NUCOR BUILDING SYSTEMS

HR3 INSULATED ROOF PANEL

ERECTION MANUAL

FOR FIELD USE

PLEASE DISTRIBUTE TO THE ERECTION CREW

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DUE TO THE PROCESS OF CONTINUOUS IMPROVEMENT, THE PRODUCTS AND PROCEDURES IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE

ERECTION MANUAL REVISION INFORMATION			
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1.0 GENERAL

1.1 PURPOSE OF THIS MANUAL

This erection manual is provided to Nucor Builders and their erectors as the recommended procedure for the correct assembly of the Nucor Building Systems (NBS) "HR3" Roof System.

The following pages are suggestions and guidelines for installation of 2.5" - 6'' thick insulated roof panels. We believe that all of the information presented is accurate, but it is not intended to cover **all** instances, building designs or codes. (Note: Panels for Cold Storage\Freezer applications, require special details and considerations not addressed by these details).

This manual is intended to be used in conjunction with the project's erection drawings to help plan and organize the installation of the NBS "HR3" Roof System. The erection drawings identify the applicable roof conditions and govern specific part arrangements. The instructions 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 manual applies to most of the standard conditions. Custom roof conditions, including custom details and instructions, will be covered by the erection drawings**. In the case of conflict between this installation manual and the erection drawings, the erection drawings will take precedence.**

The NBS "HR3" Roof System can be erected on many different types of construction. However, for this manual we have assumed this roof system will be erected on a new pre-engineered metal building.

1.2 BUYER'S RESPONSIBILITY

The buyer is responsible for proper installation of the roof in accordance with the erection drawings and this manual, and in accordance with good engineering and construction practices.

The buyer 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 manual, then assure that the erector correctly follows the manual's instructions.

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

Clarification concerning the NBS "HR3" roof installation should be directed to the **QUALITY SERVICE REPRESENTATIVE** at the NBS plant. The following is a list of addresses and phone numbers for the quality service representative at each NBS division:

WATERLOO, IN
305 Industrial Parkway
Waterloo, IN 46793
Phone: 260-837-7891
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SWANSEA, SC
200 Whetstone Road
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1.3 MBMA

This building is designed, manufactured, and delivered in accordance with most recent addition of the **M.B.M.A. METAL BUILDING SYSTEMS MANUAL. CONSULT THE INFORMATION IN THE "COMMON INDUSTRY PRACTICES" SECTION.**

1.4 DISCLAIMER

THE PRODUCTS AND PROCEDURES IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE

1.5 UNLOADING AND STORING

Check the quantities and condition of **all** "HR3" bundles and trim crates on arrival. Note on the delivery tickets any shortages, damage, or discrepancies. NBS shall **not be** liable for damage or shortages that are **not** noted on the delivery tickets. The customer assumes full responsibility for the condition of this material after deliver by the trucking company.

Extreme care should be exercised when unloading and handling the panel bundles and accessory crates to prevent damage. The weight of the panel bundle is printed on the bundle tag on the end of each bundle.

To avoid damage to the panels, steel cables, chains, or chokers **shall not** be used.

The "HR3" panels and accessories shall be stored on high ground, sloped to drain and tarped to protect from moisture formation. The tarp should be open at each end to allow consistent airflow through the bundles. The recommended procedures are outlined in this manual. NBS will not be held responsible for damage or discoloration of panels caused by improper storage.

SEE SECTION 4.0 FOR PROPER UN-LOADING AND STORING METHODS

1.6 ERECTION SEQUENCE

The HR3 panel system **is** a handed system, meaning the erection sequence is from left to right. Low eave panels have a factory cut on the underside of the panel **4"** up from the end. On buildings with endlaps, the upper panel has a factory cut on the underside of the panel **6"** up from the end.

1.7 COORDINATION WITH OTHER TRADES

Supports for the Nucor "HR3" Roof System shall be provided and are required as shown in the sections and as noted in these specifications. All necessary clearance dimensions for proper elevations relative to the roof panels have been shown. The contractor shall be responsible for coordinating these dimensional requirements with other trades associated with the building roof system.

1.8 ERECTION CARE

The Erector must be skilled in the erection of Metal Building Systems, including roof panels, and is responsible for complying with all applicable local, federal and state construction and safety regulations including OSHA regulations as well as any applicable requirements of local, national, or international union rules or practices. The Erector remains solely responsible for the safety and appropriateness of all techniques and methods utilized by its crew in the erection of the Metal Building System and/or the "HR3" roof system. The Erector and/or Contractor is also responsible for supplying safety devices, such as scaffolds, runways, nets, etc. which may be required to safely erect the Metal Building System and/or "HR3" roof system.

The Erector of the Nucor "HR3" Roof System shall exercise great care and attention to the details as shown on the erection drawings and in the Nucor "HR3" erection manual to insure a secure and proper fit of all components. NBS shall not be responsible for supervising and/or coordinating the erection of the "HR3" Roof System with other trades.

ERECTION CARE (CONTINUED)
Due consideration must be given by the erector to the effects of thermal expansion and contraction when erecting a roof tie-in to an existing structure to insure a safe, secure, weather-tight condition. **Flashing for tie-ins to existing buildings is typically not included as part of the material provided by NBS.** Refer to the sections and details for specific materials provided by NBS.

1.9 FIELD CUTTING OF PANELS

When field cutting or mitering "HR3" roof panels, use non-abrasive cutting tools such as nibblers or tin-snips. Also, a circular saw with a proper carbide blade may be used. Check the saw blade manufactures' specifications for proper application.

Abrasive cutting tools such as mechanical grinders, reciprocating saws, shears, or scissors can damage the finish and create excess metal shavings that can corrode the panels. The use of non-approved cutting devices may void the factory warranty.

Field Cutting tips:

Use adhesive tape on both sides of the cut line to protect panel surface.

If panel thickness is greater that the saw blade radius, cut one side at a time.

Cut foam between the metals panels with a sharp knife.

Double check measurements prior to cutting panel.

Clean off ALL metal shavings after cutting.

Remove any burrs from panel after cutting.

DO NOT use a reciprocating saw, as friction may damage the panel finish and /or cause delamination of the panel.

1.10 TRIM AND FLASHING

NOTE: Trim and/or flashing for transitions to existing buildings is not supplied by NBS.

1.11 ENGINEERING AND REINFORCING MATERIALS

NOTE: NBS **does not** supply engineering investigations or materials to reinforce existing non-Nucor buildings. These type investigations must be submitted to the project engineer of record.

2.0 DESIGN AND PERFORMANCE CRITERIA

2.1 ROOF SYSTEM

The NBS "HR3" Roof System consists of 26 gage panels on both sides with a nominal coverage of 3'-4". The panel seam that is 1 1/2" tall and the panel thickness range is from 2.5" to 6" thick. This system is a fastened through method meaning, fasteners go through the panel into the support member.

IMPORTANT NOTE:

This panel system **is** a handed system meaning the erection sequence is from left to right. Low eave panels have a factory cut on the underside of the panel **4"** up from the end. On buildings with endlaps, the upper panel has a factory cut on the underside of the panel **6"** up from the end. **ENDLAPS ARE INLINE** with this system.

Unless requested at order entry, the panel side laps and panel joints do not have sealant in them. Field applied butyl tape mastic will need to be installed into the panel seam AND butyl tube caulk will need to be installed into the panel joint prior to installation (supplied with job). See Cad details and this erection manual for locations.

Protective Plastic Film:

ALL Insulated panels have a temporary protective plastic. If applicable, panels may have film on both sides. This film keeps the metal surface clean and helps prevent damage in shipping and handling.

Strip protective film only from side joints and flashing areas **before** installing the panel and **prior** to installing sealant, and fasteners. After the panels have been installed in an area, remove the protective film completely as soon as possible. Remove film as work progresses to avoid damage to panel finish by foot traffic.

If utilizing a suction lifting system, the panel coat will need to be removed prior to lifting the panels.

For best plastic film removal, start at a panel corner and pull off the protective plastic film at a 45-degree angle. Pull with even tension on the film to prevent tearing and to facilitate removal.

Different seam types may be used on specific areas of a roof. In all cases, refer to the erection drawing roof sheeting plan and details for seam type and location. Also refer to the Seaming Manual for instructions on proper use of the seaming equipment.

2.2 PANEL FASTENER SPACING

The NBS "HR3" Roof System uses a fasten through method to attach the panels to the roof secondary members.

2.3 PANEL FASTENER REQMT'S

NBS' standard fasteners are designed to fasten to a steel structural member of .060" minimum thickness (16 Ga.). **one fastener** is required to engage the structural member at **every** panel rib location. Fasten roof panel along rake with **two fasteners** at each support member and **one fastener** at third points between supports. Required fastener pullout values are dependent upon project location, size, building code, and loading. Consult Nucor Engineering for project-dependent fastener specifications.

Note: Protective plastic film is not to be exposed to direct sunlight for more than 48 hours.

Prolonged exposure to direct sunlight and/or moisture will cause the plastic film to bond to the metal panel face. Once the plastic film has bonded to the metal surface, the removal of the plastic film becomes very difficult. Therefore, it is imperative to follow the jobsite handling and storing instructions. Store the panels properly in a dry location where they are covered from direct sunlight.

3.0 NUCOR "HR3" ROOF COMPONENTS WITH ENGINEERING

3.1 COMPONENTS WITH ENGINEERING DEFINITION

In a case where NBS is providing the "HR3" Roof System to be used in conjunction with a non-Nucor structure, NBS refers to that as a "Components with Engineering". This simply means that NBS shall calculate the quantities and lengths for the material required. NBS is performing no engineering study of the existing structure. The engineer of record on the project shall be responsible for coordinating the "HR3" Roof System with the other trades of the project to insure a safe, quality, and proper application of the roof system. NBS does not supply fasteners to attach to non-Nucor framing materials.

3.2 DIAPHRAGM

The NBS "HR3" Roof is designed to accommodate thermal expansion and contraction and will NOT act as a diaphragm for resisting lateral load forces or providing lateral stability to the roof structural members. Due consideration for this must be addressed by the project engineer of record.

When replacing an existing screwdown roof, additional bracing may be required to laterally support the members. Engineering and material for these uses shall not be provided by NBS.

3.3 PANEL FASTENING REQUIREMENTS

Refer to section **2.3** "Design and Performance Criteria" for "HR3" Roof panel fastening requirements.

4.0 RECEIVING & HANDLING ROOF MATERIALS

4.1 FIELD STORAGE OF MATERIALS

Upon acceptance of the shipment, the buyer or his representative is responsible for proper handling, storage, and security of the roof materials. NBS is **not liable** for damage, injury, or loss as a result of improper storage and/or handling.

The roof panel bundles should be stored on the job site in accordance with the following recommendations.

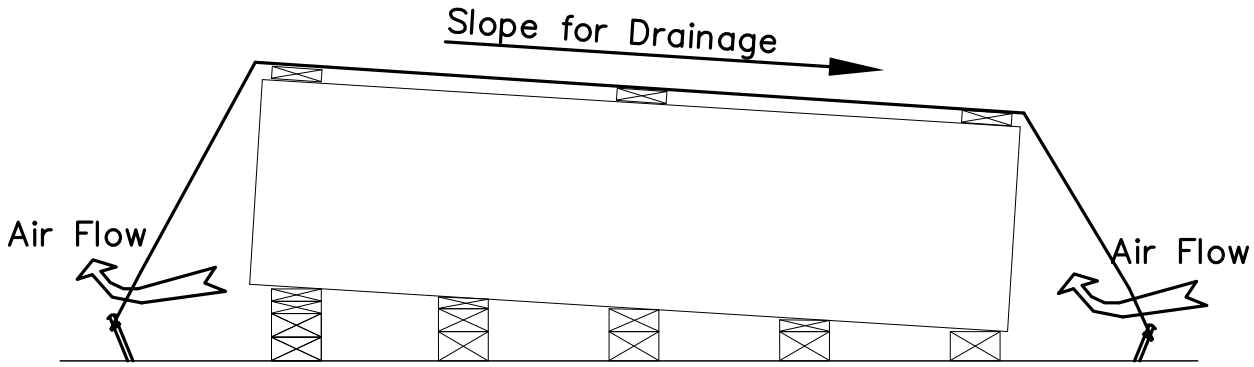
a. Store panels in a protected area, out of standing water and drifting snow, etc. Panel bundles and trim crates should be blocked 12" above grade.
b. Elevate panels with blocking to allow air circulation under the bundle.
c. Slope panels for drainage of moisture from the panels.
d. Cover panels with waterproof tarp, allowing for air circulation (**do not wrap tarp under panel bundle 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.
h. Bundles should be located over primary structural frame lines, not in the middle of the bay. Blocking should be used between the purlins/joists at the panel bundle locations. This blocking is not supplied by NBS.

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 8' (maximum) spaces.

All bundles or loose panels on the roof should be secured to the roof secondary members at the end of each workday. On steep sloped roofs, provisions should be taken to prevent panels, panel bundles, and/or trim 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, mastics, closures, etc. should be stored out of the weather and protected from contamination.

IMPORTANT NOTE: The finish is also subject to severe damage if moisture, debris, or dust is allowed to get between the panels; therefore, panels **MUST BE STORED UNDER COVER** with one end elevated to allow for drainage and protection against moisture, dust, or debris until erected. The manufacturer will not accept claims for non-performing panels if not properly stored at the jobsite. The customer assumes full responsibility for the condition of this material after deliver by the trucking company.



4.2 HANDLING INDIVIDUAL ROOF PANELS

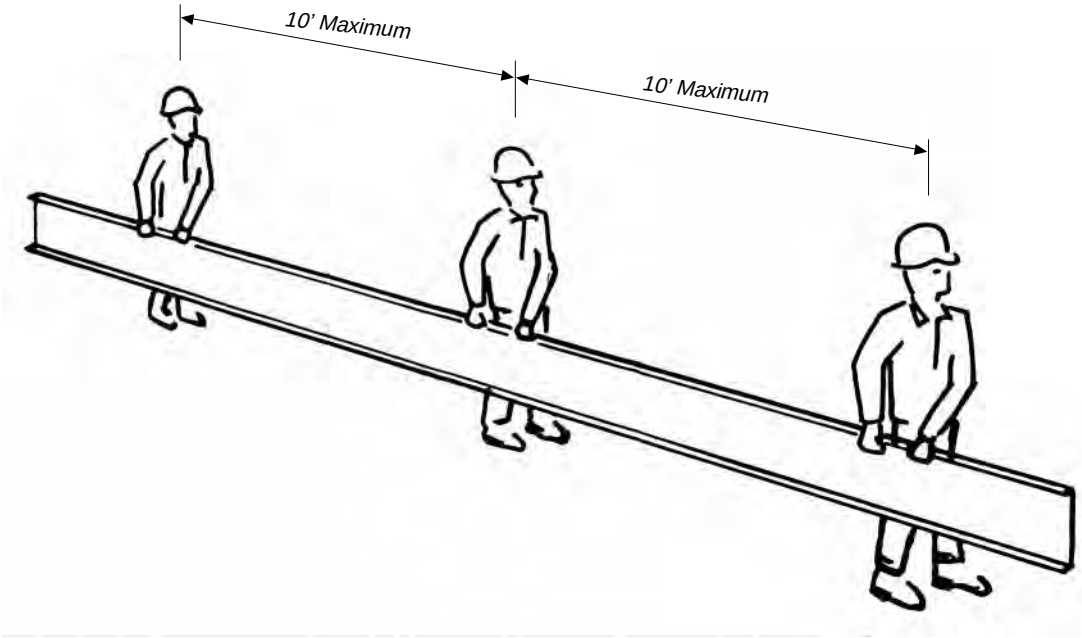
To lift individual panels, lift one side of the panel by the seam letting it hang naturally to prevent buckling. Pick-up points should not be more than 10' apart. **Do not pick-up panels by the ends only, or in a flat position. Do not use any type of steel or cable slings.**

4.3 HANDLING ROOF MATERIALS IN STRONG WINDS

Do not attempt to move panels in strong winds. Wind pressure can easily cause a person to lose balance and fall. Strong wind uplift on a panel can lift the weight of the person 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 secondary members. Clamp or block panel bundles and trim crates to prevent them from sliding down the roof slope.



