLE TRIM DETAILS OVER WOOD DECK
FLOATING GABLE TRIM
(3'-0" MAX CLIP SPACING)



BEGINNING ON MODULE

FINISHING OFF MODULE

CONTINUOUS CLEAT NST-4



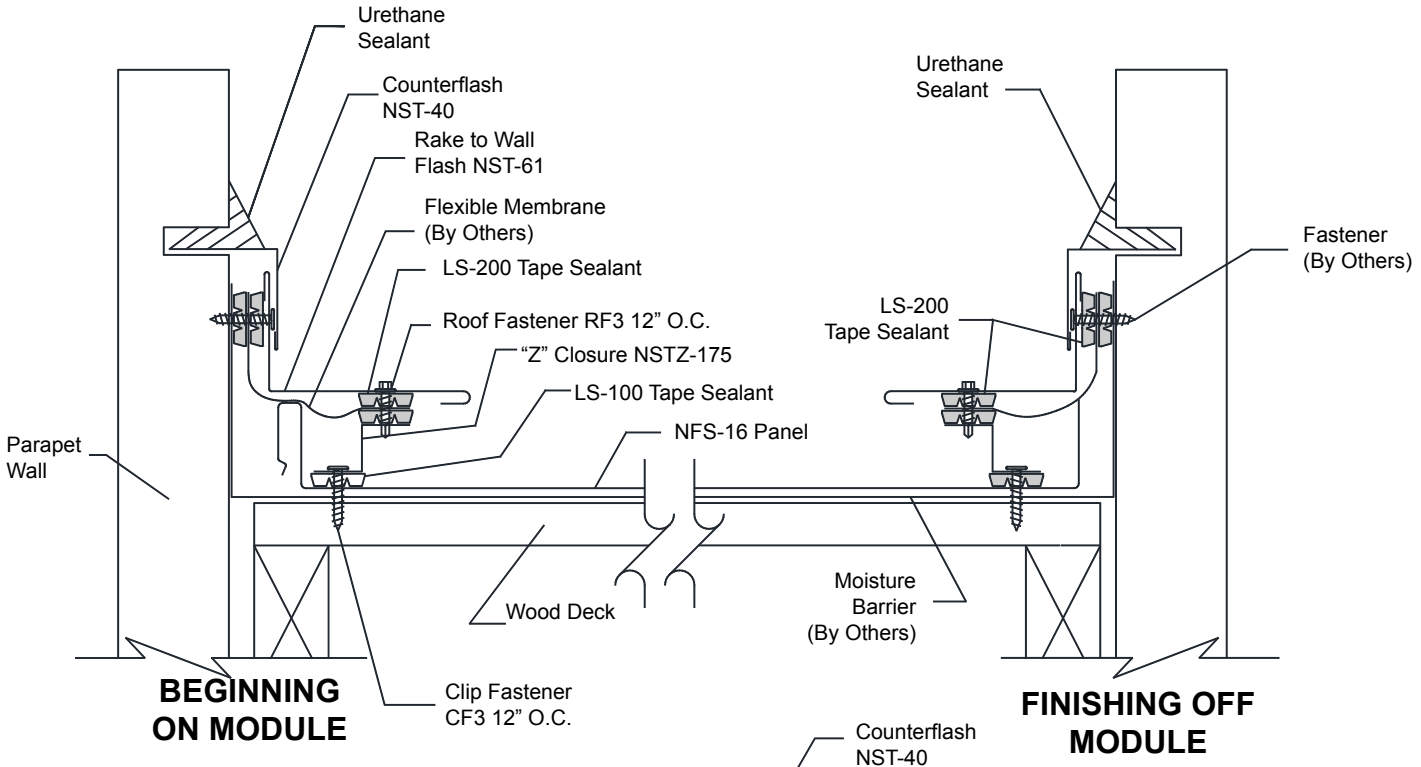
ISOMETRIC VIEW OF BEGINNING ON MODULE

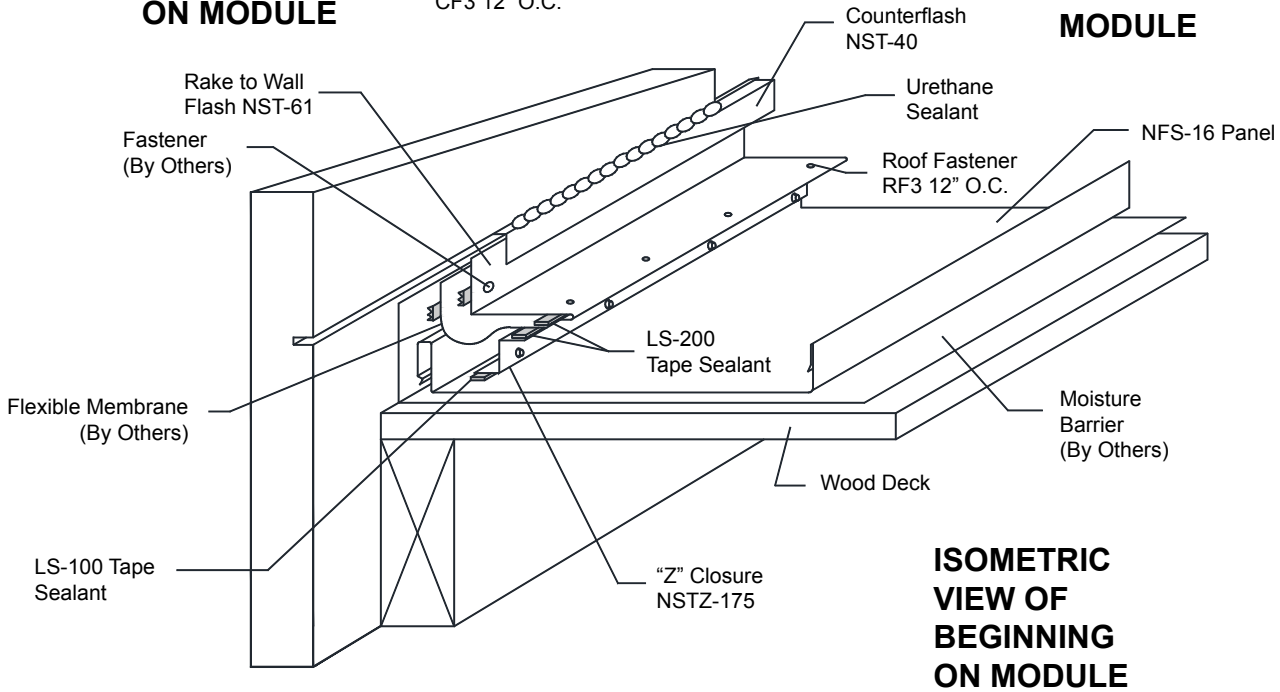
NOTES:

1. The top dimension of the rake will be affected by the wall panel thickness
2. Install floating rake support with Clip Fastener CF3 at 12" O.C. (Install Clip Fastener CF3 so as not to restrict the movement os the rake support).
3. Engage female leg of panel over rake support.
4. Apply LS-200 Tape Sealant to vertical leg of panel. Install rake cleat to panel leg with Roof Fastener RF2 at 12" O.C. **FASTENERS MUST GO THROUGH RAKE SUPPORT.**
5. Apply LS-200 Tape Sealant to top of rake cleat and attach rake trim to rake cleat with Roof Fastener RF3 at 12" O.C.
6. Use continuous cleat to hold bottom of rake trim in place. Fasten continuous cleat to each high rib of wall panel. The bottom hem of the rake trim is "open".
7. If roof finishes on module, finishing detail will be similar to starting detail. If roof finishes off module, field cut and bend last panel run to fit against floating rake support. Install rake cleat, Tape Sealant and rake trim as previously described.
8. If rake trim is not to be immediatly installed, temporarily fasten panels to rake support to prevent wind damage.

10.4 ROOF TO WALL TRANSITION TRIM DETAILS OVER WOOD DECK

FIXED RAKE TO WALL
(3'-0" MAX CLIP SPACING)





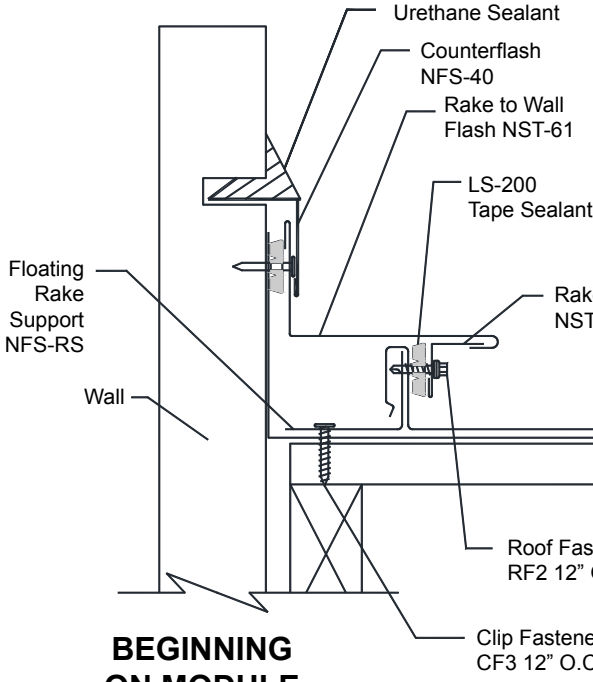
NOTES:

1. Apply LS-100 Tape Sealant to panel.
2. Install "Z" Closure to panel with Clip Fastener CF3 at 12" O.C.
3. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
4. Attach flexible membrane to LS-200 Tape Sealant on top of "Z" Closure and add a second run of LS-200 Tape Sealant on top of the flexible membrane.
5. Attach Rake to Wall Flash to "Z" Closure with Roof Fastener RF3 at 12" O.C.
6. If roof finishes on module, finish detail will be similar to starting detail. If roof finishes off module, field cut panel and bend a 1 3/4" leg before installing zee closure.

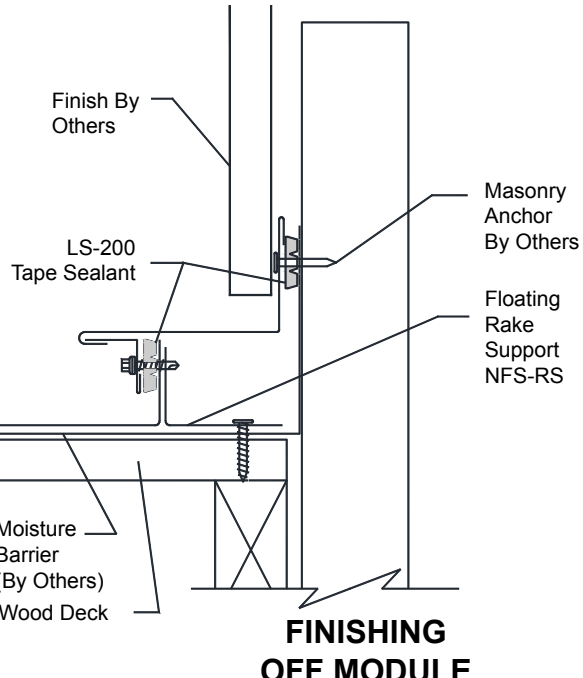
10.4 ROOF TO WALL TRANSITION TRIM DETAILS OVER WOOD DECK

FLOATING RAKE TO WALL (3'-0" MAX CLIP SPACING)

SAWCUT DETAIL (RECOMMENDED)