4.4 MATERIAL INVENTORY

Your material is carefully inspected and packaged 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. Note any damage or discrepancies on the delivery tickets before signing as receiver.

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. **All claims must be filed with NBS Quality Service Representatives prior to any field modifications or purchases that may result in a charge to NBS.**

It is imperative that any shortages or damages of the delivered materials be noted at once and clearly marked on the bill of lading before signature of acceptance. Notify NBS immediately of any conflicts. NBS will not be responsible for shortages or damages unless they are noted on the bill of lading. NBS is not responsible for items accepted in questionable condition.

In the case of packaged components (such as fasteners, and mastics, etc.), the quantities are marked on their container and should be checked against the bill of materials.

4.5 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.

Nylon slings will be required to minimize panel damage. Nucor recommends a minimum 4" wide nylon sling be used. Panels are spiral wrapped with stretch-film and shipped flat. Panel bundles are reinforced at specified lifting points to prevent damage when lifting. These points are clearly marked on the bundle.

Extreme care should be taken to avoid bumping or dropping the panels when lifting and maneuvering.

When unloading longer bundles two or more lifting points may be required. Over engagement of forks will cause damage to the materials located on the opposite side of the bundle being lifted.

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

Trim crates are to be handled in the same way as panel bundles.

Panel bundle weight can be found on the I.D. tag at the low end of each bundle. Steel chokers, cables or chains shall not be used.

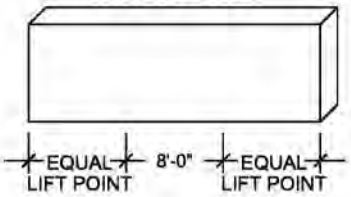
4.6 UN-LOADING & LIFTING ROOF PANEL BUNDLES

UNLOADING WITH A CRANE

CRANE LIFTING OF THE "INDIVIDUAL" BUNDLES SHOULD BE BY NYLON SLINGS OR SIMILAR LOCATED AT A MINIMUM OF TWO POINTS ALONG THE LENGTH OF THE BUNDLE. MULTIPLE LIFTING POINTS MAY BE REQUIRED WHEN LIFTING BY CRANE. SUITABLY STIFF INSERTS SHOULD BE LOCATED AT THE TOP AND BOTTOM OF THE BUNDLES AT THE SLING POSITIONS TO PROTECT THE EDGES OF THE UPPER AND LOWER PANELS. IF PACKS ARE LONGER THAN 15 FEET IT IS SUGGESTED THAT A PROPERLY DESIGNED AND FABRICATED LIFTING BEAM IS USED. EXTREME CARE SHOULD BE TAKEN TO AVOID BUMPING AND DROPPING OF THE BUNDLES WHEN LIFTING.

HOIST THE PANELS TO THE ROOF WITH THE AID OF NYLON SLINGS AND A SPREADER BAR TO PREVENT ANY CHANCE OF BENDING OR BUCKLING THE PANELS.

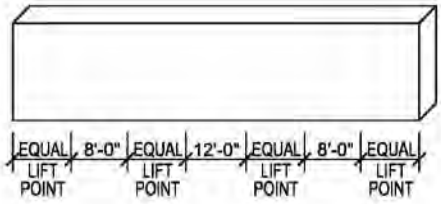
STANDARD LENGTH BUNDLES
10'-0" OR LONGER



USE ONE FORKLIFT TO LIFT BUNDLES AT THE 8'-0" LIFT POINT SECTION. LIFT POINT SECTION IS BOUNDARY MARKED IN RED -- KEEP FORKS WITHIN THE MARKS.

FIGURE 1

LONG LENGTH BUNDLES
36'-0" OR LONGER



BE CAREFUL WHEN UNLOADING OR MOVING BUNDLES 36'-0" OR LONGER THAT YOU DO NOT POSITION YOUR LIFT AT THE CENTER OF THE BUNDLE. THIS WILL CAUSE PANEL DAMAGE.

USE TWO FORKLIFTS OR CRANE STRAPS TO LIFT BUNDLES AT THE 8'-0" LIFT POINT SECTIONS.

FIGURE 2

MANUALLY UNLOADING

ON SMALL PROJECTS UNLOADING OF THE PANELS MAY BE CARRIED OUT BY HAND.
NOTE: SPECIAL CARE SHOULD BE TAKEN WHEN HANDLING. ALWAYS LIFT THE PANELS WHEN REMOVING FROM A BUNDLE, NEVER DRAG THEM.

WARNING: TO PREVENT JOINT DAMAGE, NEVER LIFT THE PANEL FROM THE FLAT POSITION BY THE SIDE JOINT OR THE OVERLAPPING RIB.

IT IS IMPORTANT THAT WHENEVER A PANEL IS HANDLED, PICKED-UP, MOVED OR CARRIED IT SHOULD BE TURNED ON EDGE FIRST. DO NOT CARRY PANEL WHILE FLAT.

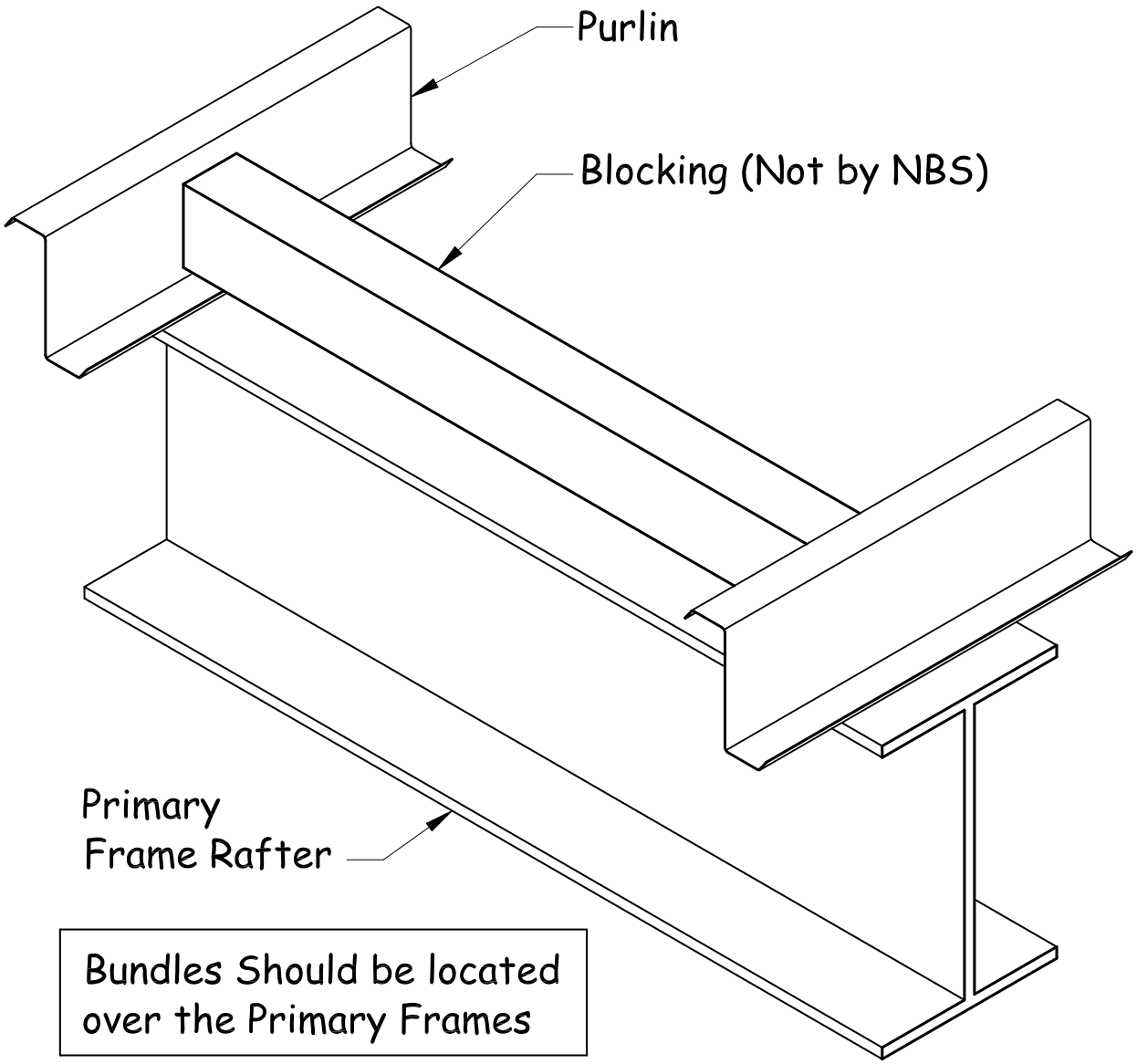
IMPORTANT NOTE: ALL PERSONNEL DOING THESE PROCEDURES MUST WEAR AT ALL TIMES THE PROPER CLOTHING, PROTECTIVE EYE WEAR AND GLOVES.

4.7 PLACING PANEL BUNDLES ON THE ROOF

Locate the bundles on the roof according to the erection sequence.

The bundles should be located over the primary structural frame lines, not in the middle of a bay.

Blocking should be used between purlins at the bundle locations as shown in the detail below. This blocking is not provided by NBS.



5.0 SAFE ROOF INSTALLATION

5.1 REGULATIONS

Regulations set forth by the Occupational Safety and Health Act, local, state, and/or federal agencies should be adhered to at all times. NBS is not responsible for injury, damage, or failure, which may be the result from failing to meet any of these regulations.

In compliance with the Hazard Communication Rule 1910:1200, Material Safety Data Sheets (MSDS) have been provided for your use and safety. These data sheets should be made available to all personnel that come in contact with these products. These data sheets will give you the necessary information to properly handle such materials and what to do in case of an emergency. (The MSDS sheets are located in one of the warehouse boxes for non-Nucor builders, and in the office of Nucor Builders).

5.2 ERECTOR'S RESPONSIBILITY

The erector of the roof system is responsible for the safe execution of this manual. These instructions are intended to describe the sequence and proper placement of parts. They are not intended to prescribe comprehensive safety procedures. The procedures in this manual are believed to be reliable. However, NBS shall not be responsible for injury, damage, or failure due to the misapplication of these procedures, improper erection techniques, or negligence

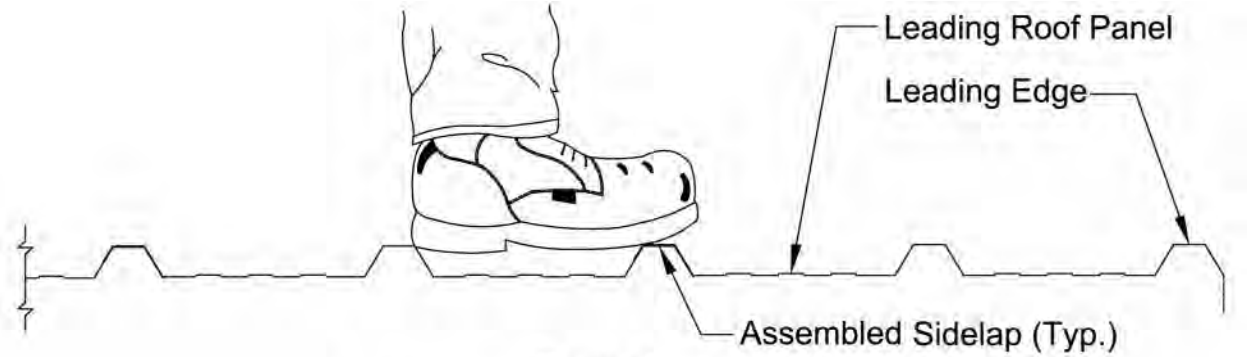
5.3 WALKING AND WORKING ON ROOF PANELS

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.

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 fasteners or making end lap 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 panel

5.4 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.

5.5 CREW SIZE

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

5.6 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.

5.7 POINT LOADS

When properly supported by the structural steel, 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.

5.8 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 and 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.

5.9 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.

5.10 SHARP EDGES

Some edges or panels and flashing 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 flashing.

5.11 SAFE ROOF INSTALLATION SUMMARY

- **EXTREME CAUTION SHOULD BE EXERCISED WHEN WALKING ON ROOF PANELS.**
- **OILS USED DURING THE ROLL FORMING PROCESS AND/OR NATURAL MOISTURE MAY CAUSE THE PANELS TO BECOME SLIPPERY.**
- **DO NOT STEP ON PANELS WITH CREASED EDGES.**
- **DO NOT STEP ON OR NEAR THE EDGE OF A PANEL.**
- **DO NOT STEP WITHIN 5 FEET OF THE END OF A PANEL.**
- **DO NOT USE LOOSE PANELS AS WORK PLATFORMS.**
- **DO NOT WALK ON UNSECURED PANELS.**
- **DO NOT WALK ON TRANSLUCENT PANELS.**
- **SECURE ALL LOOSE PANELS AT THE END OF THE WORK DAY.**
- **USE EXTRA CARE WHEN WORKING ON STEEP SLOPES.**

IN COMPLIANCE WITH THE HAZARD COMMUNICATION RULE 1910:1200, MATERIAL SAFETY DATA SHEETS HAVE BEEN PROVIDED FOR YOUR USE AND SAFETY. THESE DATA SHEETS SHOULD BE MADE AVAILABLE TO ALL PERSONNEL THAT COME IN CONTACT WITH THESE PRODUCTS. THESE DATA SHEETS WILL GIVE YOU THE NECESSARY INFORMATION TO PROPERLY HANDLE SUCH MATERIALS AND WHAT TO DO IN CASE OF AN EMERGENCY

6.0 CHECKING THE STRUCTURE

6.1 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.

6.2 LATERAL STABILITY

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

6.3 ALIGNMENT & SHIMMING

Prior to installation, roof secondary members should be checked for overall dimensions and evenness of plane. The roof secondary members should also be checked to verify the roof system can be installed without interference. Also, roof secondary members nearest the panel end laps, ridge, or high eave should be checked for correct location to properly accommodate the roof components. Prior to installation of insulated panel, inspect each roof for component alignment and plane flatness.

Roof components should not vary more than 1\2'' over the entire roof surface, including fastener heads and other obstructions that would interfere with continuous bearing of the insulated panel liner face.

Surface should not vary more than 1\4'' over a 20' length in any direction.

Alignment at transition areas, such as corners and eave, shall be within 1\8'' of the theoretical plane to accommodate corner panels and formed flashing.

Misaligned secondary steel *may* require the erector to shim the insulated roof panels at some locations. Shims and labor for installing shims are not by NBS.