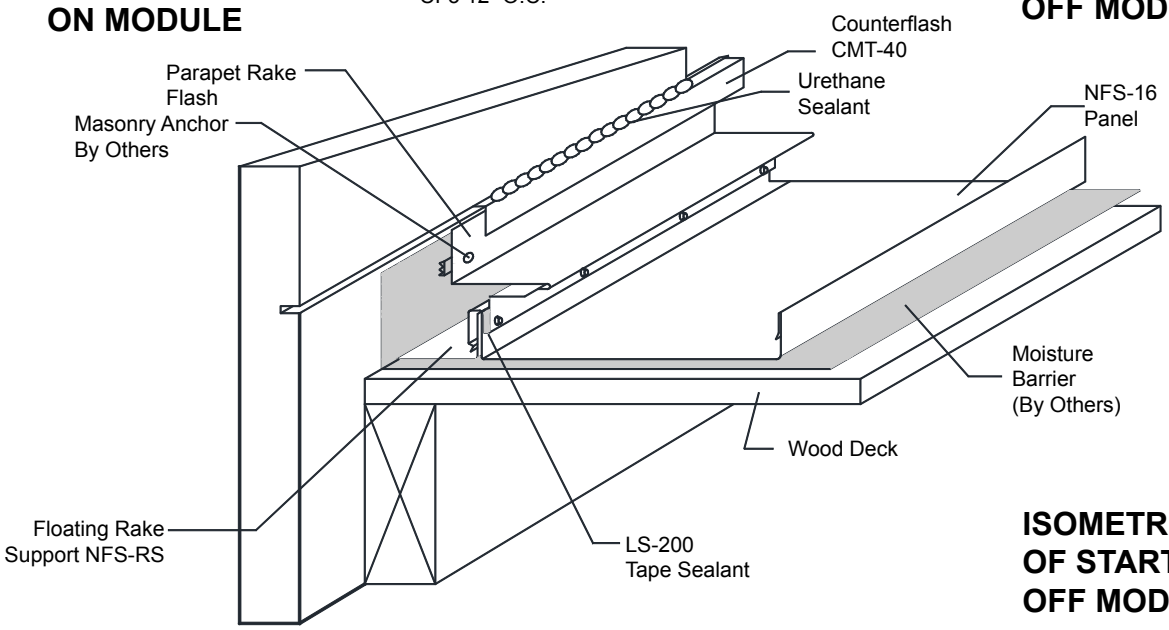


SURFACE MOUNT DETAIL



BEGINNING ON MODULE

FINISHING OFF MODULE

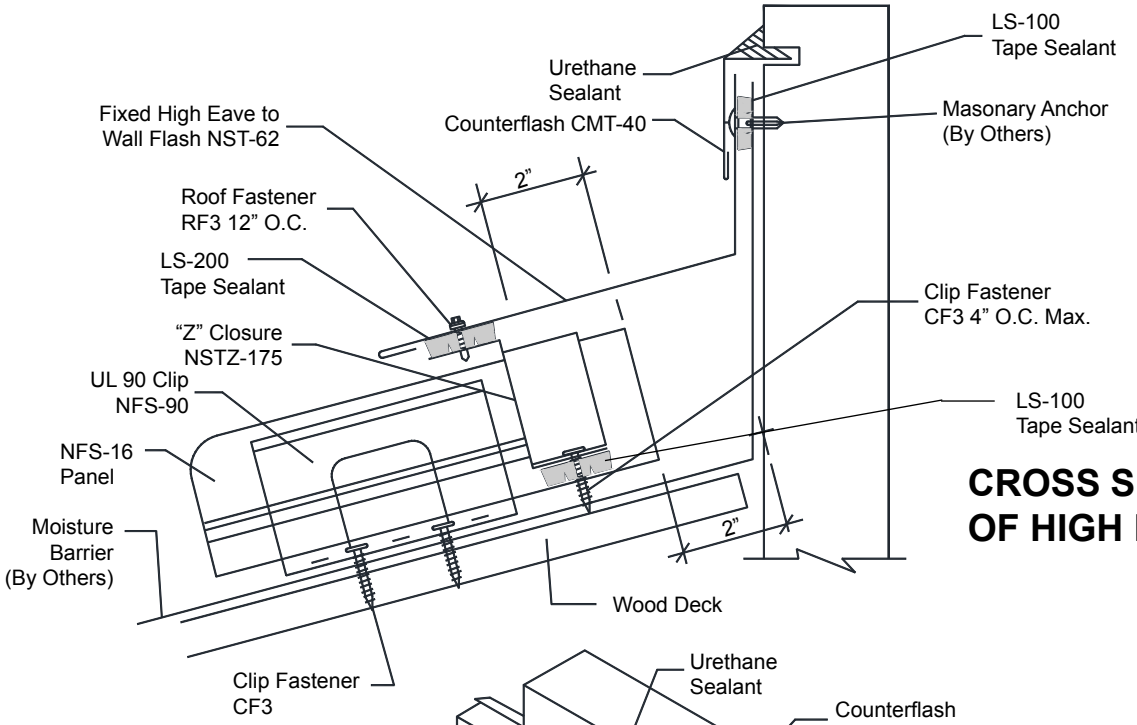


ISOMETRIC VIEW OF STARTING OFF MODULE

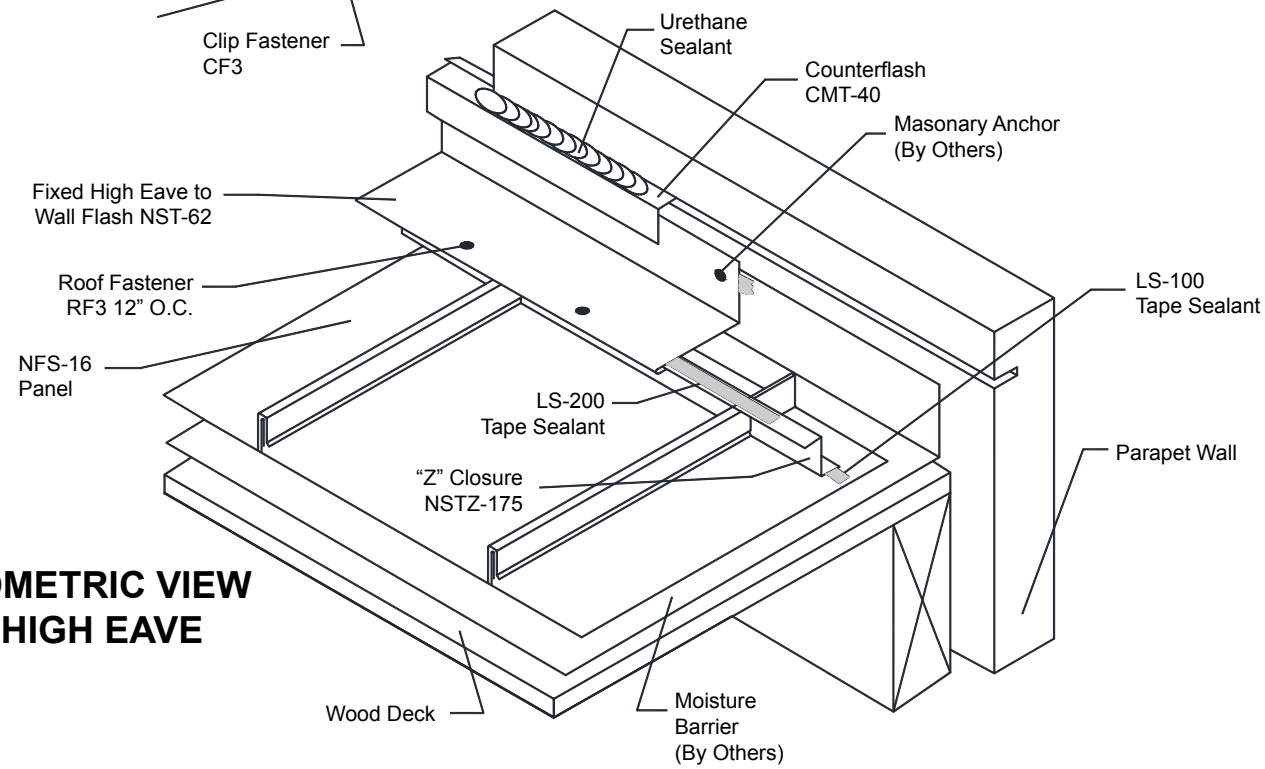
NOTES:

1. Install floating rake support with Clip Fastener CF3 at 12" O.C. (Install Clip Fastener CF3 so as not to restrict the movement of the rake support).
2. Engage female leg of panel over rake support.
3. Apply LS-200 Tape Sealant to vertical leg of panel. Install parapet rake cleat to panel leg with Roof Fastener RF2 at 12" O.C. **FASTENERS MUST GO THROUGH RAKE SUPPORT.**
4. Engage open hem of rake to wall flash onto rake cleat and fasten top leg to parapet wall with masonry anchor (by others).
5. If roof finishes on module, finishing detail will be similar to starting detail. If roof finishes off module, field cut and bend last panel run to fit against floating rake support. Install rake cleat, Tape Sealant and Rake to Wall Flash as previously described.
6. If rake to wall flash is not to be immediatly installed, temporarily fasten panels to rake support to prevent wind damage.

10.4 ROOF TO WALL TRANSITION TRIM DETAILS OVER WOOD DECK
FIXED HIGH EAVE TO WALL
(3'-0" MAX CLIP SPACING)



CROSS SECTION OF HIGH EAVE

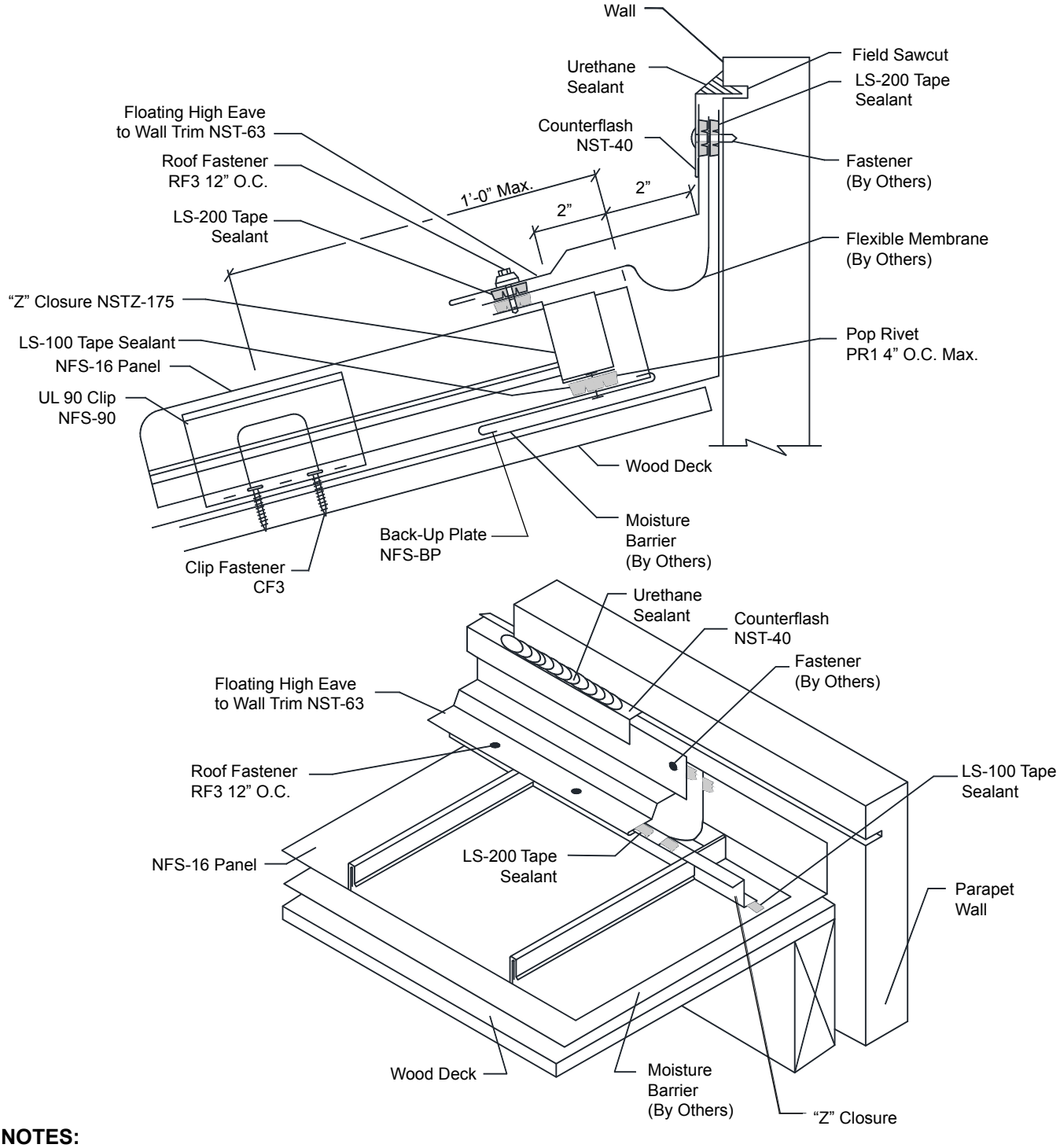


ISOMETRIC VIEW OF HIGH EAVE

NOTES:

1. **Do not use a fixed high eave detail with fixed eave or valley details.**
2. Field cut "Z" Closures to fit panel width.
3. Notch panel rib for "Z" Closure leaving primary rib verical.
4. Apply LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
5. Install "Z" Closures to panels with Clip Fastener CF3 at 4" O.C. max. Vertical leg of "Z" Closures should be 2" from end of panels.
6. Apply LS-200 Tape Sealant to the top leg of "Z" Closures.
7. Attach high eave to wall flash to "Z" Closure with Roof Fastener RF3 at 12" O.C.
8. Seal counterflash to wall with urethane sealant.