6.4 TOLERANCES

To assure the roof system's correct fit-up and designed weather tightness, the structure must be aligned within the following tolerances; also refer to the MBMA manual for common industry standards.

OUT OF SQUARE – The roof system can only accommodate 1/8" of "saw tooth" of the roof panel ends and 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 1/8" for each 40' of rake run.

STRUCTURE WIDTH AND EAVE STRAIGHTNESS – The roof system is designed to accommodate +/- 1" of overall structure width error, or +/- 3/4" 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 line.

To assure that the accumulation of the 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 a rafter end splice).

6.5 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.

6.6 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.

6.7 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. NBS cannot assure the performance of such alternate details.

7.0 INSTALLATION BASICS

7.1 PROPER TOOLS

Before starting the roof installation, 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.

The following tools and equipment should be considered for efficient installation of the NBS "HR3" Roof System. Actual tools and equipment required may vary due to variations in building type and construction:

- Screw Guns-designed for use with self-drilling screws
- Socket Extensions-6" for screw guns
- Hex Socket Heads-5/16" and 3/8", magnetic
- Electric Drill Motor-1/4" capacity
- Drill Bits-assortment
- Sheet Metal Cutter-or power shears or nibblers
- "C" Clamps-vise grip type
- Pop Rivet Tool-1/8" capacity
- Sheet Metal Shears-left and right cut
- Hack Saw-with metal cutting blade
- Steel Measuring Tapes-12', 50', 100, and120'
- Nylon String Lines
- Blue Chalk Line (Not Red)
- Brooms
- Marking Pens (do not use pencils)
- Caulk Guns-for 1/10-gallon mastic tubes
- Power Source and Extension Cords-capable of handling the total equipment requirement, including 20-amp seaming machine, without power drop due to extension cord length.

7.2 MASTIC

TEMPERATURE EFFECTS

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

When overnight temperatures fall below freezing, the mastic should be stored in a heated room so it will be warm enough to use the following day. On hot days, the mastic cartons should be stored off the roof in a cool and shaded area. While on the roof, mastic 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 mastic is in full contact with the panel or flashing. Then on the next sunny day, complete the tightening process after the sun warms the panel and flashing surfaces.

CONTAMINATION

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

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

Tape mastic is provided with a protective paper to reduce contamination. Incomplete removal of the protective paper will prevent the mastic adhesion to the panel or flashing surfaces. Always check that the protective paper is completely removed. **DO NOT** remove the protective paper until immediately before the panel or flashing is installed over the mastic.

COMPRESSION

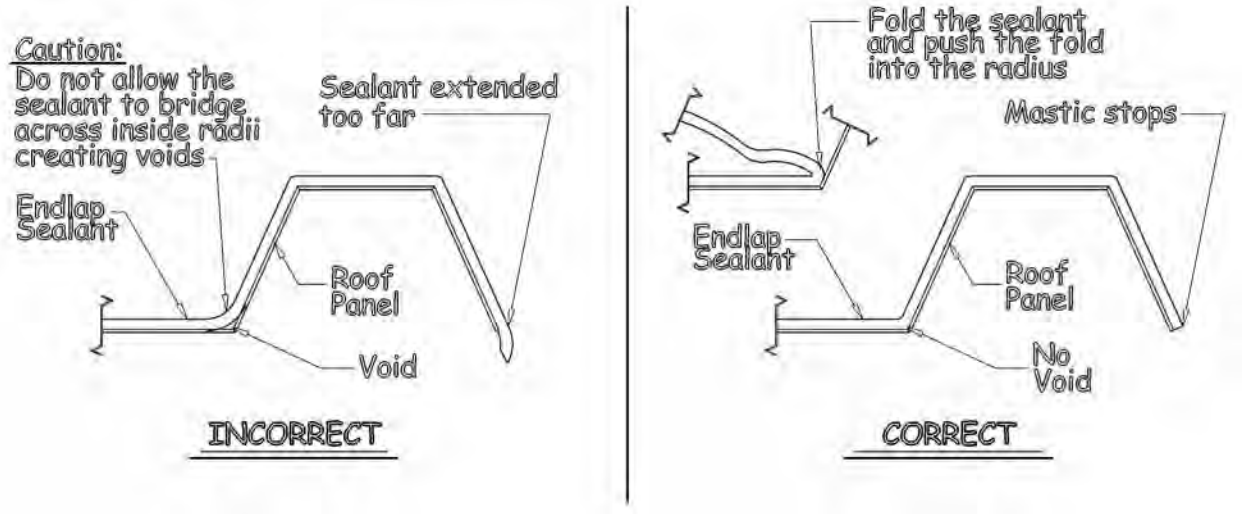
To assure proper compression and seal, the tape mastic must be compressed between the panel and flashing surfaces with firm and uniform pressure. In most cases, the required pressure is applied by the clamping action of screws pulling the adjoining surfaces together. However, the tape sealant's resistance to pressure becomes greater in cold weather.

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

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 mastic across the inside radius.

When the lapping panel or flashing is pushed into place, the bridged mastic is stretched and thinned. The mastic may then be too thin to adequately seal this critical area. When tape mastic is applied at an inside radius, it is recommended that the mastic be folded back, then push the mastic fold into the radius.



7.3 FASTENERS

SCREW GUNS

Use torque control screw guns for driving self-drilling screws. 2000-2500 RPM screw guns with torque adjustable clutch are necessary to attain efficient drilling speeds. High tool amperage (6-7 AMP) is required to achieve the proper torque for secure fastening**. Do not use impacting tools. Also note that cordless screw guns will not work.**

To assure proper voltage to the tool, extension cords should be checked for proper wire size and cord length:

- 16 ga. wire, max cord length = 100'
- 14 ga. wire, max cord length = 200'
- 12 ga. wire, max cord length = 300'

SOCKETS

Use good quality magnetic sockets. Good fitting sockets reduce wobble and stripping of the screw 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 mastic and push the socket into the mastic.

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

SOCKET EXTENSIONS

A 4" or 6" socket extension is recommended for installing the panel screws. With the extension, the screw can be driven straight down without tilting the screw gun to clear the panel.

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.

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 flashing surface during starting and driving.

For proper seating of the fastener-sealing washer, the panel of flashing 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 its metal dome. The recommended procedure is to tighten the fastener until the sealing washer just starts to visually bulge from under the metal dome. **Refer to the chart on the following page for a proper fastener-seating diagram.**

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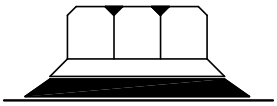
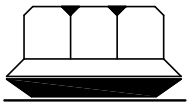
THIS CHART SHOWS PROPER FASTENER SEATING PRACTICE

CORRECT	TOO LOOSE	TOO TIGHT
		
Sealing Material slightly visible around Metal Washer	Sealing Material not visible around Metal Washer	Sealing Material deformed beyond the edge of the Metal Washer

7.4 FIELD CUTTING OF PANELS AND FLASHING

ABRASIVE SAW PROBLEMS

Panels are to be cut one metal side at a time and the insulation can be removed with a utility knife or the blade of a carpenter's handsaw. A circular saw with an appropriate blade set to cut through the metal skin only can be used. Circular saws with abrasive blades are not acceptable. Be sure to cut completely through the metal skin at the side joints.

Abrasive saws (circular saws with friction disks) are not recommended for cutting roof panels or flashing. Abrasive saws create high heat that may burn away the protective cladding from the panel edge, causing the edge to rust.

Also, abrasive saw dust contains fine, hot steel particles, which accumulate on panel and flashing surfaces where they rust and can cause staining and rusting of those surfaces.

Rust caused by abrasive saw damage or abrasive dust particles are excluded from warranty claims.

SHEARING METHODS

It is recommended that flashing be cut with shears or nibblers to provide a clean, undamaged cut. On shear cut edges, the protective cladding 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 flash 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.

MARKING PANELS

- Avoid marking the panels for cutting, etc., in a manner that will leave visible markings, stains, etc., on the finished roof surface. Use chalk or felt tip ink markers. **DO NOT USE GRAPHITE (LEAD) PENCILS ON PANEL AND TRIM SURFACES; THEY CAN ABRADE THE SURFACE, AND THE GRAPHITE WILL CAUSE RUSTING.**
- **Never** use a reciprocating saw to cut insulated panels. Reciprocating saws can cause structural damage to the insulated panels by delaminating the panel face metal from the foam core material.
- **Never** use any type of torch to cut insulated panel.
- **Never** subject an insulated panel to the heat of a torch even when cutting nearby steel. High heat will damage the panel finish and can cause the foam core to produce fumes which may be irritating to some individuals.
- **Never** burn remnants, dispose of insulated panel remnants by depositing in proper garbage facilities.

The panel/bldg. manufacturer (NBS) **will not** be responsible for damage to panels caused by improper cutting methods.

7.5 SHEETING DIRECTION AND MODULARITY

The NBS "HR3" Roof System is designed to be installed from **left** to **right**. The required 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.

During installation of the roof, considerations must be made for maintaining panel modularity. By maintaining panel modularity, proper roof coverage can be obtained and the standard perimeter parts will fit properly without necessity of field modifications or reordering of parts, etc.

For proper fit-up between the panel, mastic and closures or end lap parts, the panels must be held to the 3'-4" coverage dimension (within a 1/8" 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 panel has conditions such as fixed location penetrations, parapets, firewalls, etc., the accumulated panel coverage may require tighter tolerances for proper fit-up and weather-tightness of the roof system.

7.6 LAYOUT AND CHECKING 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 sections **6.4-6.5**) so that the roof panel start and stop dimensions can be laid out to accommodate any structural misalignments.

Panel coverage is always checked at the eave, ridge, and end laps so that non-parallel seam (or dogleg) conditions can be detected and corrected before they become objectionable. The coverage check should be one 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 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.

7.7 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 laps, 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.

7.8 INSPECTION OF THE ROOF ASSEMBLY DURING INSTALLATION

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 manual.

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 material and weather-tightness warranties.

7.9 INSPECTION LIST

ERECTION DRAWINGS

Check that the erection drawings are available at the job site and have been reviewed for differences with the actual job conditions and differences with the erection manual. Also confirm that the drawings are the latest issue with the latest revisions and additions.

ROOF LAYOUTS

Check that the roof start and finish dimensions have been correctly determined based on the erection drawings and the actual structural conditions.

STRUCTURAL ALIGNMENT

Check that the structural misalignments were corrected in accordance with section **6.3** of this manual.

PANEL LENGTH

Check that the installed roof panels have the correct overhang at the eave and end laps and have the correct hold back dimension at the ridge or high eave, in accordance with the erection drawings.

EAVE SEAL

Check that the eave mastic/tube caulk is in the correct position on top of the eave member and that the panel closure is correctly placed. Check that the eave fasteners penetrate the center of the panel closure and into the eave angle. Check that the fasteners are not loose or stripped.

Check that the eave mastic/tube caulk is in complete contact with the roof panel and eave member without any voids or gaps. Confirm that the roof panel and eave member are clean and dry during installation and that the mastic/tube caulk is not wet or otherwise contaminated.

END LAP SEAL

Check that the roof panel end laps are correctly assembled and that the lapping panels are tightly nested without visible gaps.

Check that the mastic is in the correct position and is in complete contact with the lapped panels without any voids or gaps, especially at the radius between the panel flat and the vertical legs of the panel. Confirm that the panels are clean and dry during installation and that the mastic is not wet or otherwise contaminated.

Check that the end lap fasteners penetrate through the center of the mastic. Check that the fasteners are not loose or stripped.

Check that the end lap assembly is not bowed down causing water ponding and debris accumulations.

RIDGE SEAL

Check that the outside closure assembly is correctly installed.

Check that the tape mastic is in the correct position and is in complete contact with the outside closure and the roof panel without any voids or gaps. Confirm that the outside closure and roof panels are clean and dry during installation and the tape mastic is not wet or contaminated.

Check that the outside closure fasteners penetrate through the center of the tape mastic and into the panel. Check that the fasteners are not loose or stripped.

Tube caulk along the up-slope side of the outside closure as necessary to seal any voids around the panel seam area.

On the inside of the ridge, tube caulk each edge of the Inside Ridge Trim.

RAKE SEAL

Check that the mastic between the rake trim and the roof panel is properly installed.

Check that the end caps are installed properly.

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

Check that all fasteners are seated properly.

PANEL ATTACHMENT

Check that the panel saddle washers are correctly fitted to the panel without any distortion or damage.

Apply sealant to side laps as shown in this manual and/or the erection drawings.

Check that the panel fasteners are of the type, size, length, finish and quantity per location as specified on the erection drawings.

Check that the panel fasteners are not loose or stripped.

SIDE LAP

Check that the field installed side lap tape mastic is in the correct position without voids or interruptions and is not damaged, wet or otherwise contaminated.

Check that the panel coverage tolerance does not exceed 1/8" per panel and that the accumulated coverage will allow proper fit and assembly of the outside panel closure and finish rake condition and any other critical fit conditions such as penetrations, parapets, etc.

FLASHING AND PENETRATIONS

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

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

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

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

7.0 ROOF INSTALLATION BASICS

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

Check that the panel and flashing surfaces are not being subjected to exposed metal objects and material 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 flashing 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 flashing are not subjected to direct contact or runoff from corrosive materials such as: copper pipes and flashing, uncured cement, treated lumber, anti-icing chemicals, galvanized materials, strong solvents or other corrosive materials.

Check that graphite (lead) pencils **were not** used to mark on panel and trim surfaces. Using pencils can abrade the surface, and the graphite marks will cause rusting.

Check that the roof materials are not subjected to damaging heat such as: cutting torches, abrasive saws, etc.

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 mastics and fasteners, are only those which are provided or specified by NBS for your specific project and are used only as a specified on the erection drawings and this installation guide.

NBS cannot be responsible for the performance of roof materials that are not provided, specified or approved by NBS.

7.10 ROOF LEAK TROUBLESHOOTING & POTENTIAL CAUSES OF ROOF LEAKS

The erector does not locate and read the NBS "HR3" erection manual and erection drawing instructions

The erection manual defines the standard details required for installing the NBS "HR3" Roof System. **The manual and erection drawings are shipped in a warehouse crate clearly stamped, "OPEN ME FIRST".** Reading the erection manual and drawings will actually improve the productivity and quality of your work. Be cautious with anyone who tells you that their experience allows them to deviate from the tried and true instructions found in our erection manual and erection drawings.

The end lap is not properly installed.

The upper panel on a roof with a endlap has cut in the underside panel and the insulation **6"** up from one end. For proper fit-up, remove this panel strip and insulation.

The ½" mastic at the end lap is not properly located.

Two strips of tape mastic are required at the endlap. One strip is placed at the edge of the lower panel and the second is placed approx. 4" up slope. Place fasteners along the lower end of the panel, making sure the fasteners penetrate the mastic.

The ridge outside closures are not installed as the roof is put down and/or they are not properly caulked.

If the proper installation procedure is not followed the panel will not be sealed and moisture build up from ice and snow or a driving rain may infiltrate the building. The outside closures must be installed as each roof panel run is installed. Tube caulk along the up-slope side of the outside closure as necessary to seal any voids around the panel seam area.

Incorrect caulking type used at roof locations.

NBS provides two types of tube caulking. A non-skinning butyl caulk is supplied for all roof applications, and a skinning polyurethane caulk is supplied for trim applications. The polyurethane caulk is not to be used in roof applications.

8.0 STANDARD HARDWARE 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.

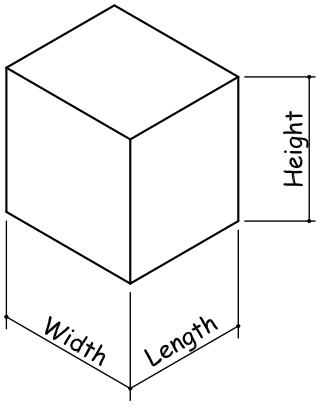
Review the erection drawings for any special parts or parts which are different from the standard parts shown in these details. If differences exist, the erection drawings will take precedence.

For proper fit-up, sealing and fastening, and to help ensure the roof assembly's weather-tightness, 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 HARDWARE PARTS

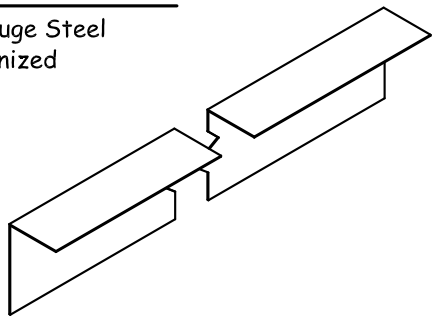
DIMENSION INFORMATION

The detail at right shows how the standard parts are dimensioned. Note that the dimensions given are nominal. Some parts do not have all 3 (length, width, height) dimensions given, as they may not be relevant.



RAKE ANGLE

16 Gauge Steel
Galvanized

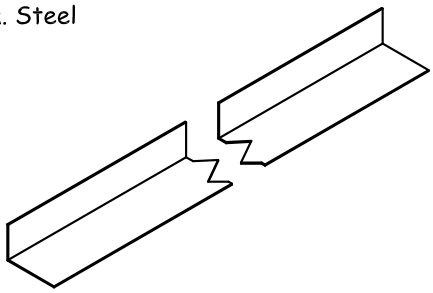


Length = 20'-0"
Width = 3"
Height = 5"

Part No. MAR01

ENDLAP ANGLE

13 ga. Steel

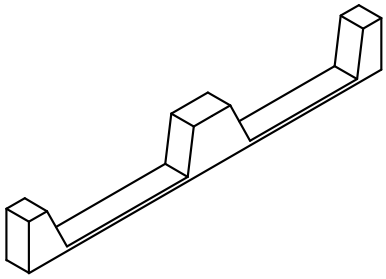


Length = 10'-0"
Width = 3"
Height = 4"

Part No. ELA03

INSIDE FOAM CLOSURE STRIP

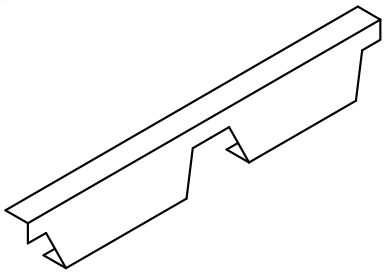
FOAM RUBBER



Length = 3'-4"
Width = 1"
Height = 1 3/8"

METAL CLOSURE

26 Gauge Steel
Painted

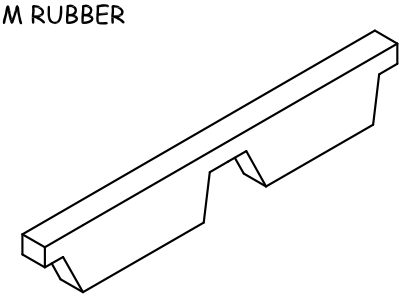


Length = 3'-4"
Width = 2"
Height = 1 3/8"

Part No. AWIP-HRC-03

FOAM CLOSURE STRIP

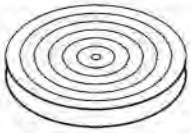
FOAM RUBBER



Length = 3'-4"
Width = 1"
Height = 1 3/8"

TAPE MASTIC

Isobutylene Tripolymer
50'-0" Roll

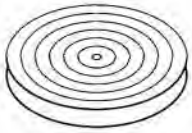


Width = 1/2"
Thickness = 3/32"

Part No. H3010

TAPE MASTIC

Isobutylene Tripolymer
20'-0" Roll



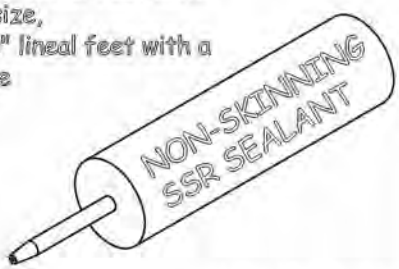
Width = 2 1/4"
Thickness = 3/16"

Part No. H3020

BUTYL TUBE CAULK

Roof Applications

Provides 12'-0" lineal feet with a 3/8" bead size,
Provides 8'-0" lineal feet with a 1/2" bead size

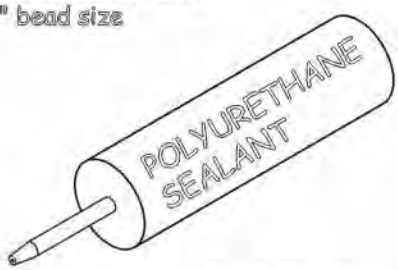


Part No. H3151

POLYURETHANE TUBE CAULK

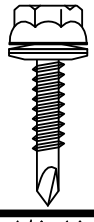
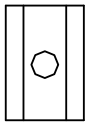
For Use At Trim Laps

Provides 23'-0" lineal feet with a 1/4" to 3/8" bead size

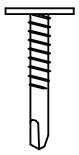
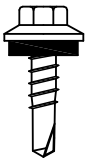


Part No. H3152

8.0 STANDARD HARDWARE PARTS

<table>
<tr><th>FASTENER</th><th>SPECIFICATIONS</th><th>USAGE</th></tr>
<tr><td>H1030
  </td><td>SELF-DRILLING SCREW
No. 12-14x1 1/4" TCP 2 W/ Sealing Washer
LONG LIFE FASTENER - 5/16" HEAD
Recommended Tool Types:
-2000-2500 RPM; Torque Adjustable Clutch
-DO NOT use Impacting Tools</td><td>Used to attach roof flashing and light gauge parts.</td></tr>
<tr><td>1/4 -14
  </td><td>SELF-DRILLING SCREW
1/4-14 x Varies- SDHH W/ Washer 3/8" HEAD
Recommended Tool Types:
-2000 RPM; Torque Adjustable Clutch
-4 Amp or Higher Rated Tools
-DO NOT use Impacting Tools
<table><tr><th>PANEL THK</th><th>FASTENER W/ WASHER</th></tr><tr><td>2 1/2"</td><td>1/4–14 X 3 1/2 SDHH</td></tr><tr><td>4"</td><td>1/4–14 X 5 SDHH</td></tr><tr><td>5"</td><td>1/4–14 X 6 SDHH</td></tr><tr><td>6"</td><td>1/4–14 X 7 SDHH</td></tr></table></td><td>Used to attach Insulated Roof panel to Roof Secondary members in the flat of the Panel.</td></tr>
<tr><td>SW-01
  </td><td>SADDLE WASHER
1 1/2" x 1 1/2" Metal Backed Neoprene Washer
Painted to Match Roof Color</td><td>Used in Conjuntion with the Fasten-Through High Rib Fastener below.</td></tr>
<tr><td>1/4 -14
  </td><td>SELF-DRILLING SCREW
1/4-14 x Varies- SDHH W/ Washer 3/8" HEAD
Recommended Tool Types:
-2000 RPM; Torque Adjustable Clutch
-4 Amp or Higher Rated Tools
-DO NOT use Impacting Tools
<table><tr><th>PANEL THK</th><th>FASTENER W/ WASHER</th></tr><tr><td>2 1/2"</td><td>1/4–14 X 5 SDHH</td></tr><tr><td>4"</td><td>1/4–14 X 7 SDHH</td></tr><tr><td>5"</td><td>1/4–14 X 8 SDHH</td></tr><tr><td>6"</td><td>9" LONG "B" POINT</td></tr><tr><td colspan="2">NOTE: 9" LONG "B" POINT REQUIRES PILOT HOLES TO BE DRILLED</td></tr></table></td><td>Used to attach Insulated Roof Panel to Roof Secondary members at the Panel High Rib.</td></tr>
</table>

8.0 STANDARD HARDWARE PARTS

FASTENER	SPECIFICATIONS	USAGE
H1060 	SELF-TAPPING SCREW No. 1/4-14x 7/8" TCP1 W/O Washer 5/16" HEAD Recommended Tool Types: -2000 RPM; Torque Adjustable Clutch -DO NOT use Impacting Tools	Used attach light gage wall trim end laps and trim to wall panels.
H1100 	POP RIVET 1/8" Blind Pop Rivet Recommended Tool Types: -Manual or Electric Rivet Tool -DO NOT use Impacting Tools	Used at trim laps, corner caps, and attaching light gage material to siding where stitch screws can't be used.
H1220 	SELF-DRILLING SCREW No. 12-14x 1" Self Drilling W/O Washer Phillips Head Recommended Tool Types: -2000 RPM; Torque Adjustable Clutch -DO NOT use Impacting Tools	Used to attach angles to secondary supports
H1020 	SELF-DRILLING SCREW No. 1/4-14x1 1/4" TCP 3 W/O Washer 5/16" HEAD Recommended Tool Types: -2000 RPM; Torque Adjustable Clutch -4 Amp or Higher Rated Tools -DO NOT use Impacting Tools	Used to attach rake angle to purlins
H1050 	SELF-TAPPING SCREW No. 1/4-14x 7/8" TCP1 W/ Sealing Washer LONG LIFE FASTENER - 5/16" HEAD Recommended Tool Types: -2000 RPM; Torque Adjustable Clutch -DO NOT use Impacting Tools	Used attach light gage roof trim end laps and trim to roof panels.

9.0 PREPARATION FOR ROOF PANEL INSTALLATION

9.1 GENERAL

The following details provide graphic illustration of the roof assembly steps. The purpose is to instruct the erector in correct and efficient assembly of the HR3 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 will take precedence.

These details are arranged in a step-by-step sequence. Following this sequence ensures that 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 weather-tightness, the details emphasize proper fit-up, sealing and fastening. It is most important that only the specified mastics and fasteners be used for each condition and that they be installed correctly as shown on these details and the erection drawings.

Panel side laps and seams **do not** have sealant in them. Field applied butyl tube caulk will need to be installed prior to panel installation. (supplied with job) See Cad details and the erection manual for locations.

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

FIELD CUTTING OF PANELS:

When field cutting or mitering "HR3" roof panels, use non-abrasive cutting tools such as nibblers or tin-snips. Also, a circular saw with a proper carbide blade may be used. Check the saw blade manufactures' specifications for proper application.

Abrasive cutting tools such as mechanical grinders, reciprocating saws, shears, or scissors can damage the finish and create excess metal shavings that can corrode the panels. The use of non-approved cutting devices may void the factory warranty.

Field Cutting tips:

Use adhesive tape on both sides of the cut line to protect panel surface.

If panel thickness is greater that the saw blade radius, cut one side at a time.

Cut foam b/w the metal panels with a sharp knife. (Serrated bread knife is suggested)

Double check measurements prior to cutting panel.

Clean off ALL metal shavings after cutting.

Remove any burrs from panel after cutting.

DO NOT use a reciprocating saw, as friction may damage the panel finish and /or cause delamination of the panel.

A grinder with a Teflon wheel is suggested for helping remove foam @ panel cut-back areas.

9.2 PANEL ORIENTATION & LAYOUT

The details in this section will show the installation of the rake angle, perimeter caulk, and the first run of panel.

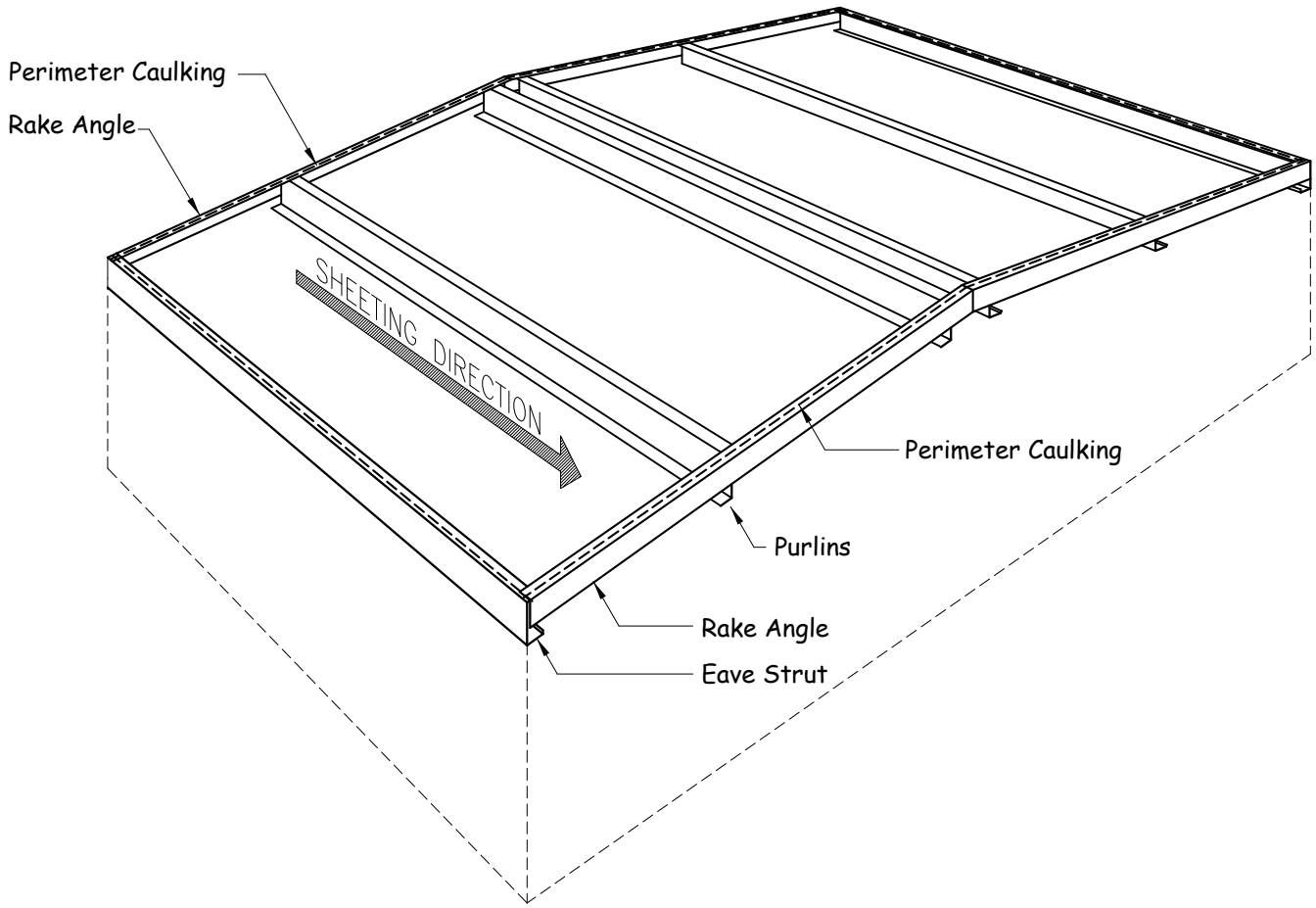
The view below shows the roof system oriented for a left-to-right sheeting direction. The panel erection sequence must always be started from the low eave corner working toward the high eave or ridge. The full panel run from eave to high eave or ridge must be installed before the next panel run can be started.