10.4 ROOF TO WALL TRANSITION TRIM DETAILS OVER WOOD DECK
FLOATING HIGH EAVE TO WALL
(3'-0" MAX CLIP SPACING)

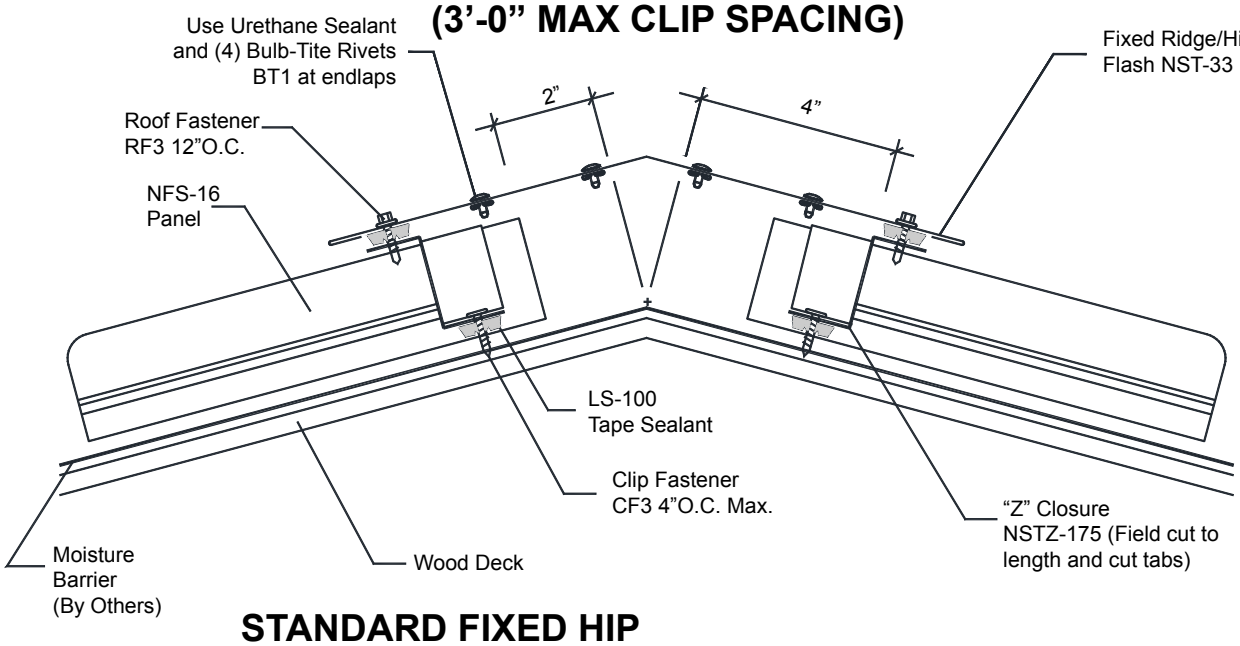


NOTES:

1. **Use this detail with fixed eave or valley details.**
2. Field cut "Z" Closures to fit panel width.
3. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
4. Install "Z" Closures to panels & Back-Up Plate with Pop Rivet PR1 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel.
5. Install LS-200 Tape Sealant to top leg of "Z" Closure.
6. Attach High Eave to Wall Trim to "Z" Closure with Roof Fastener RF3 at 12" O.C.
7. Seal counterflash to wall with urethane sealant.

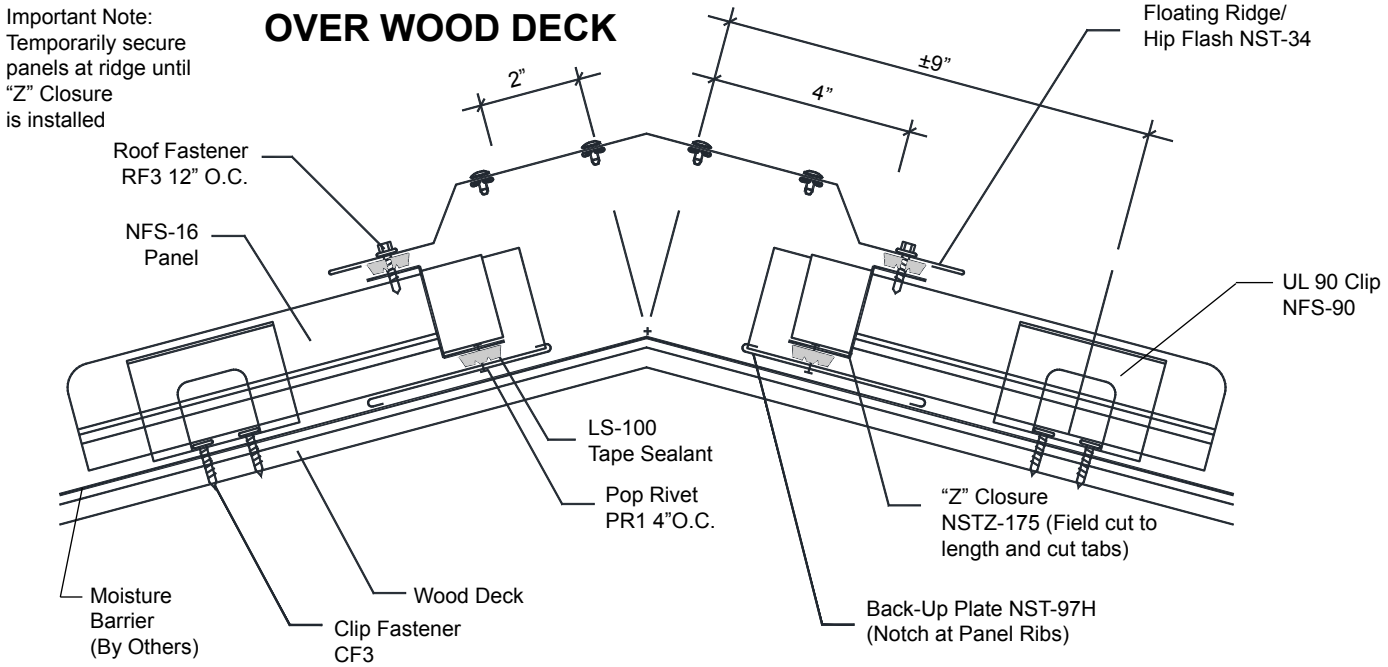
10.5 HIP AND VALLEY DETAILS OVER WOOD DECK

HIP DETAILS (3'-0" MAX CLIP SPACING)



STANDARD FIXED HIP OVER WOOD DECK

Important Note: Temporarily secure panels at ridge until "Z" Closure is installed



STANDARD FLOATING RIDGE/HIP OVER WOOD DECK

NOTES:

Fixed Hip

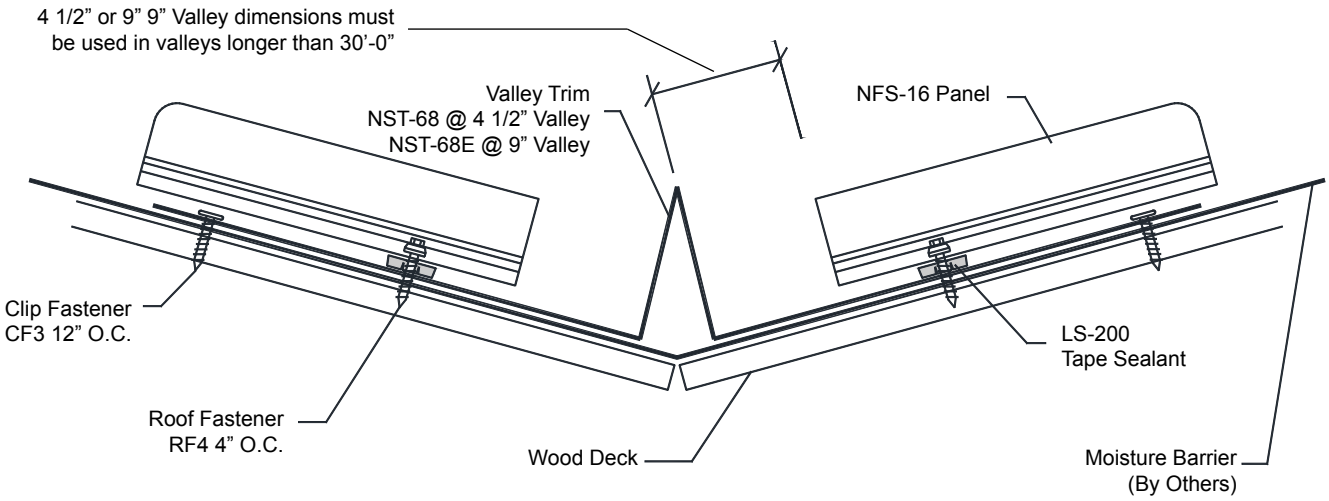
1. **Do not use a fixed hip detail with the fixed eave or valley details.**
2. Notch panel rib for "Z" Closure leaving primary rib vertical.
3. Bevel cut and install panels to follow slope of hip.
4. Install LS-100 Tape Sealant to panels, running parallel to the hip. Center of Tape Sealant should be 3 1/2" from the center of the hip.
5. Install "Z" Closures to panels with Clip Fastener CF3 at 4" O.C. max. Vertical leg of "Z" Closure should be 4" from the center of the hip.
6. Install LS-200 continuously at top of "Z" Closure & attach ridge/hip flashing with Roof Fastener RF3 12" O.C.

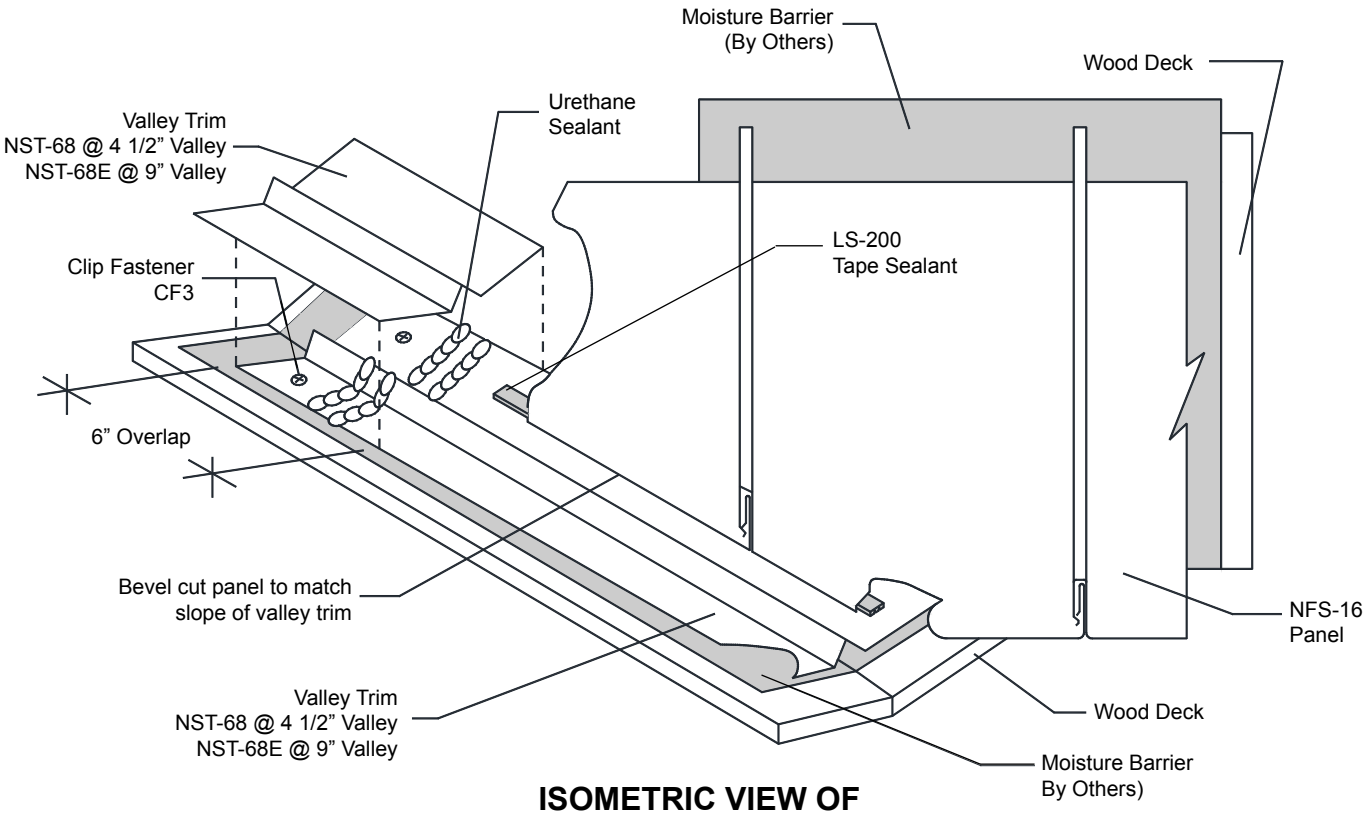
Floating Hip

1. **Do not use a floating ridge detail with the offset cleat method of attachment at the eave or valley.**
2. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
3. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
4. Install NFS-BP Back-Up Plates end to high end at panel end. Notch top lip of back-up plate at panel ribs.
5. Install "Z" Closures to panels and back-up plate with Pop Rivet PR1 at 4" O.C. Vertical leg of "Z" Closure should be 4" from center of ridge.
6. Install LS-200 Tape Sealant continuously at top of "Z" Closure & attach ridge/hip flashing with Roof Fastener RF3 12" O.C.