This panel system **is** a handed system meaning the erection sequence is from left to right. Low eave panels have a factory cut on the underside of the panel **4"** up from the end. On buildings with endlaps, the upper panel has a factory cut on the underside of the panel **6"** up from the end.

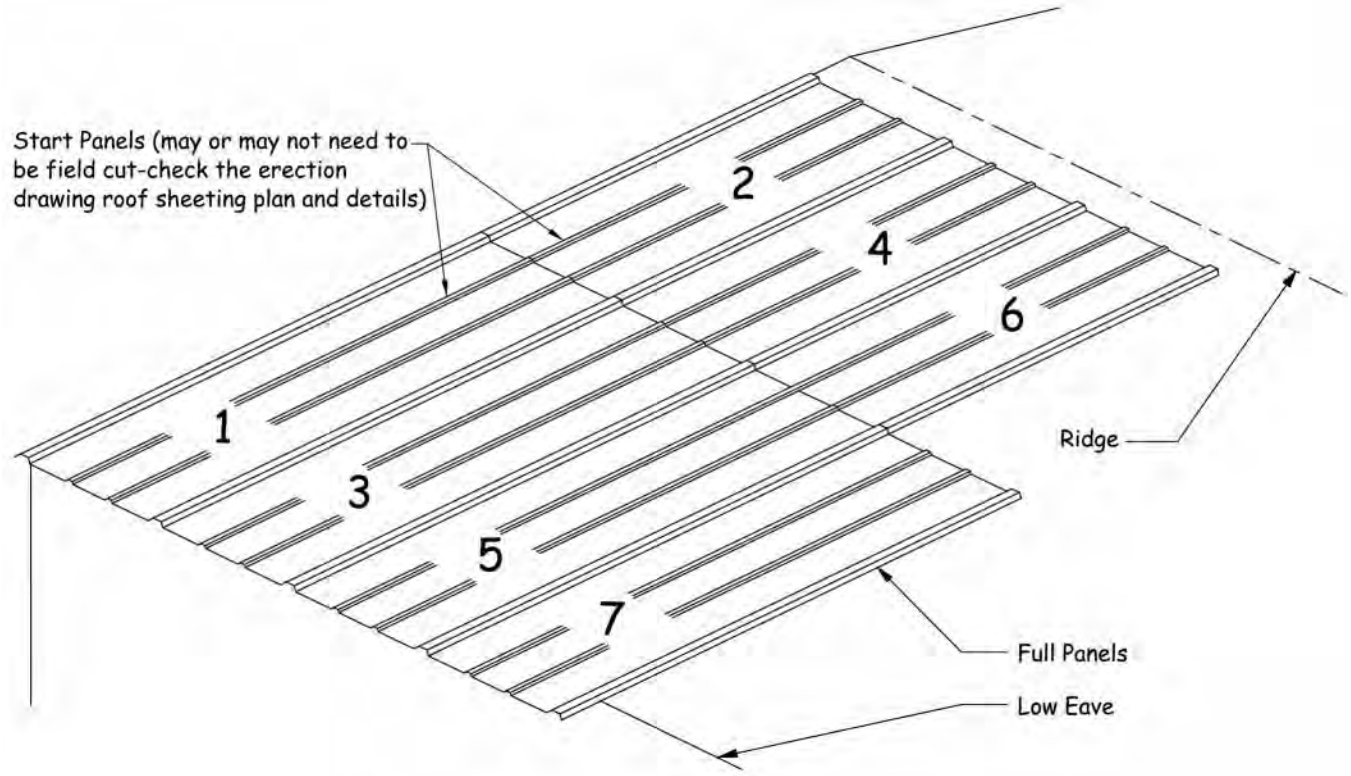
Prior to panel installation and as work progresses, field apply butyl tube caulk around the perimeter of the roof plane.

Additional butyl caulk is required at ALL panel endlaps. **See Section 9.8** for more information.

IMPORTANT NOTE:



9.3 PANEL ORIENTATION & LAYOUT CON'T



9.4 PANEL DESCRIPTION, AND NOMENCLATURE

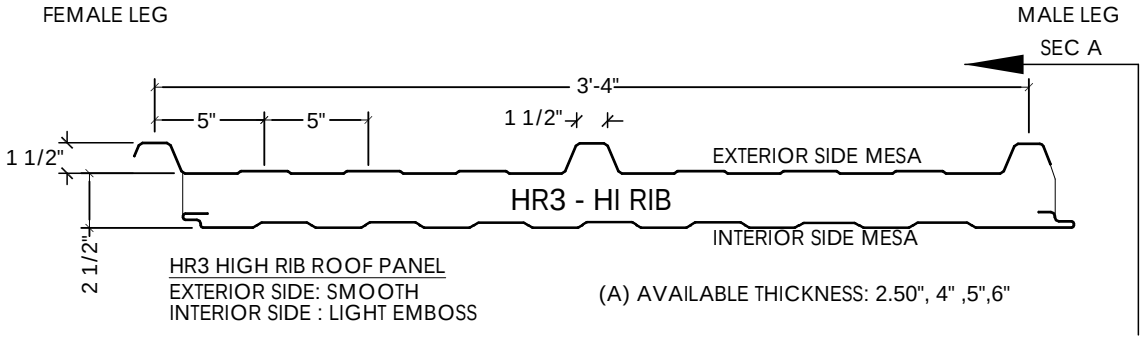
Throughout this manual the references to the panel will be made using the terms in the illustration below. The NBS "HR3" Roof system **IS** a handed roof system. Panel must be erected from left to right.

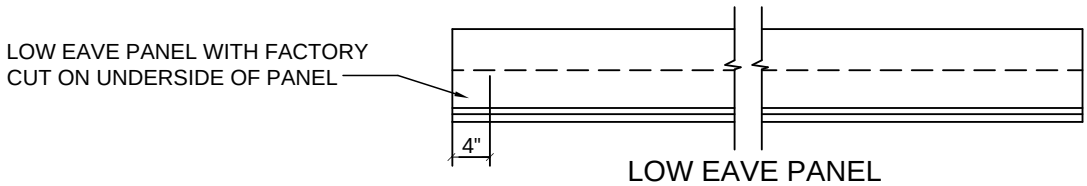
The leading edge of the roof panel is the edge toward the installation direction. On the NBS "HR3" Roof panel, the male seam is always the leading edge.

Before loading the panels onto the roof secondary members, orient the panels so that the male seam is the leading edge

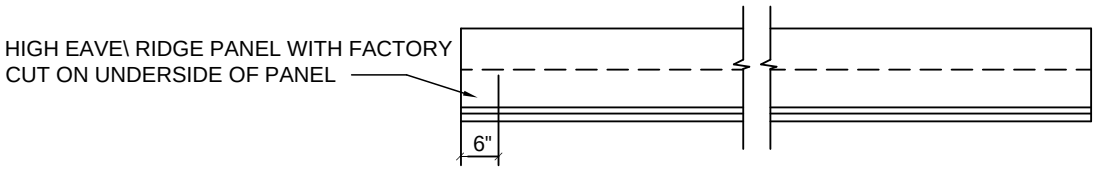
Low eave panels have a **4"** factory saw cut on the underside of the panel. This is to account for the panel over hang. Prior to panel installation, this narrow strip of metal panel and insulation must be removed.

Buildings with a endlap condition, the high eave\ridge panel has a **6"** factory saw cut on the low end of the panel. Prior to endlap\panel installation, this narrow strip of metal panel and insulation must be removed.





LOW EAVE PANEL



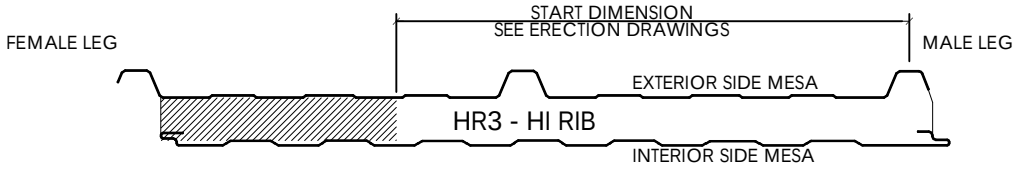
HIGH EAVE\ RIDGE PANEL

SEC. A

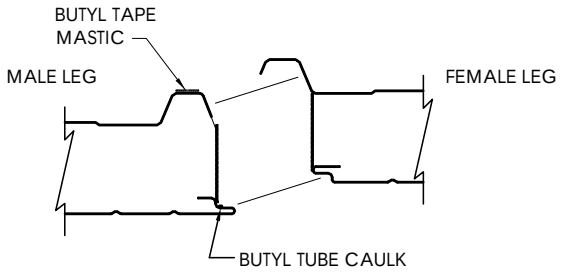
9.5 PANEL PREPERATION

Refer to the erection drawing rake details to determine the required start panel width**. Field cut the start panel to the proper width.**

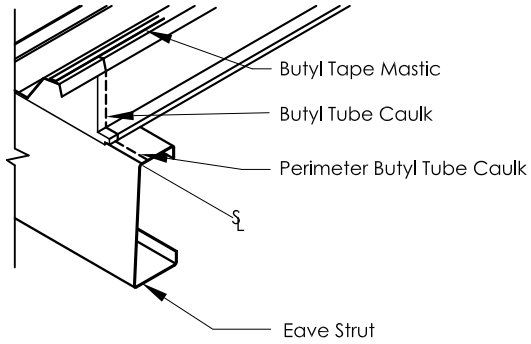
Prior to installing the HR3 panel apply ½" butyl tape mastic (**H3010**) on top of the male rib and butyl tube caulk (**H3151**) to the male panel joint as shown below. Also, apply a marriage bead of butyl tube caulk (**H3151**) in-line with the perimeter caulk as shown below.



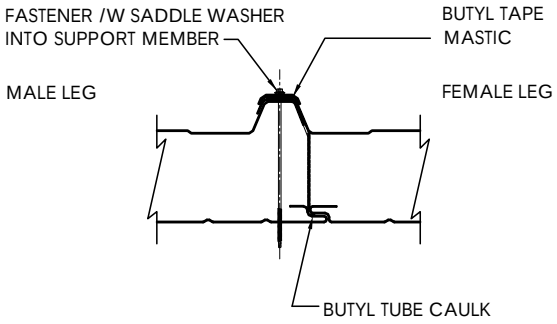
START PANEL (FIELD CUTTING REQUIRED)



HR3 HIGH RIB SIDELAP



MARRIAGE BEAD of BUTYL TUBE CAULK
(LOW EAVE ONLY)



HR3 HIGH RIB SIDELAP ASSEMBLED

9.6 PROPER MASTIC\CAULK INSTALLATION PROCEDURES

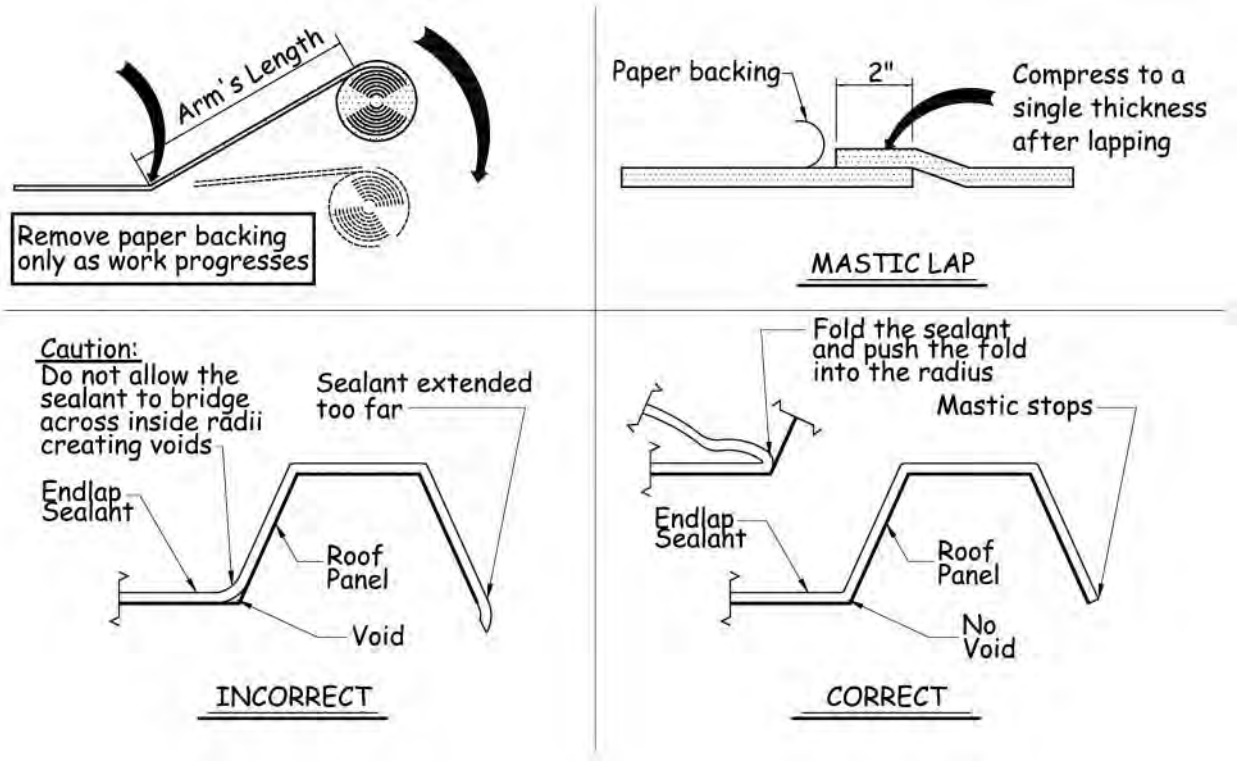
Apply mastic or caulk only to clean, dry surfaces.

Roll mastic out to arm length. Press the mastic firmly in place making sure it is tightly formed to all bends.

Remove paper backing only when ready to install top component.

Splice mastic with a 2" lap. Press lapped pieces of mastic firmly together to form a single thickness.

DO NOT STRETCH MASTIC ACROSS CORNERS. THIS WILL DECREASE THE THICKNESS WHERE IT IS NEEDED THE MOST, AND MAY NOT PERFORM AS DESIGNED.



9.7 LOW EAVE PANEL INSTALLATION:

The roof panel low eave overhang AND panel placement along the building's rake is critical as it establishes the location of gutter, end laps and ridge cap attachment points.

IMPORTANT NOTE:

- **Roof panel overhang dimension: Wall panel thickness + 2 1/2" as shown below.**
- **Low eave 4" roof panel notch does not line up with wall panel steel line**

Prior to panel installation:

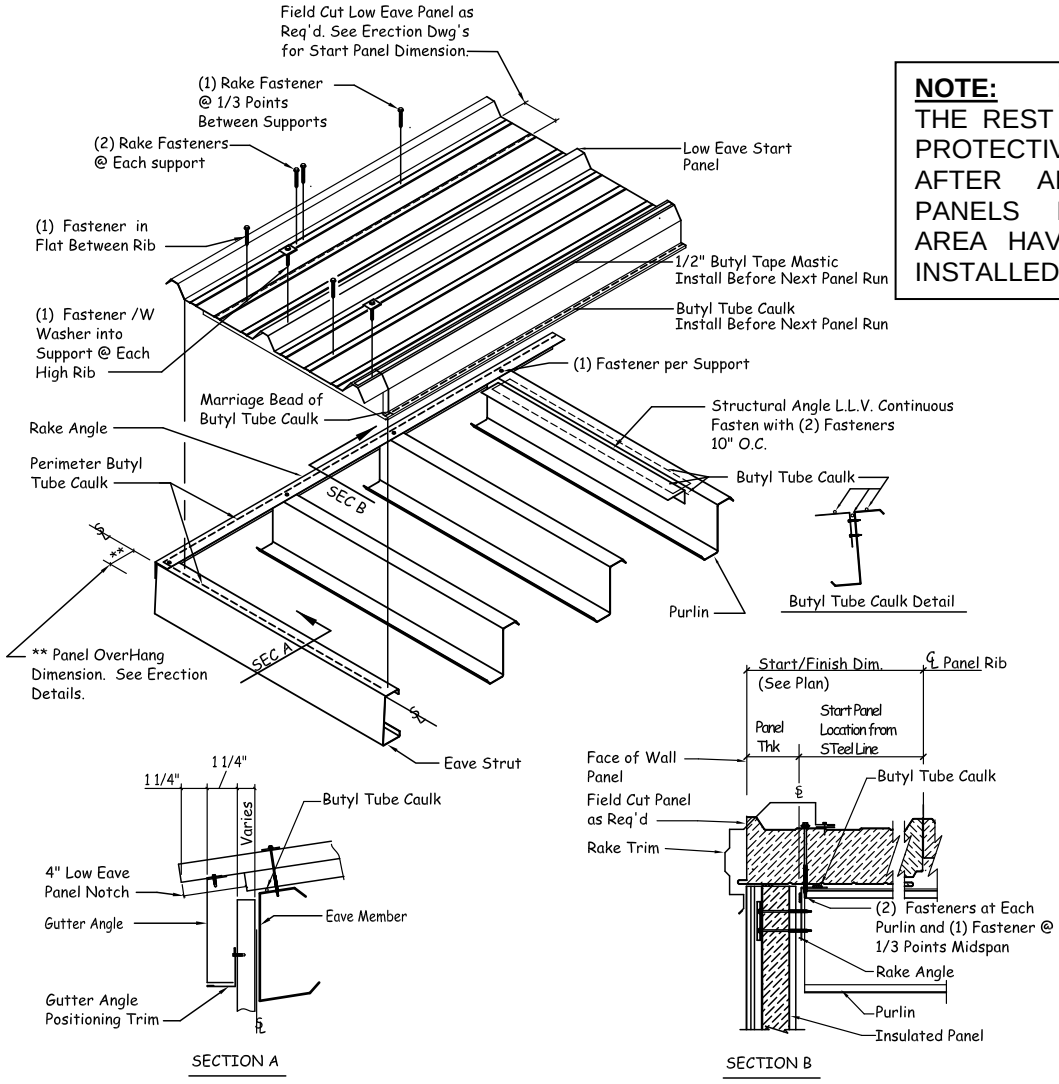
- Strip plastic film from panel side joints and flashing areas (If Applicable).
- Remove the underside 4" of panel and insulation. (Eave Panels have a 4" factory cut)
- Fasten rake angle with (1) (**H1220**) fastener per support
- Install perimeter and panel joint butyl tube caulk (**H3151**) as work progresses.
- Install ½" butyl tape mastic (**H3010**) on top of male rib.
- If building has an endlap, install structural angle at lap purlin **(ELA03).** Caulk behind angle with **H3151** and then fasten to purlin with (**2**) **H1020** fasteners **10" O.C**. Field notch angle at purlin brace as required.
- Caulk structural angle with **H3151** butyl tube caulk as shown. (If Applicable)
- Check panel squareness to the roof secondary framing prior to fastening.

NOTE: Once the panel has contacted the caulking, it should not be moved. Be sure the start panel is properly positioned before seating.

Fasten the start panel at each secondary support member with **(2) ¼- 14** fasteners. Fasten between supports with (1) **(2) ¼- 14** fastener @ 1/3 points.

Fasten panel along low eave into the support member with **(1) ¼-14** washered fastener between each major high rib, and (1) ¼-14 TEK 3 fastener w/washer and saddle washer at each high rib.

On the **low eave** panel apply a marriage bead of butyl tube caulk (**H3151**) as shown below. Repeat on every low eave panel.



NOTE: REMOVE THE REST OF THE PROTECTIVE FILM AFTER ALL THE PANELS IN THE AREA HAVE BEEN INSTALLED.

9.8 INTERMEDIATE PANEL AND ENDLAP INSTALLATION

- Prior to installing the ridge panel place (3) beads of butyl tube caulk (**H3151**) onto the lap purlin/angle as shown. Marry the two beads of caulk on each end.
- The high eave/ridge panels have a 6" factory cut on the underside of the panel. Remove this underside 6" of panel and insulation.
- Strip plastic film from panel side joints and flashing areas (If Applicable).
- Install ½" butyl tape mastic (**H3010**) on top of male rib.
- Install perimeter and panel joint butyl tube caulk (**H3151**) as work progresses.
- Apply (1) row of ½" butyl tape mastic (**H3010**) and (1) bead H3151 butyl. As shown onto lower panel.
- Check panel squareness to the roof secondary framing prior to fastening.

NOTE: Once the panel has contacted the caulking/ mastic, it should not be moved. Be sure the panel is properly positioned before seating.

Intermediate START Panel:

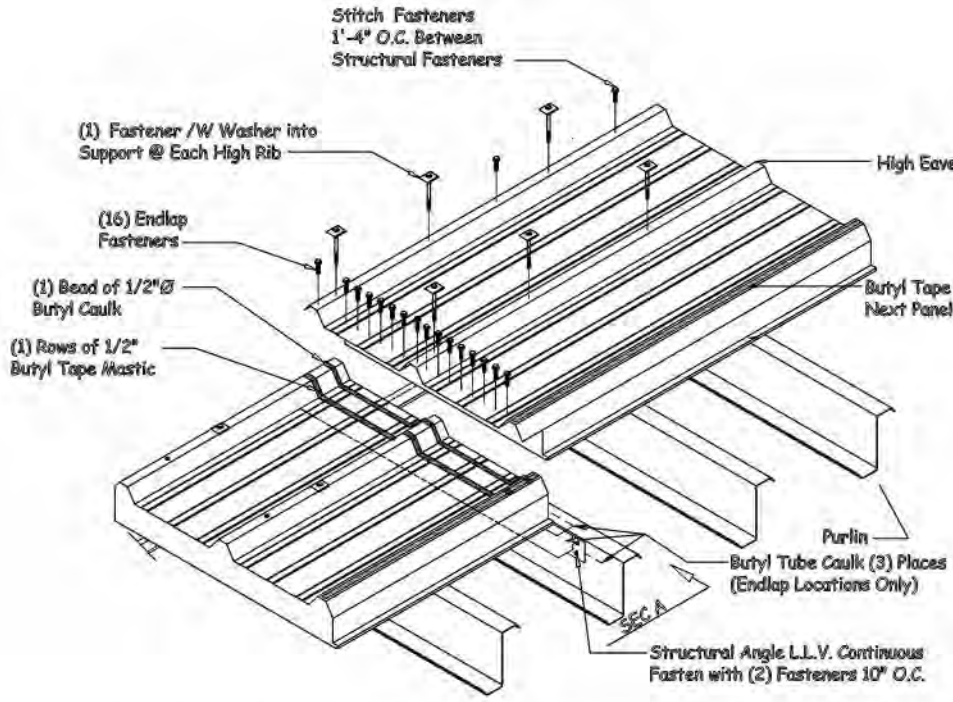
Fasten the intermediate start panel at each secondary support member at rake with **(2) ¼- 14** fasteners w/washer and fasten between supports with **(1) ¼- 14** fastener @ 1/3 points.

Intermediate Panel:

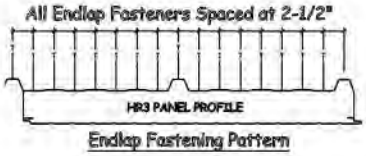
Structural Fasteners- Fasten panel @ high rib to each support member with **(1) ¼-14** fasteners w/ washer.

Sidelap Fasteners- Fasten panel sidelaps with **(1) (H1050)** 1'-4" O.C. (between structural fasteners).

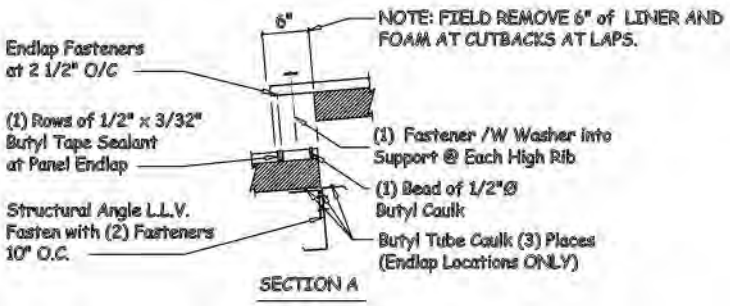
Endlap: Fasten endlap with **(16) H1050** fasteners spaced 2 ½" O.C. **(Fasteners must pass through tape Mastic)**



NOTE: REMOVE REMAINING PROTECTIVE FILM PRIOR TO INSTALLATION. IF SUCTION DEVICE IS USED TO MOVE PANELS IN PLACE, ENSURE ALL FILM HAS BEEN REMOVED PRIOR TO TRANSPORT.



Endlap Fastening Pattern



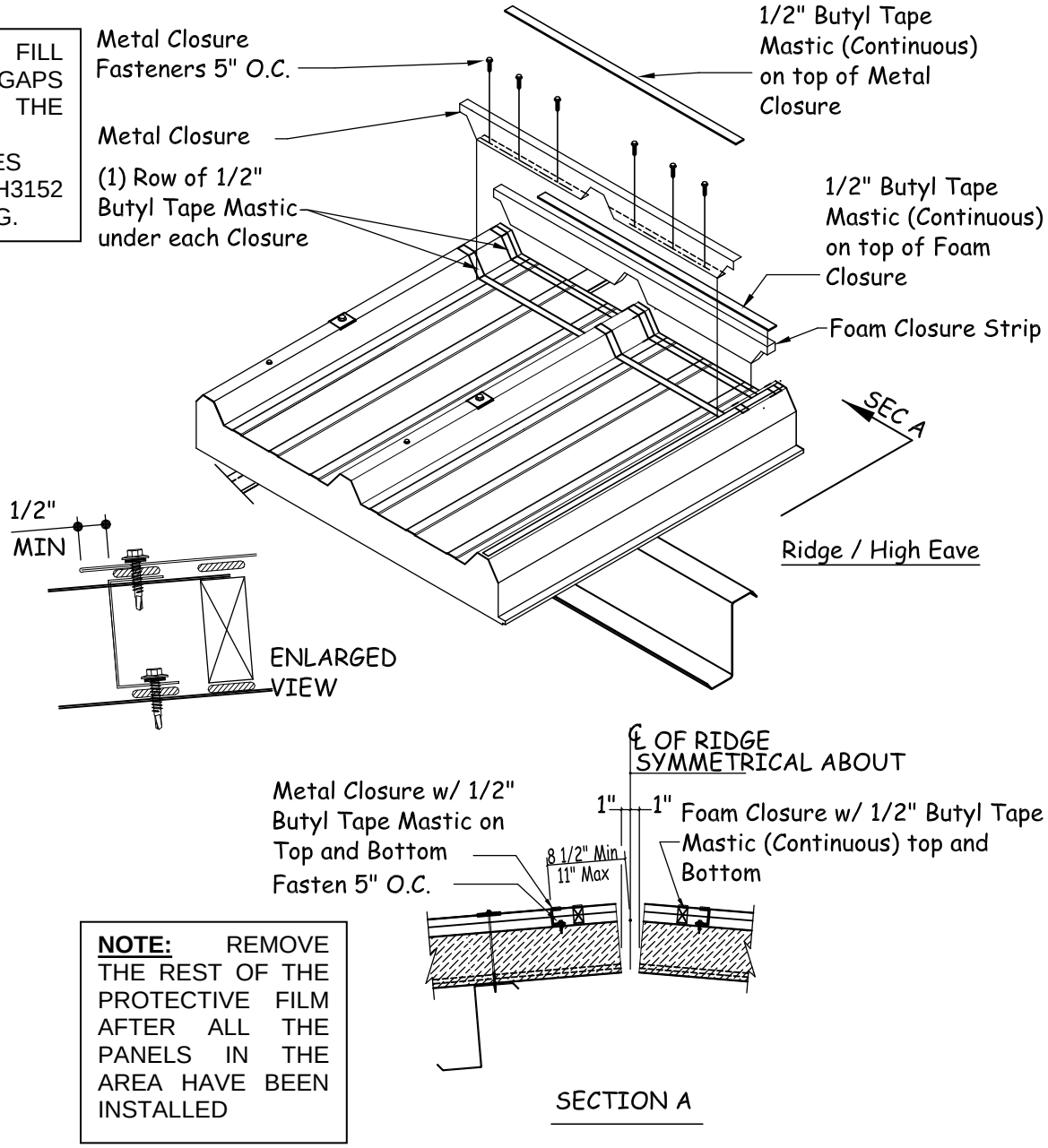
SECTION A

9.9 INSTALLATION OF THE RIDGE CLOSURE

NOTE: Install **start** panel closure after rake trim has been installed (See Sec. 12.5 for Info).

Before installing the Metal Closure, place a strip of ½" Butyl Tape Mastic (H3010) *continuously* on the panel. Place Tape mastic/ Closure Strips at: **Minimum of 8 ½" / Maximum 11"** from centerline of ridge (as shown below). Remove paper backing from this tape mastic and set metal closure. Fasten to HR3 panel with **H1050** fasteners 5" O.C. Repeat similar process with tape mastic and foam closure (Location not critical)(No fasteners required). Next, apply ½" Butyl Tape Mastic (**H3010**) *continuously* along the tops of both closures. Remove paper backing on tape mastic as the installation of the ridge cap progresses.

NOTE: FILL ALL GAPS WITHIN THE METAL CLOSURES WITH H3152 CAULKING.



NOTE: REMOVE THE REST OF THE PROTECTIVE FILM AFTER ALL THE PANELS IN THE AREA HAVE BEEN INSTALLED

10.0 PREPARATION FOR ROOF LINE TRIM INSTALLATON

10.1 PREPARATION FOR TRIM INSTALLATON

BEFORE PROCEEDING WITH THE ROOF LINE TRIM INSTALLATION, WALK THE ROOF PAYING PARTICULAR ATTENTION TO THE FOLLOWING AREAS:

All panel splices are straight, and all fasteners are installed.

All protective plastic has been removed.

All ridge zee trims are in place and properly fastened.

All ridge zee trims are the same height.

Any gaps between panel and ridge zee trims have been properly filled with caulk.

All metal shavings and debris have been removed from the roof.

All perimeter fasteners are in place and properly tightened. The rubber washer should be visible all around the fastener.

10.2 GENERAL

Begin installing trim at the back of the building working toward the front. This will "hide" the trim laps from direct view.

When lapping **rake trim** and **rake parapet trim**, the upper piece should overlap the lower piece. This will help prevent water from entering into the building through the lap.

Gutter/Rake Trim (GRA01) must be installed prior to the installation of the low eave trim.