10.5 HIP AND VALLEY DETAILS OVER WOOD DECK

FIXED VALLEY DETAILS
(3'-0" MAX CLIP SPACING)





ISOMETRIC VIEW OF
VALLEY OVER WOOD DECK

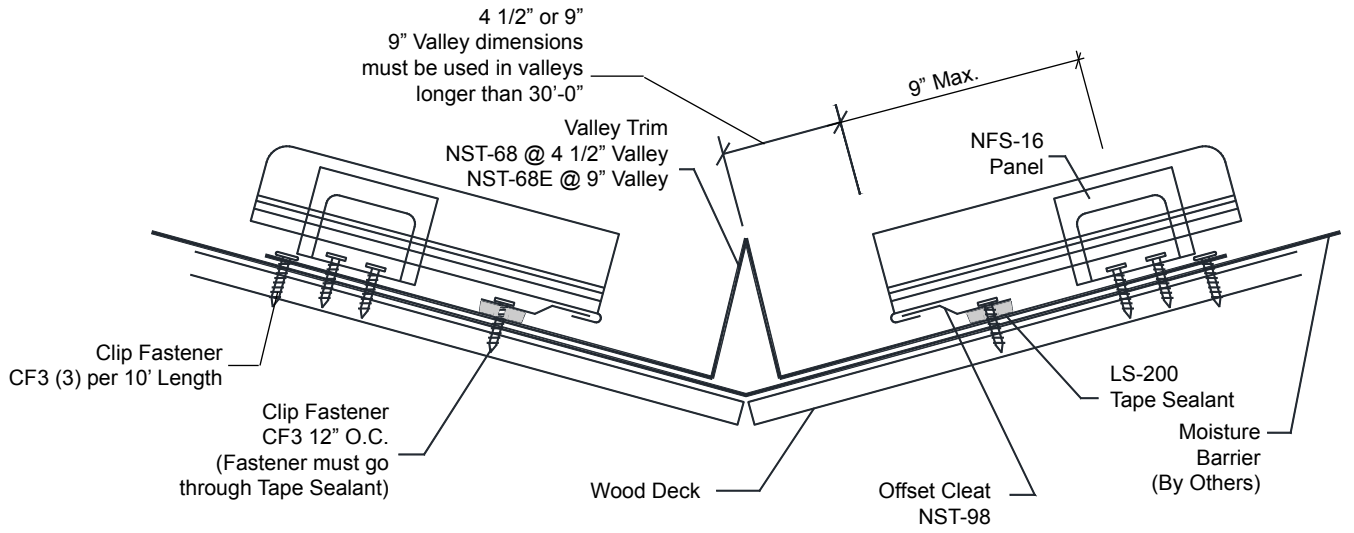
NOTES:

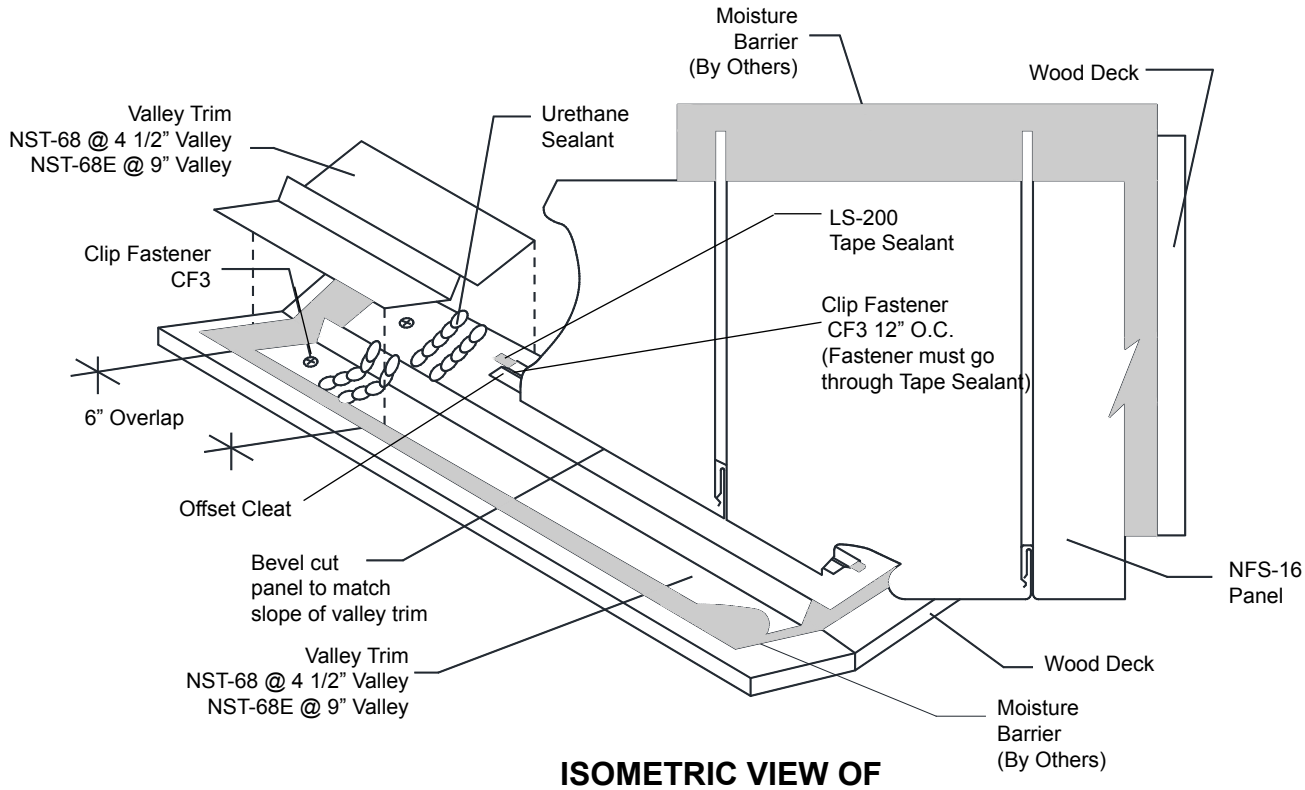
Standard Ridge Flash Conditions

1. For valleys longer than 30'-0", use extended valley trim.
2. **Do not use a fixed valley detail with fixed ridge or hip details.**
3. Apply LS-200 Tape Sealant continuously under NFS-16 Panel.
4. Attach panels to wood deck with Roof Fastener RF4 at 4" O.C. Max.
5. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends at valley.**

10.5 HIP AND VALLEY DETAILS OVER WOOD DECK

FLOATING VALLEY DETAILS
(3'-0" MAX CLIP SPACING)





ISOMETRIC VIEW OF
VALLEY OVER WOOD DECK

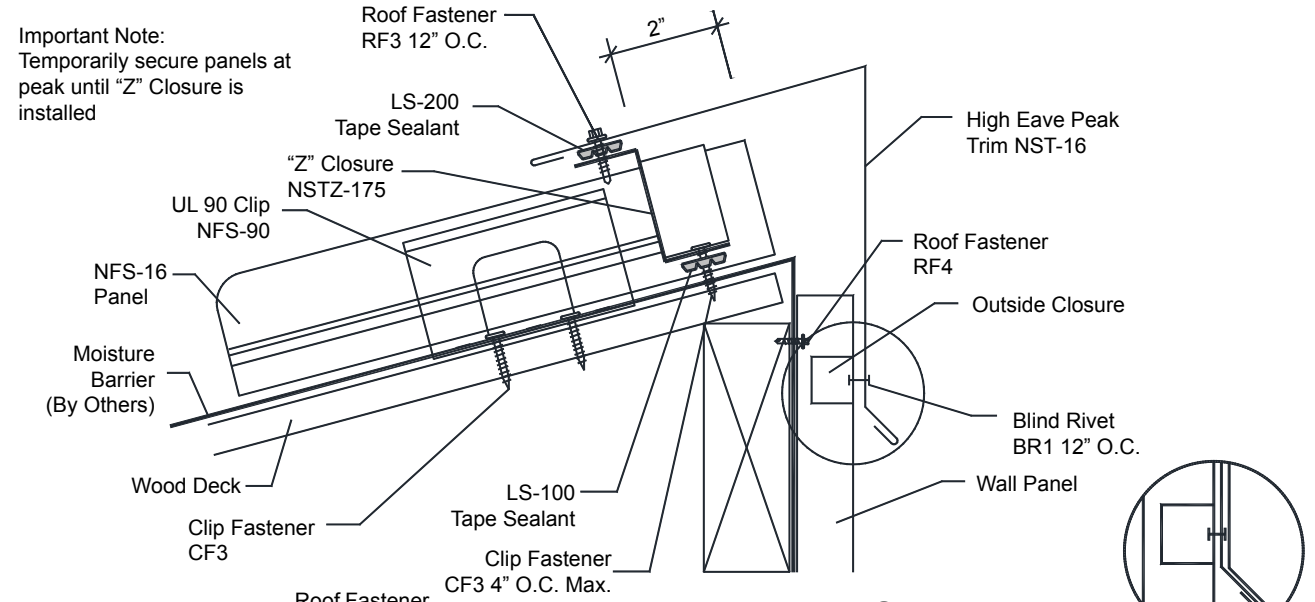
NOTES:

Standard Ridge Flash Conditions

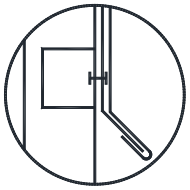
1. For valleys longer than 30'-0", use extended valley trim.
2. **Panels must be attached to substructure at the ridge or hip to prevent them from sliding downslope.**
3. Offset cleat is installed continuous along slope of valley over LS-200 Tape Sealant with Clip Fastener CF3 at 1'-0" O.C. **FASTENERS MUST GO THROUGH Tape Sealant.**
4. **Add 1 1/2" to the panel length fpr panel trim.**
5. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends at valley.**

10.6 HIGH SIDE EAVE TRIM DETAILS OVER WOOD DECK

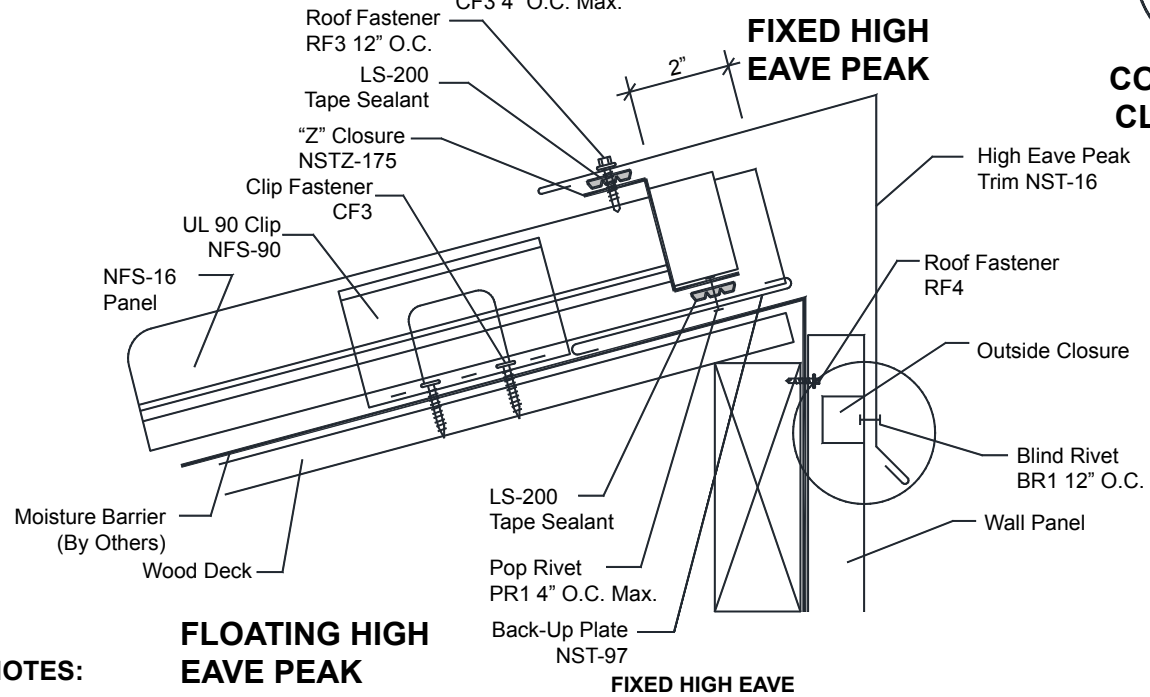
HIGH EAVE PEAK
(3'-0" MAX CLIP SPACING)