Some field cutting, trimming, and bending is required. **Extreme care must be taken while performing any fieldwork so as to produce an attractive, weather-tight condition.**

Refer to you project erection drawings and the following pages for trim part numbers.

NOTE: Polyurethane tube caulk (H3152) is used at all trim laps **except at the ridge cap.** The ridge cap utilizes the butyl tube caulk **(H3151).** It is important that the correct caulk be used. Careful attention to all details are a must.

This section is broken down into individual trim conditions. Not all of these conditions may apply to your project. Refer to the erection drawing roof sheeting plan(s) and the roof line trim details to identify the conditions your project requires.

If there are discrepancies between this manual and the erection drawings, the erection drawings will take precedence. It is a good idea to compare the erection drawing details against this manual before trim installation begins.

Refer to the following pages for standard roof line trim profiles for assistance in the correct selection and identification of roof line trim parts. For proper fit-up, sealing and fastening, and to help ensure the roof assembly's weather-tightness, structural capability, durability and appearance, the correct parts must be used. **DO NOT** use parts other than those specified in this manual or on the erection drawings without consulting Nucor.

Before installing any roof line trim, the wall panel (or whatever wall material is being used) must been erected.

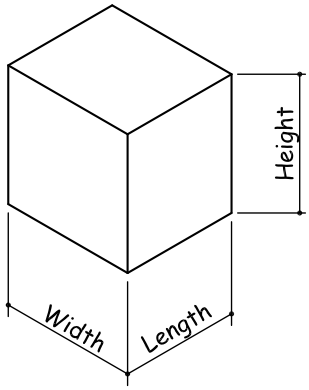
11.0 STANDARD ROOF LINE TRIM PARTS GENERAL

This section is intended to show you diagrams of the trim parts that are used in this section of the manual. These parts cover the standard conditions. The erection drawing details will cover the special conditions.

It is a good idea to check the erection drawing details against the details in this section. If there are discrepancies, the erection drawings will take precedence.

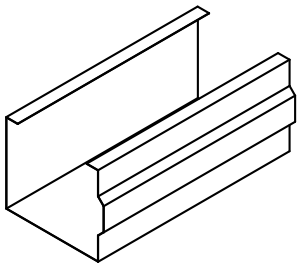
DIMENSION INFORMATION

The detail at right shows how the standard parts are dimensioned. Note that the dimensions given are nominal. Some parts do not have all 3 (length, width, height) dimensions given, as they may not be relevant.



GUTTER

26 Gauge Steel
Painted

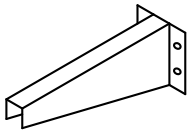


Length = 10'-1," 20'-2"
Width = 8 1/8"
Height = 7"

Part Number
GTA01 - 10'-1"
GTA02 - 20'-2"

GUTTER BRACKET

18 Gauge Steel
Aluminized
Factory Punched Holes

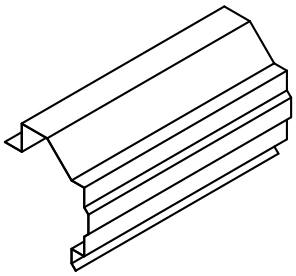


Length = 8 1/8""
Width = 1"
Height = 3"

Part No. H2210

SCULPTURED RAKE TRIM

26 Gauge Steel
Painted

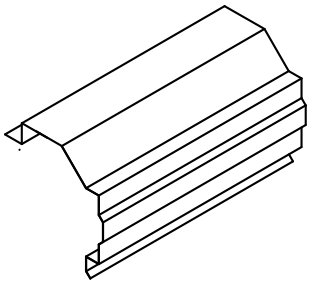


Length = 10'-1", 20'-2"
Width = 9 3/8"
Height = 12"

Part Number
RTA01 - 10'-1"
RTA02 - 20'-2"

SCULPTURED HIGH EAVE TRIM

26 Gauge Steel
Painted

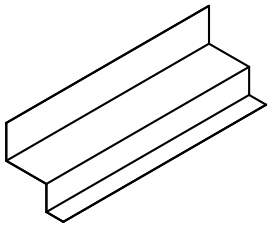


Length = 10'-1", 20'-2"
Width = 9 3/8"
Height = 12"

Part Number
HEA01 - 10'-1"
HEA02 - 20'-2"

RAKE PARAPET TRIM

26 Gauge Painted (Std.)



Length = 10'-1"
Width = 6 1/2""
Height = 7"

Part No. RPI11

11.0 STANDARD ROOF LINE TRIM PARTS

WALL OUTSIDE CORNER TRIM

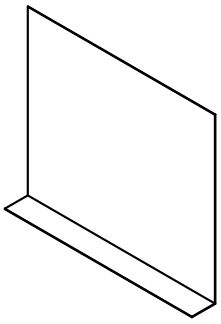
26 Gauge Steel
Painted Silicone Poly Finish

Length = 10'-1"
Width = Varies
Height = Varies

Part No. OCI__

GUTTER/RAKE TRIM

26 Gauge Steel
Painted Silicone Poly Finish

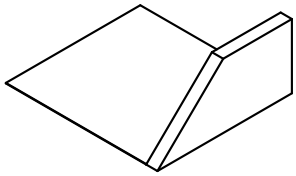


Length = 8"
Width = 1"
Height = 7"

Part No. GRA01

RAKE END CAP - LEFT

26 Gauge Steel
Painted Silicone Poly Finish

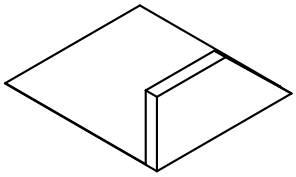


Length = 6"
Width = 6"
Height = 2 3/4"

Part No. RCA01

RAKE END CAP - RIGHT

26 Gauge Steel
Painted Silicone Poly Finish

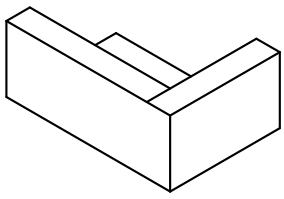


Length = 6"
Width = 6"
Height = 2 3/4"

Part No. RCA02

RAKE PARAPET END CAP - LEFT

26 Gauge Steel
Painted Silicone Poly Finish

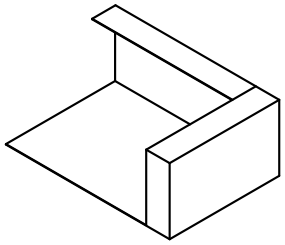


Length = 4 3/4"
Width = 7"
Height = 1 3/8 "

Part No. RCI11

RAKE PARAPET END CAP - RIGHT

26 Gauge Steel
Painted Silicone Poly Finish



Length = 4 3/4"
Width = 7"
Height = 1 3/8"

Part No. RCI12

12.0 ROOF LINE TRIM INSTALLATION

ERECTOR NOTE:

FOR COMPLETE HORIZONTAL GUTTER INSTALLATION SEE THE ERECTION SET OF DRAWINGS.

12.1 LOW EAVE CORNER AND STANDARD RAKE TRIM INSTALLATION

Temporarily place rake trim on end of the roof panel and up the rake (over wall panel). Mark on the roof panel at the location of the rake cap. Use a felt tipped marker. (Do not use a pencil)
Apply **polyurethane tube caulk (H3152)** to ALL sides of the **rake cap** and place it were marked on the end of the panel. No fasteners are required for the rake cap at this time.

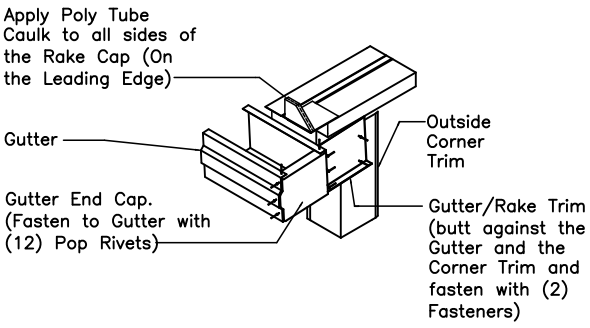
RAKE CAP PART NUMBERS	RAKE TRIM PART NUMBERS	RAKE PARAPET CAP PART NUMBERS
• **RCA01 (LEFT)**	• **RTA01 x 10'-1"**	• **RCI11 – (LEFT)**
• **RCA02 (RIGHT)**	• **RTA02 x 20'-2"**	• **RCI12 – (RIGHT)**

Before proceeding with the standard rake trim installation, make sure that the **gutter end cap (GEC__), gutter/rake trim (GRA01),** and **rake cap (RCA__)** have been installed. Fasten the gutter end cap (**GEC**__) with (12) (**H1100**) pop rivets. For the rake parapet end caps fasten with (**7**) **H1050** fasteners.

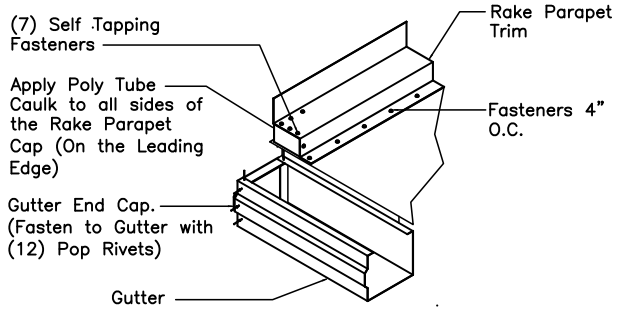
Next, apply continuous **2 ¼" tape mastic (H3020)** to the bottom of the horizontal leg of the rake trim (the leg that attaches to the roof panel).

All parts must be positioned properly before touching the mastic to the roof panel. Mastic cannot be reused.

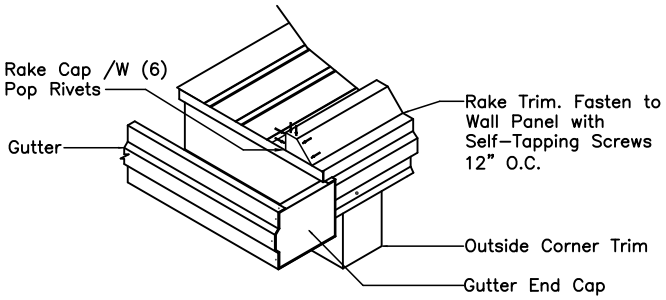
Position the rake flash so that the low eave end is flush with the end of the roof panel. Always start the rake trim installation at the low eave working toward the high eave or ridge. Fasten rake trim to the roof panel with trim colored **H1050** at 4" O.C. Fasten rake trim to the wall panel with trim colored **H1060** fasteners 12" O.C.
Cope the bottom vertical leg of the rake trim flush with the backside of the gutter.



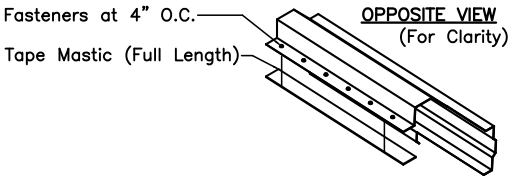
GUTTER AND RAKE END CAP DETAIL



GUTTER AND RAKE PARAPET END CAP DETAIL



FINISHED DETAIL



RAKE TRIM PREP DETAIL
Rake Trim Shown, Rake Parapet Trim Similar

12.2 GUTTER LAP DETAIL

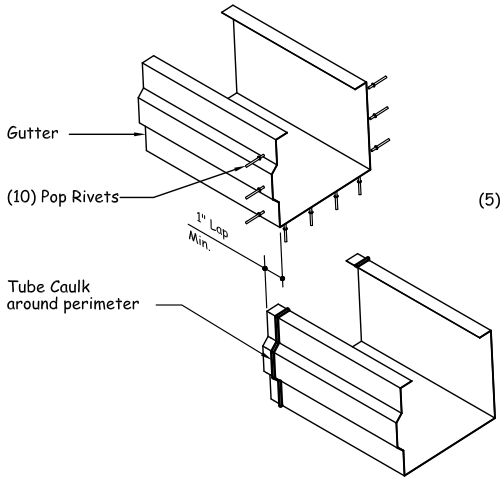
Lap gutter 1", sealing with a continuous bead of **polyurethane tube caulk (H3152)** to the end of the adjoining piece. Fasten with (10) **pop rivets (H1100).**

12.3 RAKE TRIM LAP DETAIL

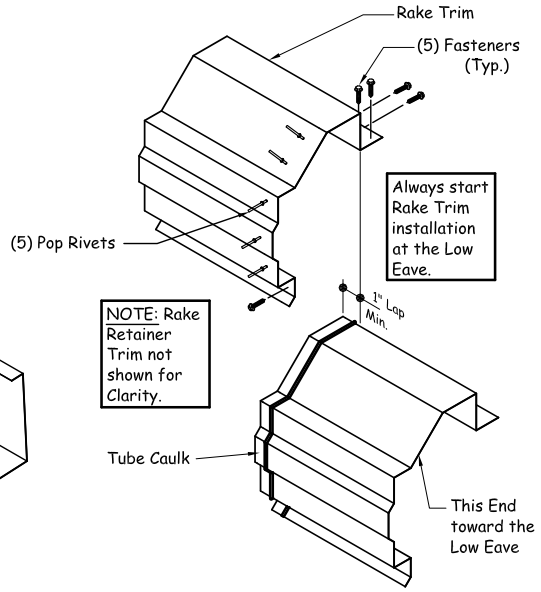
Lap the rake trim 1", sealing with a continuous bead of **polyurethane caulk (H3152)** to the end of the adjoining piece. Fasten with (5) trim colored **screws** and (5) **pop rivets (H1100)**.

12.4 RAKE PARAPET TRIM LAP DETAIL

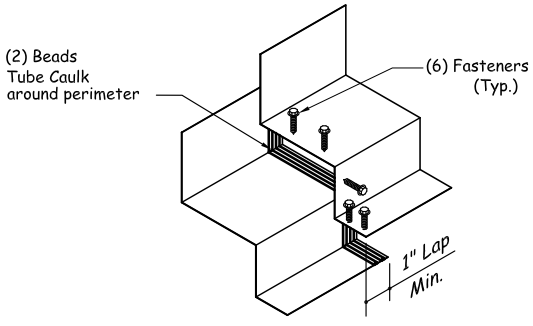
Lap the rake parapet trim 1", sealing with (2) continuous beads of **polyurethane caulk (H3152)** to the end of the adjoining piece. Fasten with (5) trim colored **screws**.



GUTTER LAP DETAIL



RAKE TRIM LAP DETAIL



RAKE PARAPET TRIM LAP DETAIL

12.5 STANDARD RAKE TRIM TERMINATION AT RIDGE

If your building has a **ridge (or single slope)**, extend the standard rake trim flush with the end of the roof panel.

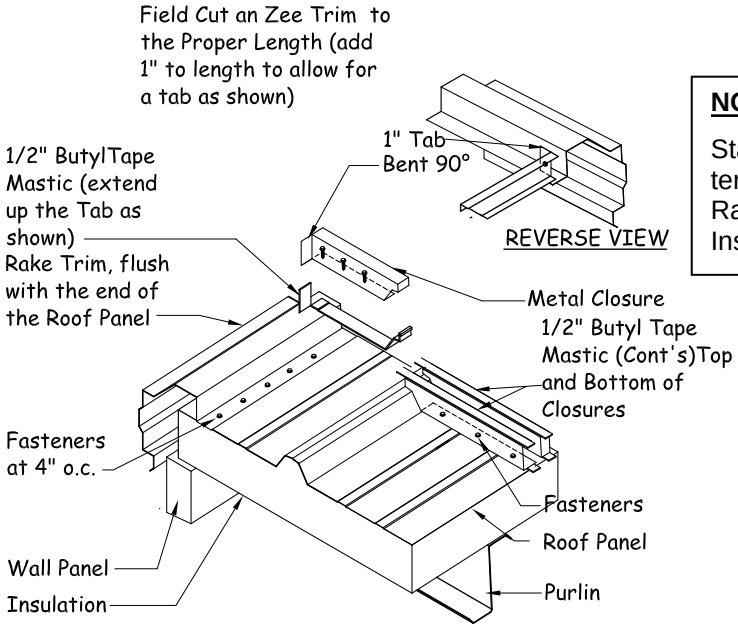
NOTE: On a Ridge Parapet Trim condition, extend parapet trim 6" past ridge line to create a ridge transition. Field work and caulk (Use poly tube caulk **H3152**) at ridge to ensure weathertightness.