FIXED HIGH EAVE PEAK



CONTINUOUS CLEAT NST-4



FLOATING HIGH EAVE PEAK

NOTES:

FIXED HIGH EAVE

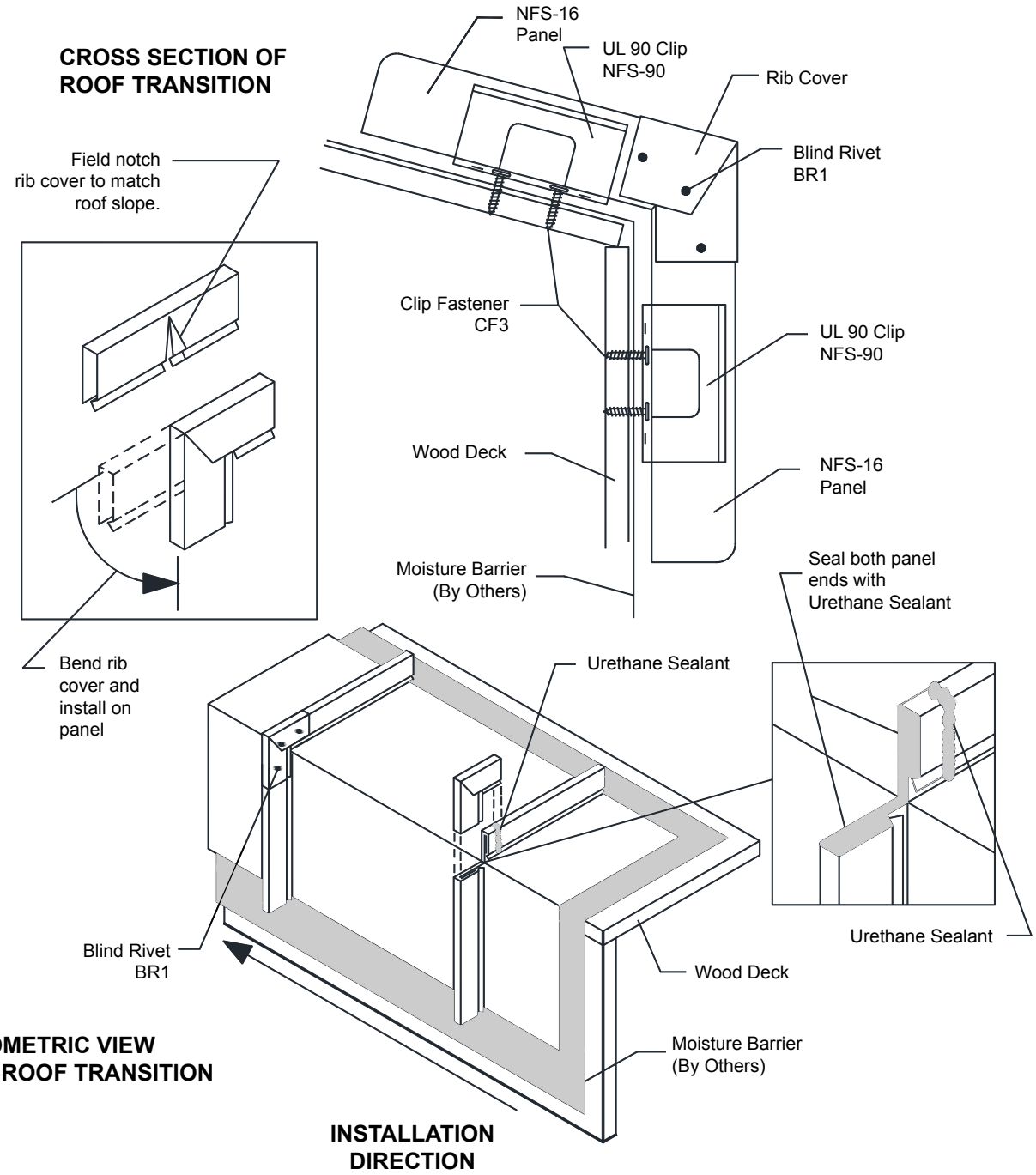
1. **Do not use a fixed high eave detail with fixed eave or valley details.**
2. Field cut "Z" Closures to fit panel width.
3. Notch panel rib for "Z" Closure leaving primary rib vertical.
3. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
4. Install "Z" Closures to panels with Clip Fastener CF3 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel.
5. Install LS-200 Tape Sealant to top leg of "Z" Closure.
6. Attach High Eave Peak Trim to "Z" Closure with Roof Fastener RF3 12" O.C.

FLOATING HIGH EAVE

1. **Do not use a floating high eave detail with offset cleat type eave or valley details.**
2. Field cut "Z" Closures to fit panel width.
3. Install LS-100 Tape Sealant to panels. Center of Tape Sealant should be 1 1/2" from end of panel.
4. Install "Z" Closures to panels & Back-Up Plate with Pop Rivet PR1 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel.
5. Install LS-200 Tape Sealant to top leg of "Z" Closure.
6. Attach High Eave Peak Trim to "Z" Closure with Roof Fastener RF3 at 12" O.C.

10.7 ROOF TRANSITION DETAILS OVER WOOD DECK

RIB COVER
(3'-0" MAX CLIP SPACING)

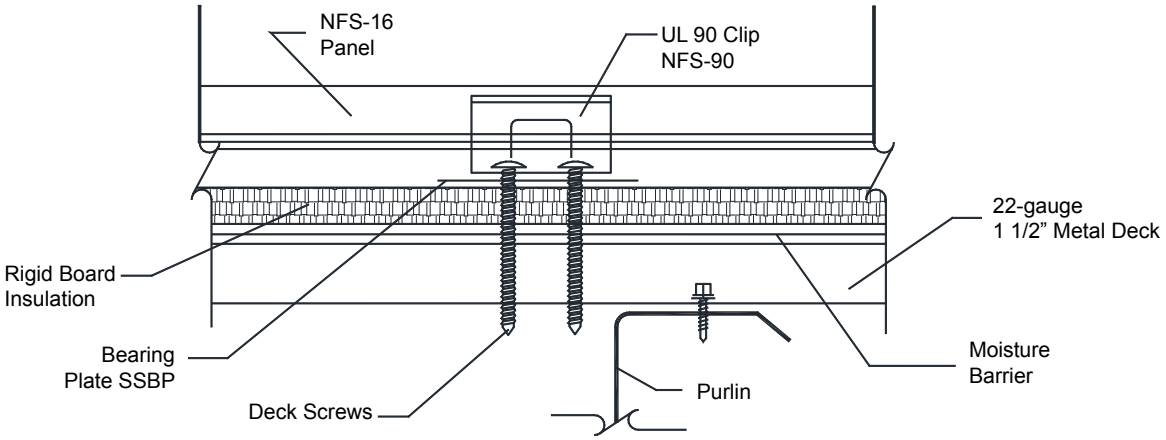


NOTES:

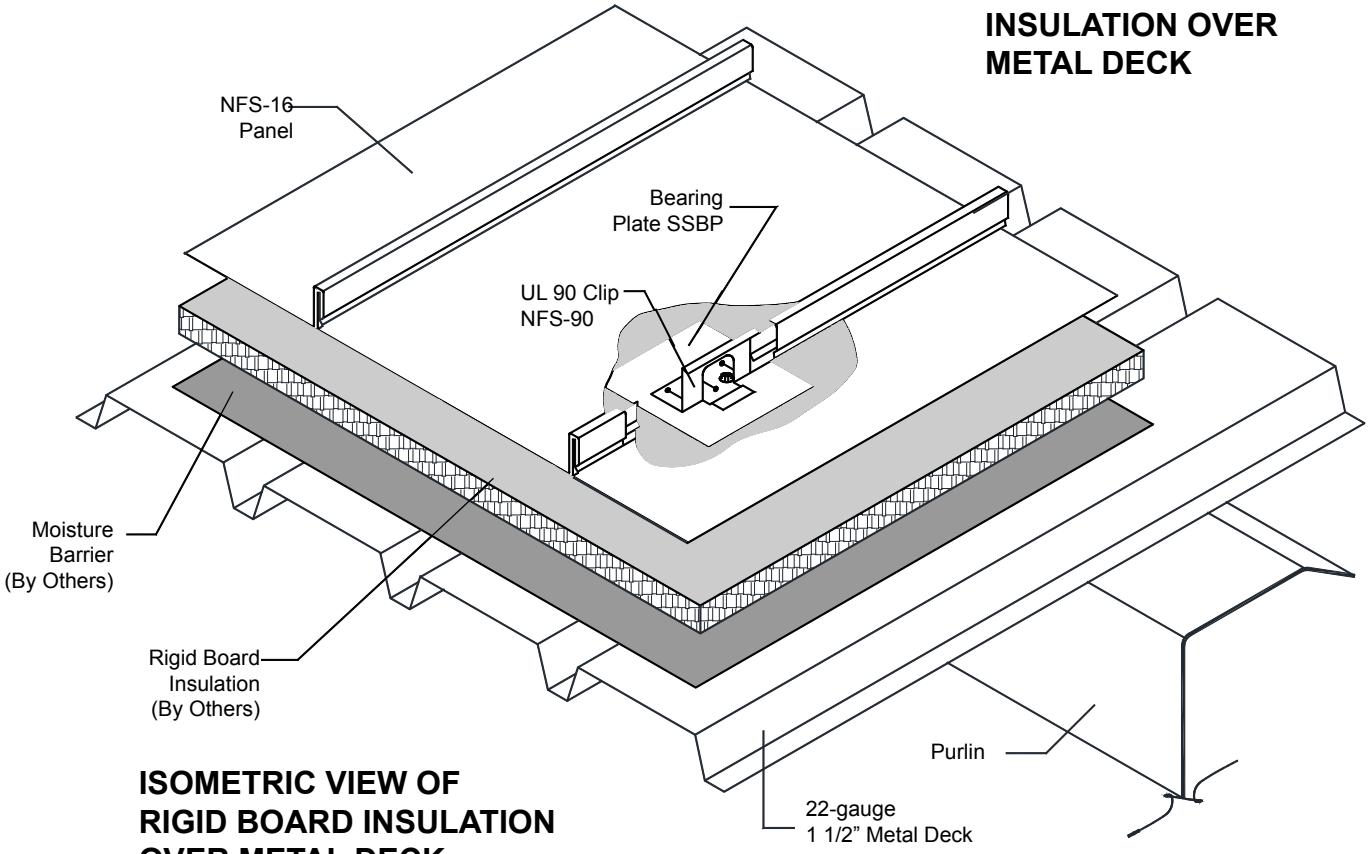
1. Do not use a fixed eave detail with the fixed ridge or hip details.
2. Field cut panels and bend to required angle.
3. Fill both exposed ends of panel with urethane sealant.
4. Field notch rib cover to allow it to bend to proper angle.
5. Field apply a bead of urethane sealant over rib before applying 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 over the building envelope.**

11.1 RIGID BOARD INSULATION OVER METAL DECK

RIGID BOARD INSULATION DETAIL



CROSS SECTION OF RIGID BOARD INSULATION OVER METAL DECK



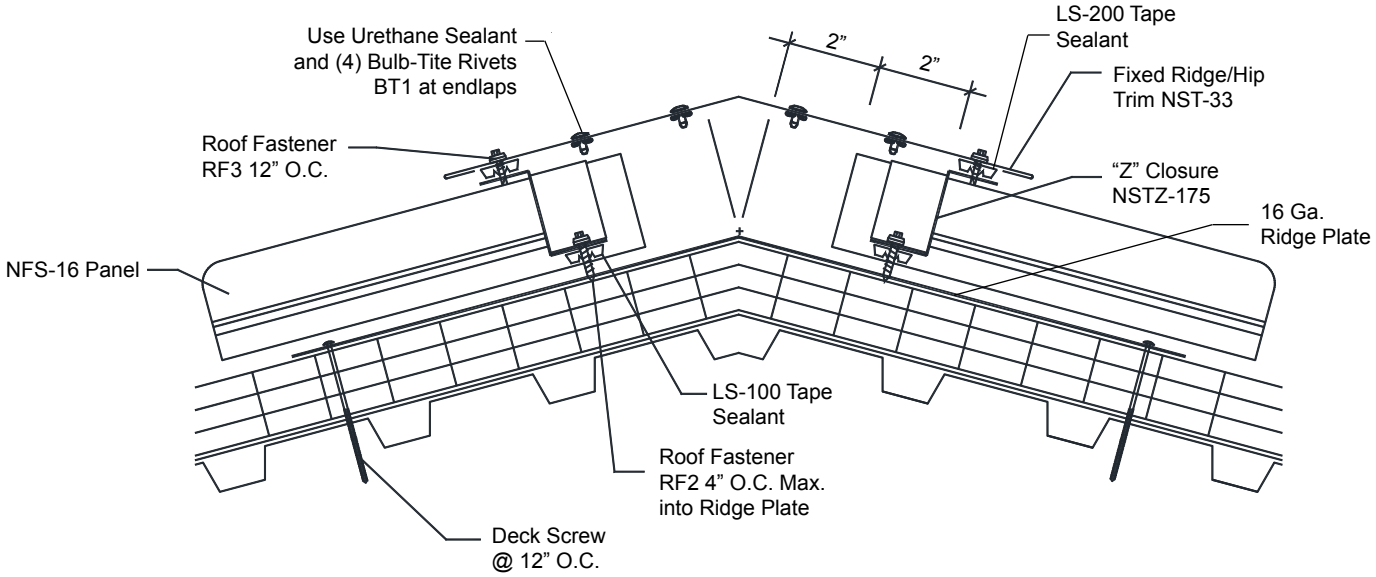
ISOMETRIC VIEW OF RIGID BOARD INSULATION OVER METAL DECK

NOTES:

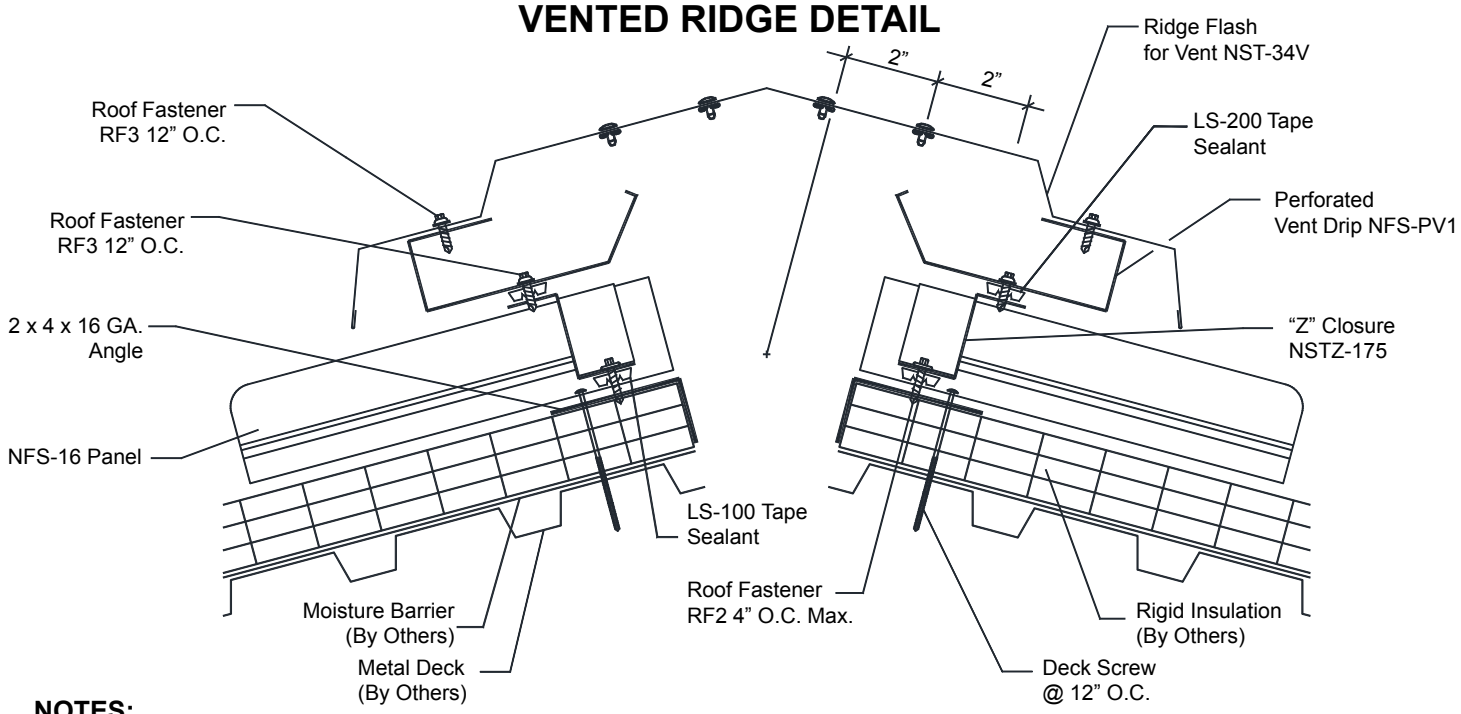
1. Metal deck to be 1 1/2" deep, 22 gauge.
2. Rigid board insulation to be 1" - 4" thick.
3. Clips and bearing plates to be installed simultaneously with two Deck Screws into the metal deck. Length of fasteners to be determined by thickness of insulation plus depth of metal deck. Fasteners should extend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

11.2 RIDGE CAP DETAILS OVER METAL DECK

FIXED RIDGE DETAIL



VENTED RIDGE DETAIL



NOTES:

FIXED RIDGE

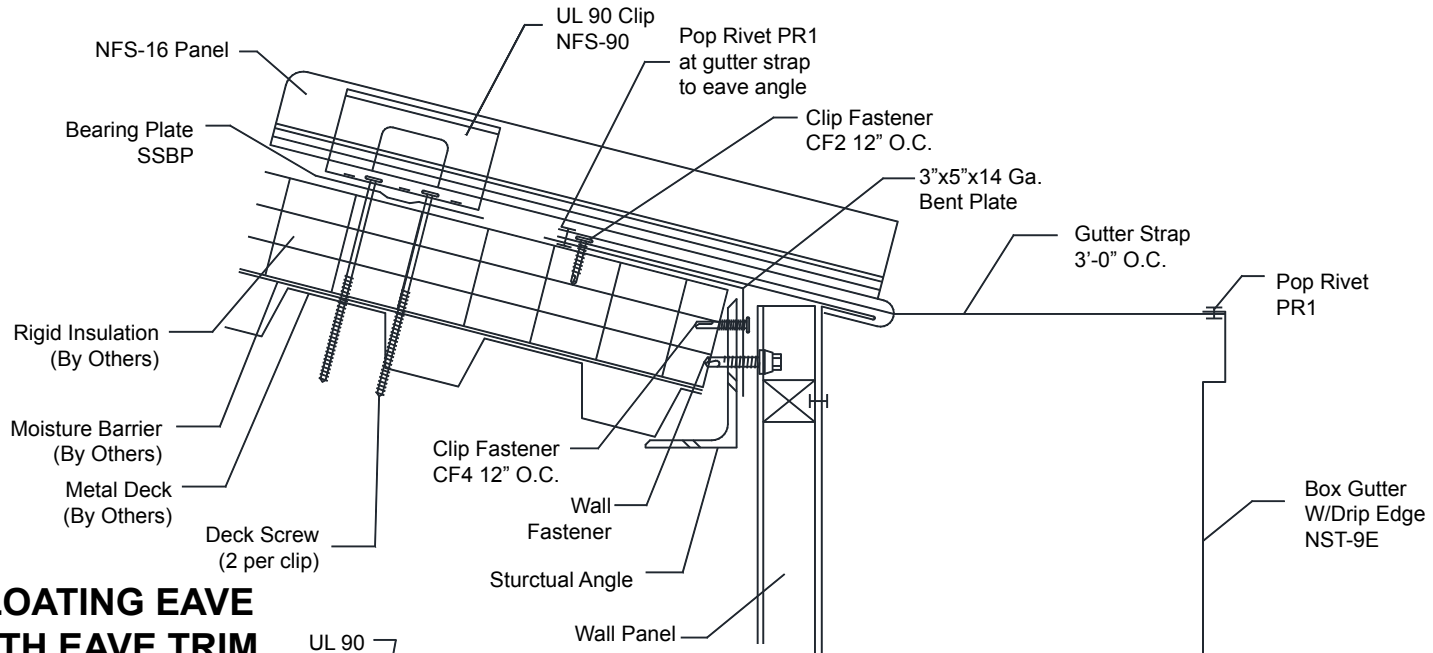
1. **Use this fixed ridge detail with a floating eave or valley detail.**
2. Notch Panel Ribs for "Z" Closure leaving primary rib vertical.
3. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
4. Install LS-100 Tape Sealant to panels. The center of the Tape Sealant should be 1 1/2" from end of panel.
5. Install "Z" Closures to panels with Roof Fastener RF2 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel.
6. Install LS-200 Tape Sealant to top leg of "Z" Closure.
7. Attach Ridge Flash to "Z" Closure with Roof Fastener RF3 at 12" O.C.

VENTED RIDGE

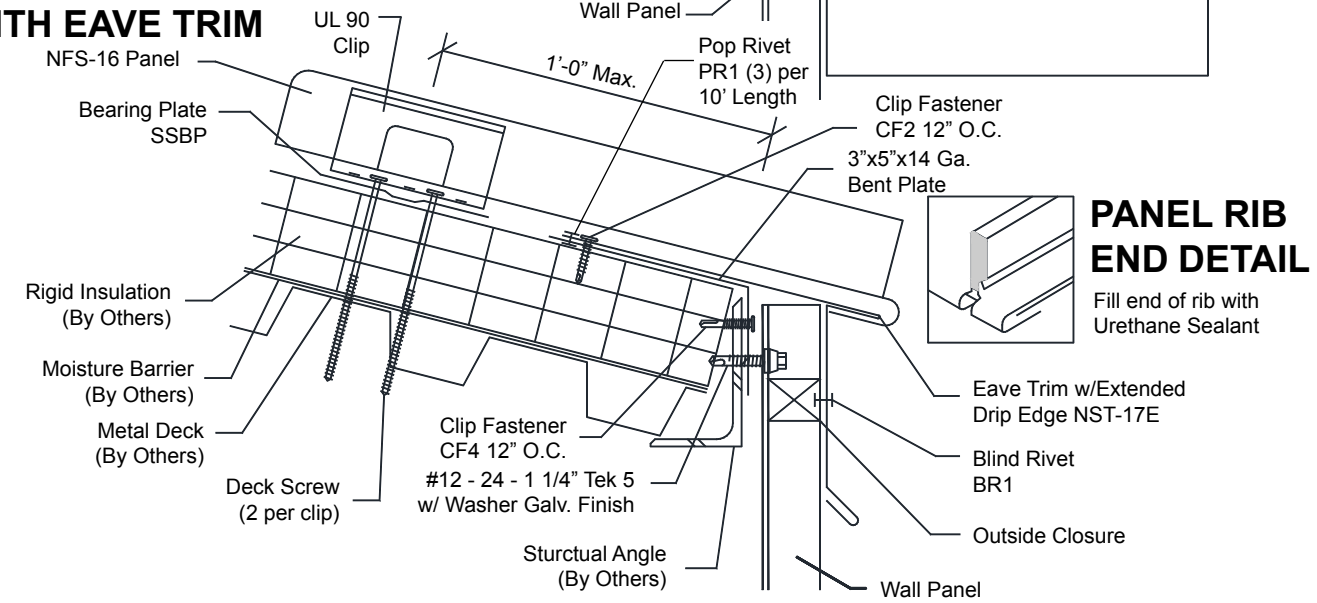
1. **Use this fixed ridge detail with the offset cleat method of attachment at the eave or valley.**
2. Vented ridge detail should be used in conjunction with soffit and/or eave vents to provide proper circulation and to prevent weather infiltration during high winds.
3. Install panel per notes 3 & 4 above.
4. Install and "Z" Closures to panels with Roof Fastener RF2 4" O.C. max. Install LS-200 Tape Sealant to top leg of "Z" Closure.
5. Attach Vent Drip to "Z" Closures with Roof Fastener RF3 at 12" O.C. Seal lap in vent drip with Urethane Sealant.
6. Attach Ridge Flash to Vent Drip with Roof Fastener RF3 at 12" O.C.

11.3 LOW SIDE EAVE TRIM DETAILS OVER METAL DECK

FLOATING EAVE WITH GUTTER



FLOATING EAVE WITH EAVE TRIM



PANEL RIB END DETAIL

Fill end of rib with Urethane Sealant

NOTES:

GUTTER TRIM

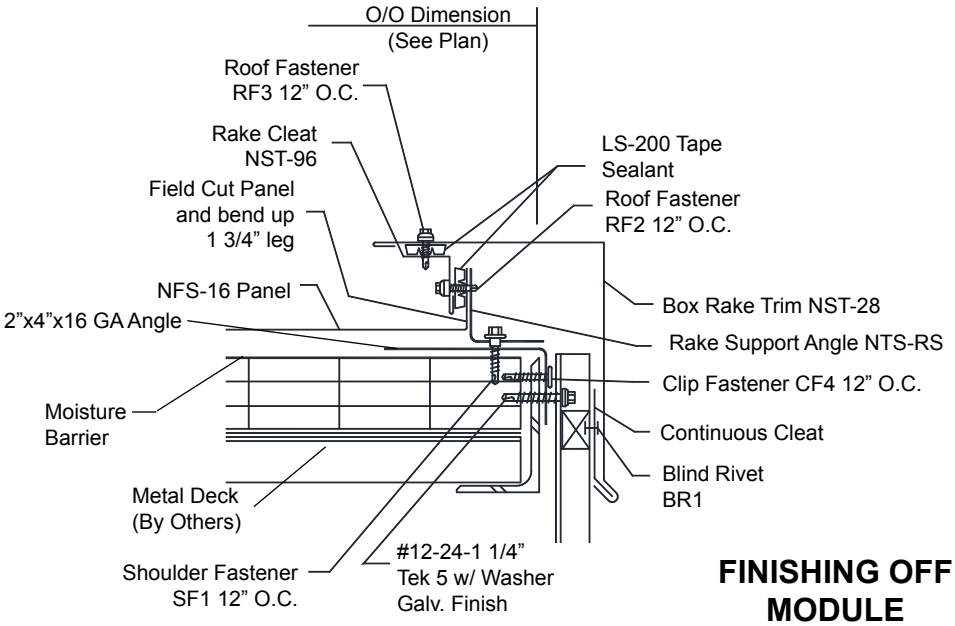
1. **The floating gutter detail should be used when ridge or high eave is fixed to the substructure. Panels must be attached at one of these points to prevent them from sliding downslope.**
2. Install eave angle with Clip Fastener CF4 at 12" O.C.
3. Attach gutter straps with Pop Rivet PR1 at 3'-0" O.C.
4. To field hem panel, see page 34
5. Notch panel hem for gutter strap.
6. **See "Panel Rib End Sealant Detail" on page 33 to seal panel rib ends.**
7. The above gutter should not be used in areas that experience snow loads of 10 PSF or higher.

EAVE TRIM

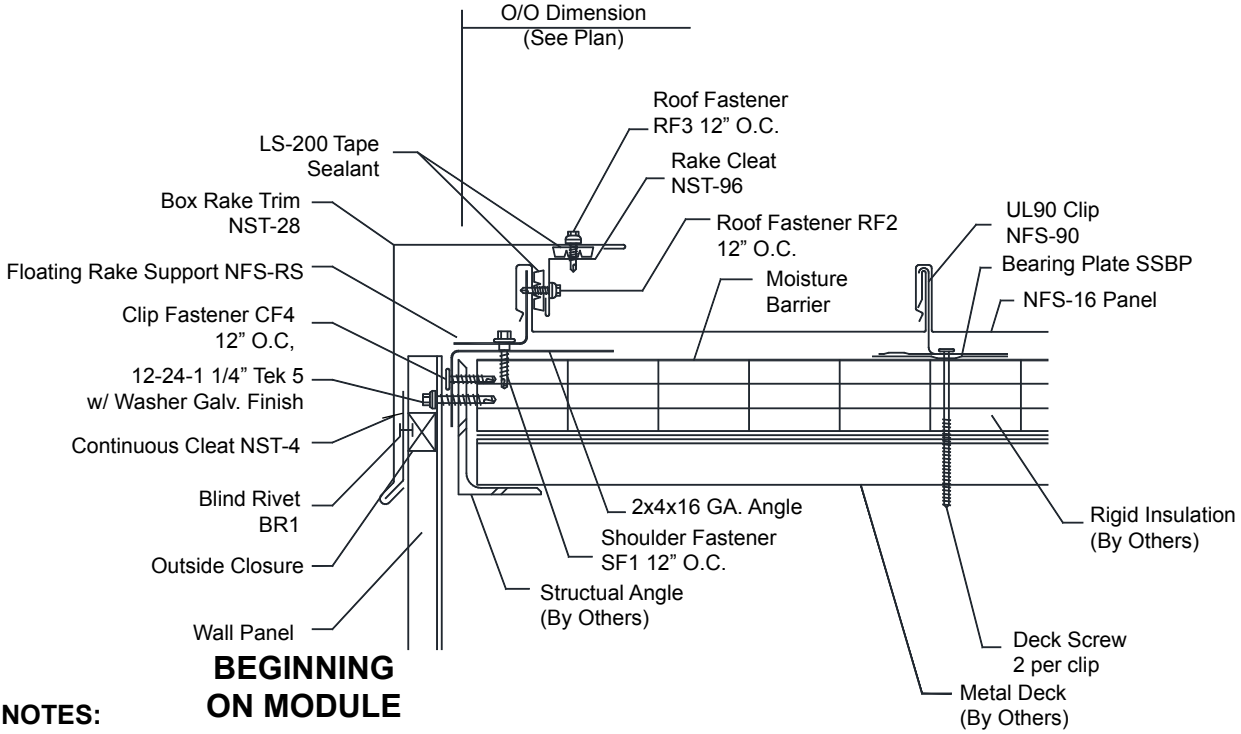
1. **Panels must be attached to the substructure at the ridge, high eave, or hip to prevent them from siding dowslope.**
2. Attach eave trim to bent plate at eave with Clip Fastener CF2 at 12" O.C.
3. To field hem panel, see page 34.
4. **Seal panel rib at eave end per detail.**

11.4 GABLE TRIM DETAILS OVER METAL DECK

FLOATING RAKE DETAIL



FINISHING OFF MODULE



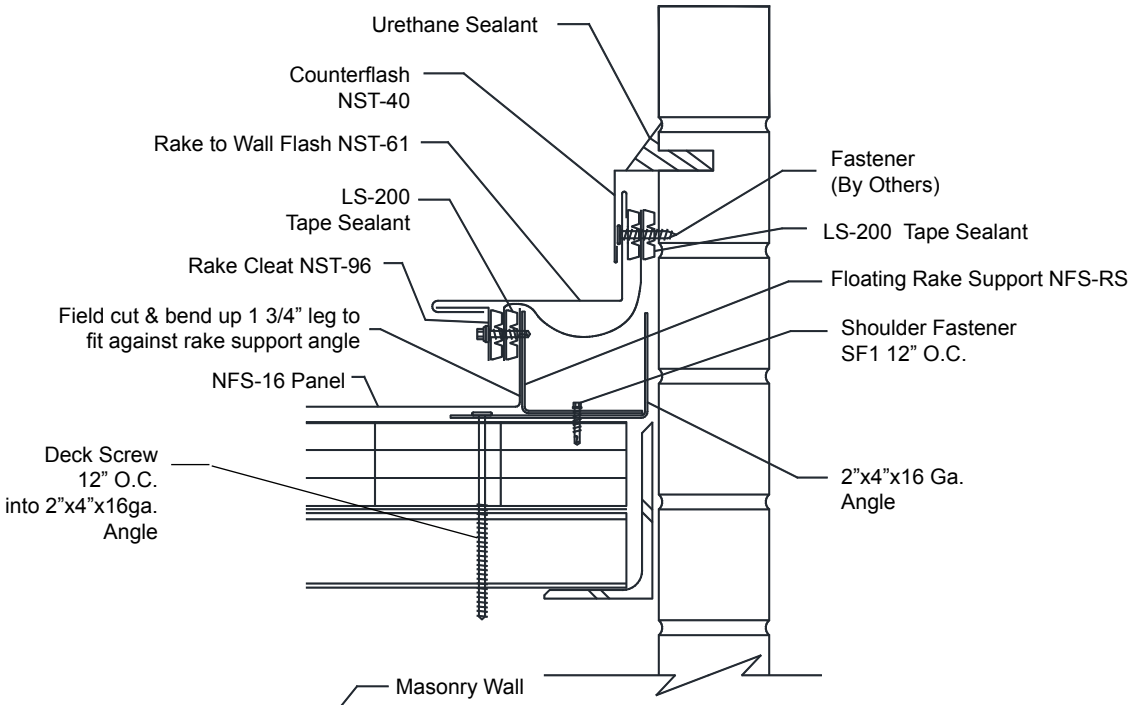
BEGINNING ON MODULE

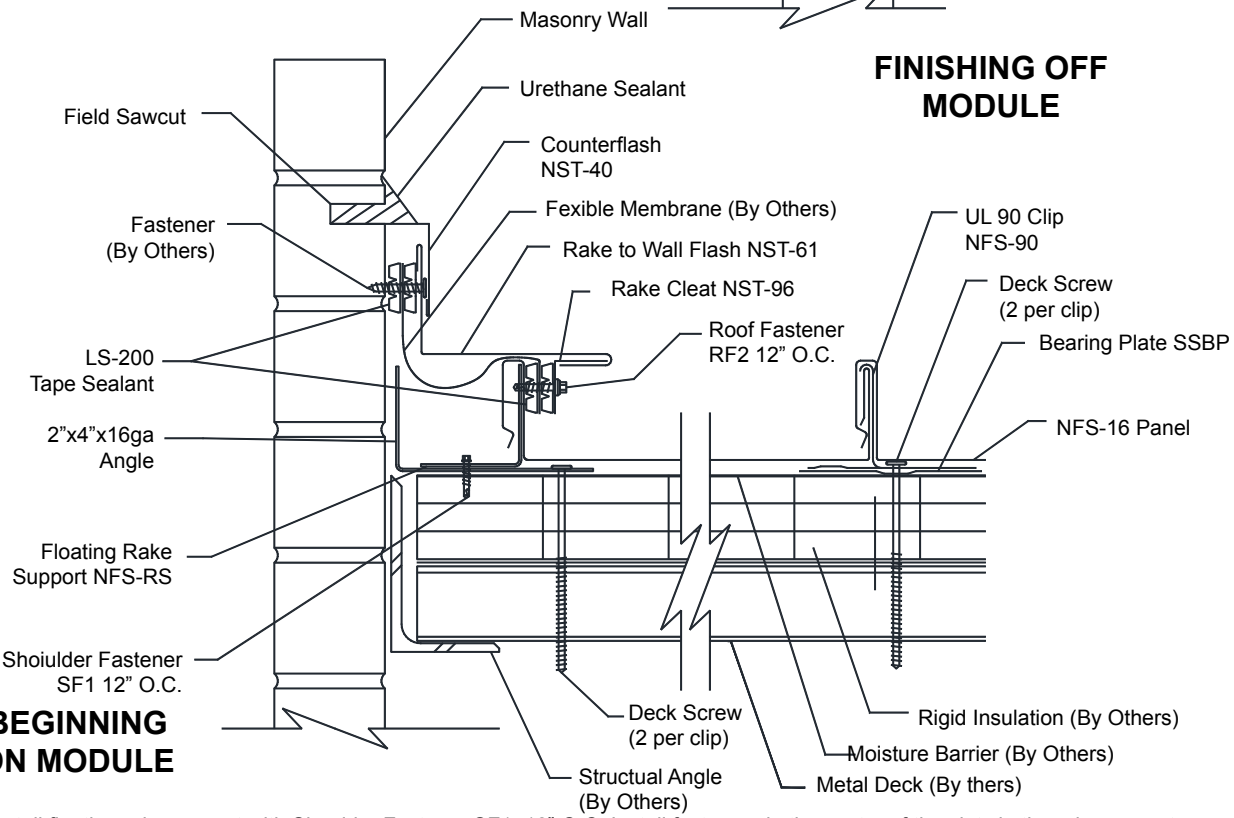
NOTES:

1. The top dimension of the rake trim will be affected by the wall panel thickness.
2. Install floating rake support with Shoulder Fastener SF1, 12" O.C. Install fasteners in the center of the slots in the rake support.
3. Engage the female leg of the panel over the rake support.
4. Apply LS-200 Tape Sealant to vertical leg of panel. Install rake cleat to panel leg with Roof Fastener RF2 at 12" O.C. **FASTENERS MUST GO THROUGH THE RAKE SUPPORT.**
5. Apply LS-200 Tape Sealant to the top of the parapet rake cleat and attach rake trim to rake cleat with Roof Fastener RF3 at 12" O.C.
6. Use a continuous cleat to hold bottom of rake trim in place. Fasten continuous cleat at each high rib of wall panel.
7. If roof finishes on module, finishing detail will be similar to starting detail. If roof finishes off module, field cut and bend last panel run to fit against floating rake support. Install parapet rake cleat and rake trim as previously described.
8. If rake trim is not to be immediatly installed, temporarily fasten panels to rake support to prevent wind damage.

11.5 ROOF TO WALL TRANSITION TRIM DETAILS OVER METAL DECK

FLOATING RAKE TO WALL DETAIL





NOTES:

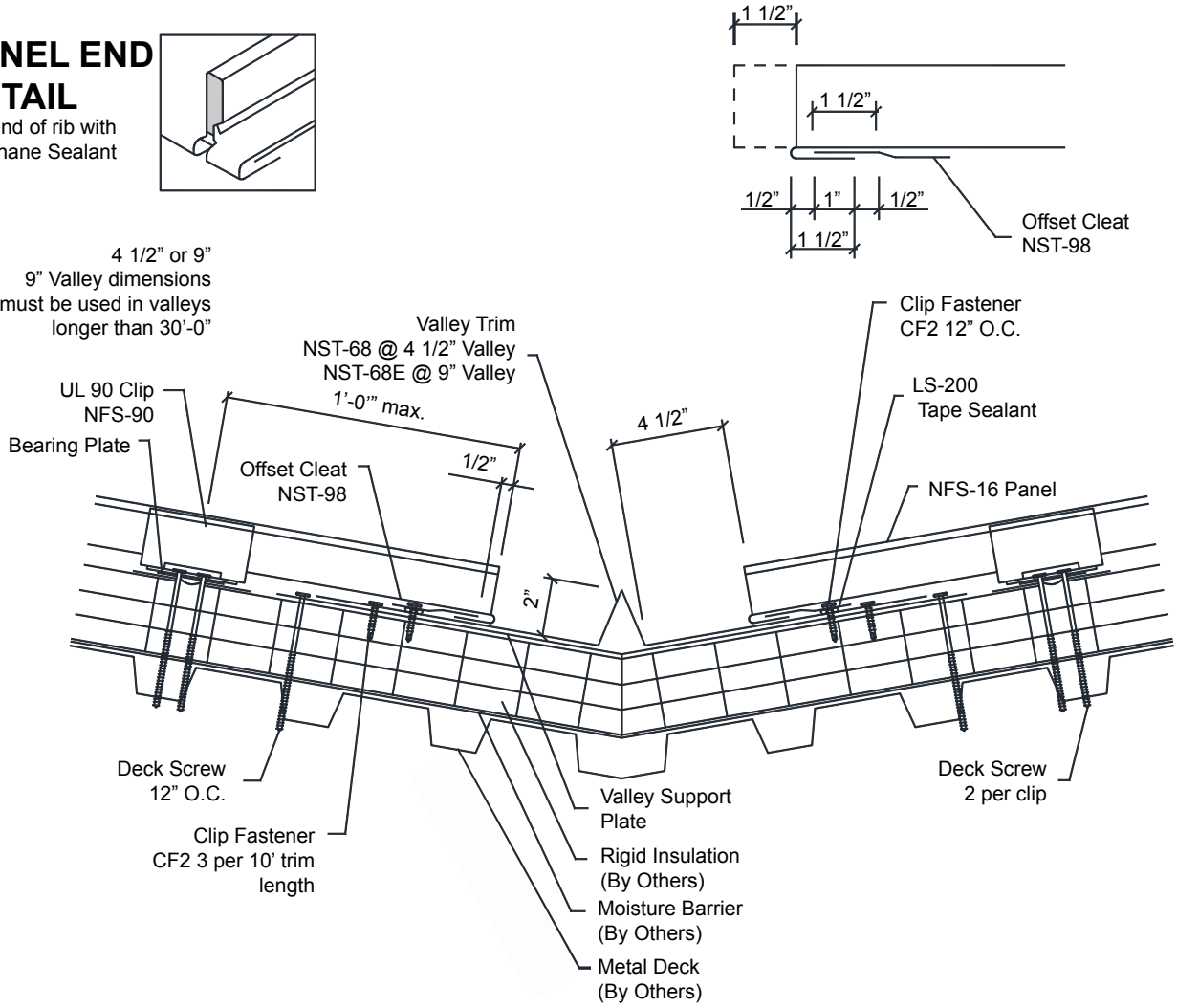
1. Install floating rake support with Shoulder Fastener SF1, 12" O.C. Install fasteners in the center of the slots in the rake support.
2. Engage the female leg of the panel over the rake support.
3. Apply LS-200 Tape Sealant to vertical leg of panel. Install flexible membrane over the LS-200 Tape Sealant and apply a second layer of LS-200 Tape Sealant over the flexible membrane. Install rake cleat to panel leg with Roof Fastener RF2 at 1'-0" O.C. **FASTENERS MUST GO THROUGH THE RAKE SUPPORT.**
4. Engage open hem of Rake to Wall Flash onto rake cleat. Attach flexible membrane and top leg of Rake to Wall Flash to wall with an appropriate fastener, depending on wall substructure.
5. If roof finishes on module, finishing detail will be similar to starting detail. If roof finishes off module, field cut and bend last panel run to fit against floating rake support. Install rake cleat and rake trim as previously described.

11.6 HIP AND VALLEY DETAILS OVER METAL DECK

FLOATING VALLEY DETAIL

PANEL END DETAIL

Fill end of rib with Urethane Sealant

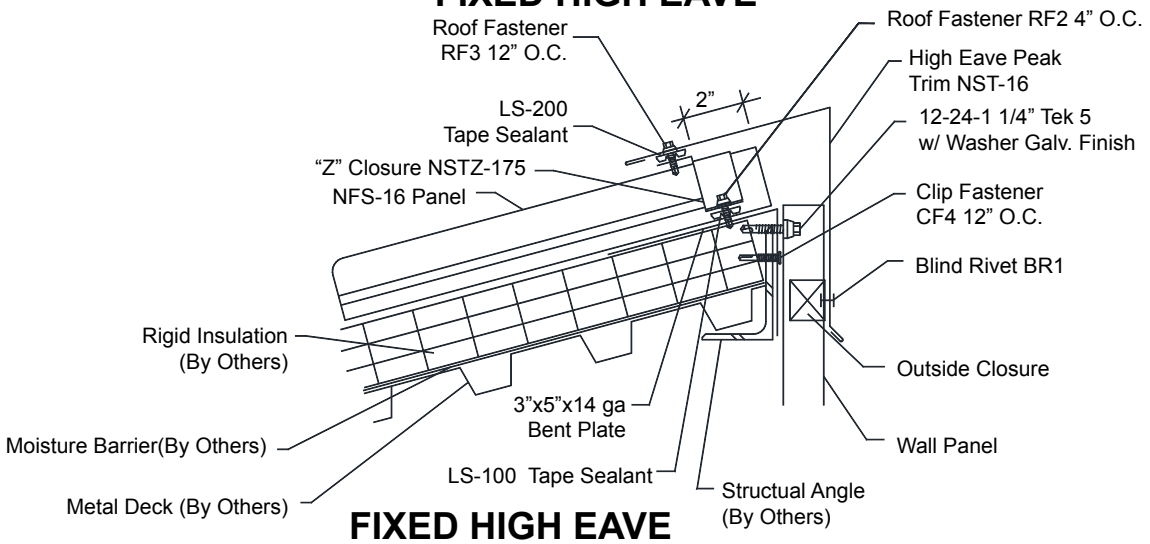


NOTES:

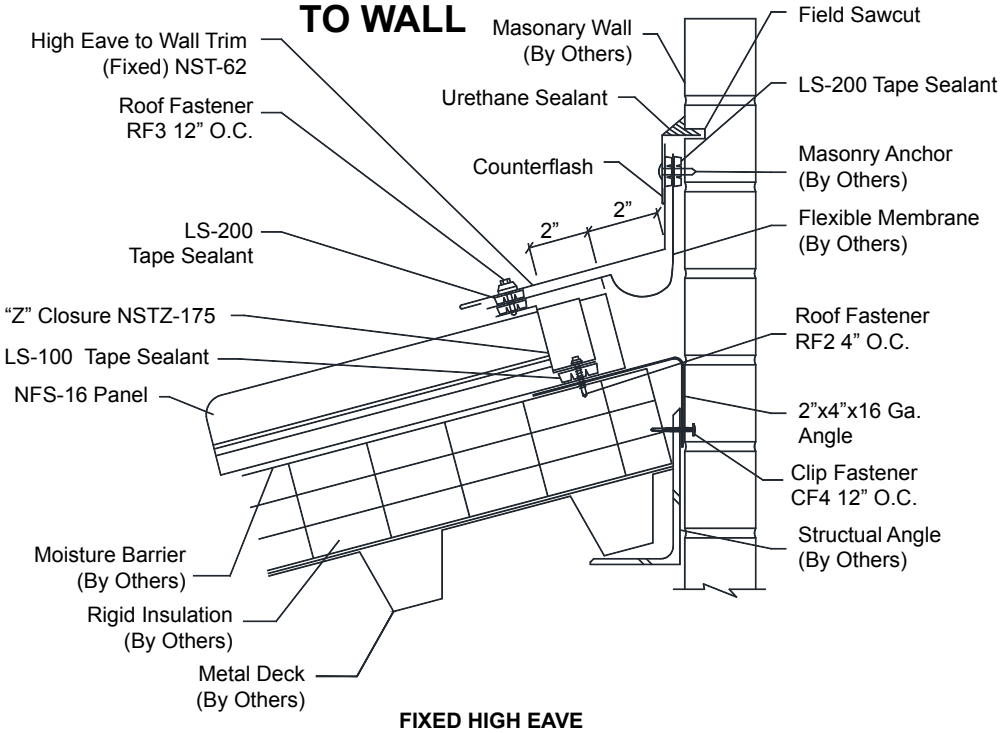
1. For valleys longer than 30", use extended valley trim.
2. Panels must be attached to the substructure at the ridge, high eave or hip to prevent them from sliding downslope.
3. Offset cleat is installed continuously along slope of valley over LS-200 Tape Sealant with Clip Fastener CF2 at 12" O.C. **FASTENERS MUST GO THROUGH TAPE SEALANT.**
4. **Add 1 1/2" to panel length for panel hem.**
5. See "Panel Rib End Sealant Details" on page 33 to seal panel rib ends at valley.

11.7 HIGH SIDE EAVE TRIM DETAILS OVER METAL DECK

FIXED HIGH EAVE



FIXED HIGH EAVE TO WALL



NOTES:

FIXED HIGH EAVE

1. **Use this detail with a floating eave or valley detail.**
2. Notch panel ribs for "Z" Closure leaving primary rib vertical.
2. Install panels and clips.
3. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
4. Install LS-100 Tape Sealant to panels. The center of the Tape Sealant should be 1 1/2" from end of panel.
5. Install "Z" Closures to panels with Roof Fastener RF2 at 12" O.C. Vertical leg of "Z" Closure should be 2" from end of panel.
6. Install LS-200 Tape Sealant to top of "Z" Closures.
7. Attach high eave peak trim to "Z" Closure with Roof Fastener RF3 at 12" O.C.

FIXED HIGH EAVE TO WALL

1. **Use this detail with a floating eave or valley detail.**
2. Notch panel ribs for "Z" Closure leaving primary rib vertical.
2. Install panels and clips.
3. Field cut "Z" Closures to fit panel width. Cut tabs as shown on page 30.
4. Install LS-100 Tape Sealant to panels. The center of the Tape Sealant should be 1 1/2" from end of panel.
5. Install "Z" Closures to panels with Roof Fastener RF2 at 4" O.C. max. Vertical leg of "Z" Closure should be 2" from end of panel.
6. Install LS-200 Tape Sealant to top of "Z" Closures.
7. Install Flexible Membrane over LS-200 Tape Sealant. Apply a second layer of LS-200 Tape Sealant to top of the Flexible Membrane.
8. Attach High Eave Peak Trim to "Z" Closure with Roof Fastener RF3 at 12" O.C.