Field cut a **Metal Closure with a 1" tab** to fit between the rake trim and the panel rib. The tab is to attach the Zee Trim to the rake trim. Cut foam **Outside Closure Strip** to fit.

Apply a part of a piece of **½" Butyl Tape Mastic (H3010)** to the roof panel at the location of the Metal Closure. Be sure that the tape mastic forms tightly to all bends. The mastic must also extend up the rake trim between the tab in the Zee Trim and the rake trim (or parapet trim). Attach tab to the rake trim to (or parapet trim) with (**1**) (**H1050**).

Apply a bead of **Butyl Tube Caulk (H3151)** in the rib area of the panel and along the back leg of the rake trim (or parapet trim). The caulk should be adjacent to and up-slope from the tape mastic.

Fasten the **Metal Closure** 5" O.C. with self-drilling **screws (H1050). No fasteners required for foam closure.**

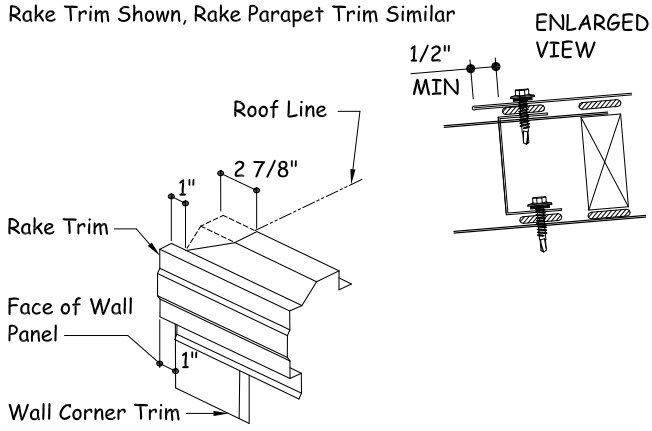


NOTE:

Standard Rake Trim termination shown, Rake Parapet Trim Installation similar.

Rake Trim Termination

Rake Trim Shown, Rake Parapet Trim Similar



Single Slope Rake Trim Termination

12.6 RAKE PARAPET TRIM AT HIGH EAVE PARAPET TRIM INSTALLATION

Apply **1/2" tape mastic (H3010)** continuously across the top of both Closures. Remove paper backing only as work progresses**. The trim must be properly positioned before touching the mastic. Mastic cannot be reused.**

HIGH EAVE PARAPET PART NUMBERS

- **HTI__ x 10'-1"**

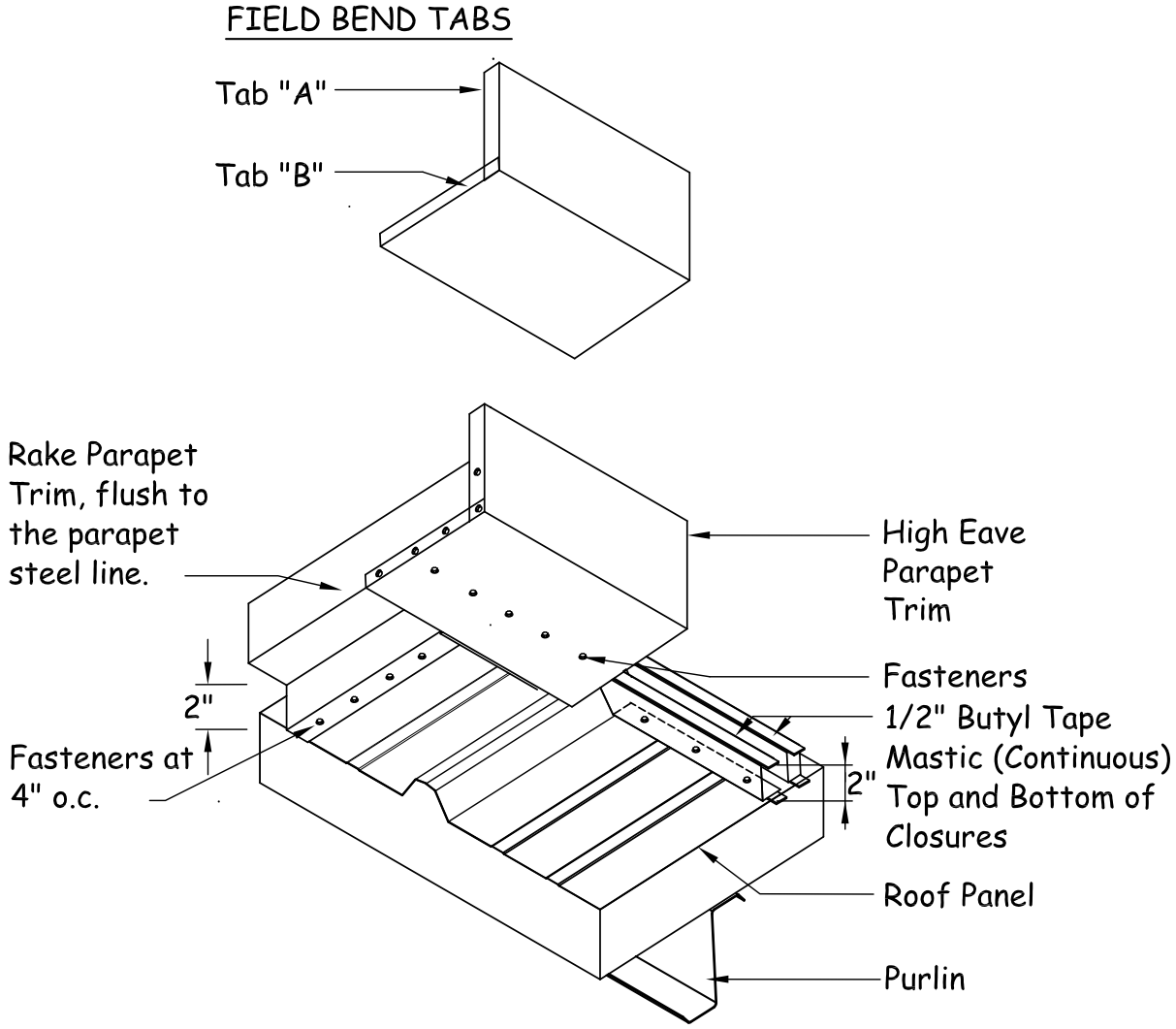
(**Note:** The third digit of the part number varies with the roof slope. Refer to the erection drawing details for exact part number.

Scribe a line 4 3/4" in from the end of the high eave parapet trim. Make a "through" cut at all bends to form tabs **"A" and "B** as shown below. Bend tabs as shown below.

Apply **polyurethane tube caulk (H3152)** around the perimeter of all tabs and place the high eave parapet trim over the rake parapet Trim and fasten with (5) trim-colored self-drilling screws **(H1050)** Fasten high eave parapet trim **5" O.C. at each** Metal Closure.

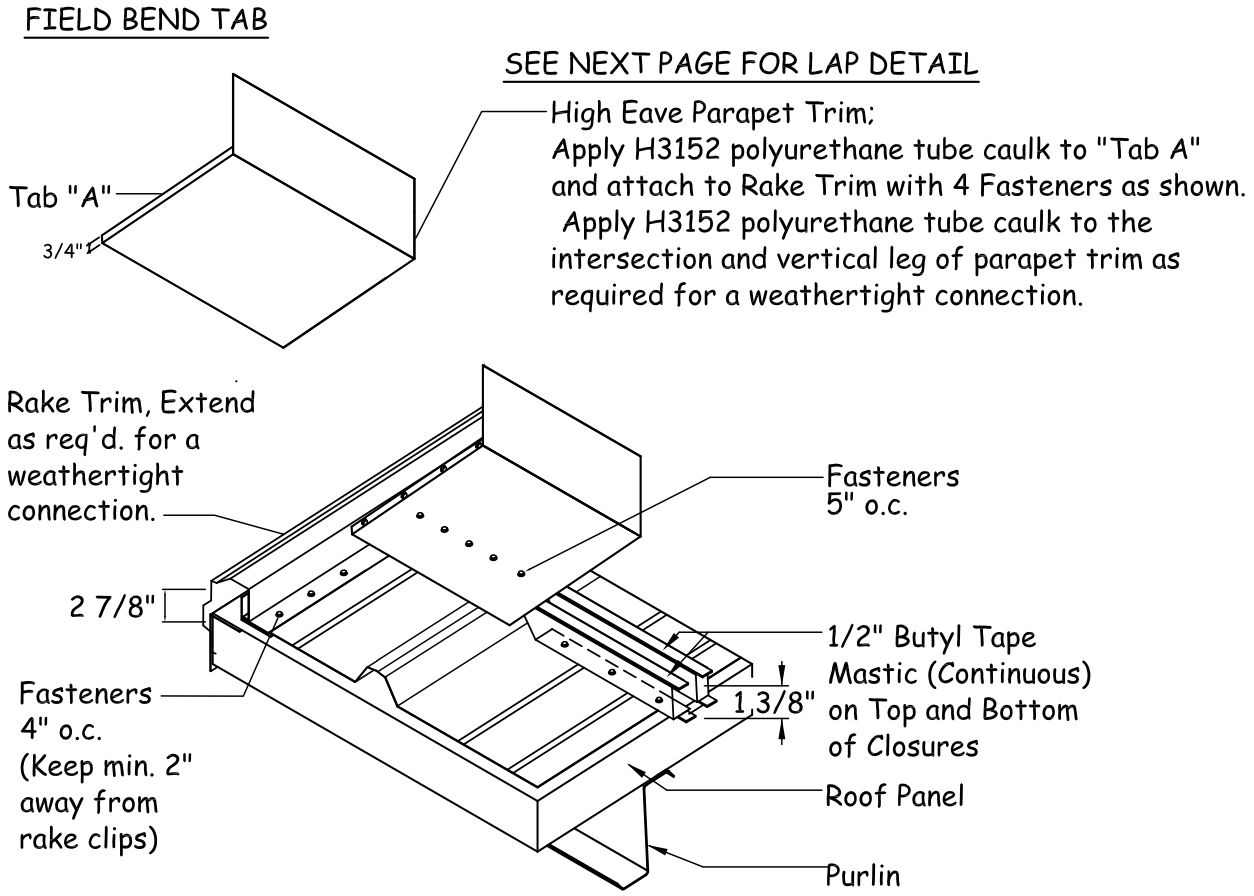
Fasten the high eave parapet trim to the rake parapet trim with (8) trim-colored self-drilling **screws (H1050)**.

Refer to the erection drawing details for the high eave parapet trim attachment to the wall



12.7 SCULPTURED RAKE TRIM AT HIGH EAVE PARAPET TRIM INSTALLATION

Field cut Tab A as shown below. Apply **½" butyl tape mastic** (**H3010**) to tab. Caulk all edges to ensure weather tightness as required with **polyurethane tube caulk (H3152).** Fasten to rake trim with **H1050** fasteners.



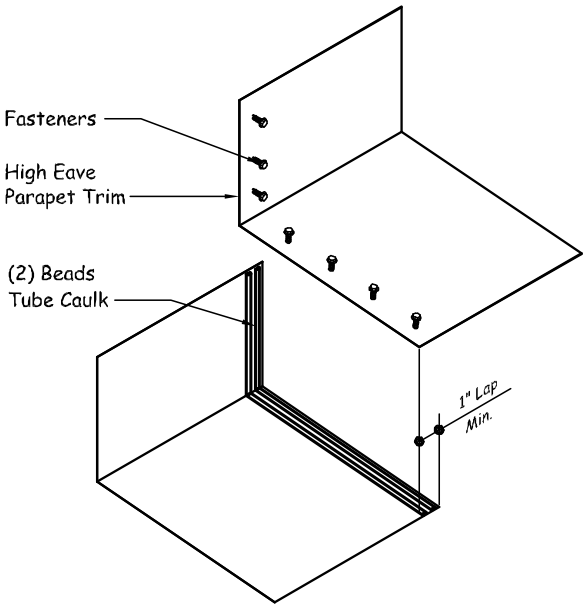
12.8 HIGH EAVE TRIM LAP DETAILS

High Eave Parapet Trim:

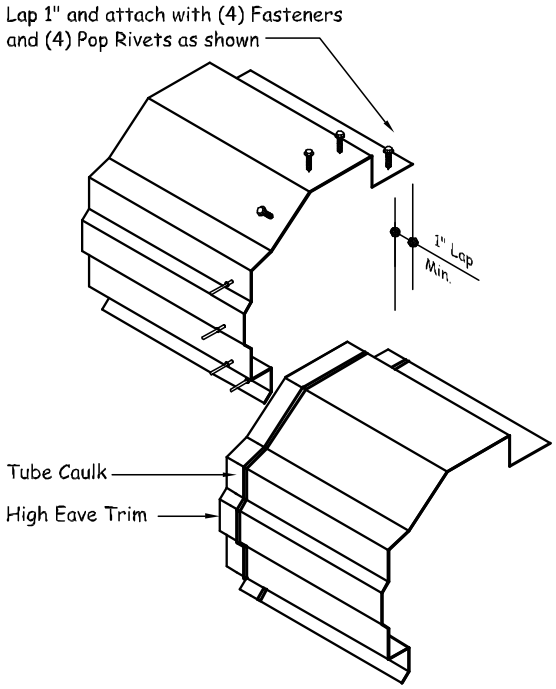
Lap the high eave trim by applying (2) continuous beads of **polyurethane tube caulk (H3152)** to the end of the adjoining trim piece and lap 1". Fasten with (7) trim-colored self-drilling **screws (H1050).**

High Eave Trim:

Lap the high eave trim by applying a continuous bead of **polyurethane tube caulk (H3152)** to the end of the adjoining trim piece and lap 1". Fasten with (4) trim-colored self-drilling **screws (H1050)** and (4) **pop rivets (H1100)**



High Eave Parapet Trim Lap



High Eave Trim Lap

12.9 SCULPTURED HIGH EAVE TRIM INSTALLATION

Before installing the high eave trim, apply **polyurethane tube caulk (H3152)** around the perimeter of the **corner cap (H4000)**. Slide the cap into the end of the standard rake trim, leaving **½"** exposed as shown below.

Apply **1/2" Butyl tape Mastic (H3010)** continuously across the Zee Trim. Remove paper backing only as work progresses.

Lay the **high eave trim** over the Zee Trim and fasten with (5) trim-colored self-drilling **screws (H1030)**. **NOTE: The high eave parapet trim must be properly positioned before touching the mastic. Remove the paper backing only as work progresses.**

SCULPTURED HIGH EAVE TRIM PART NUMBERS

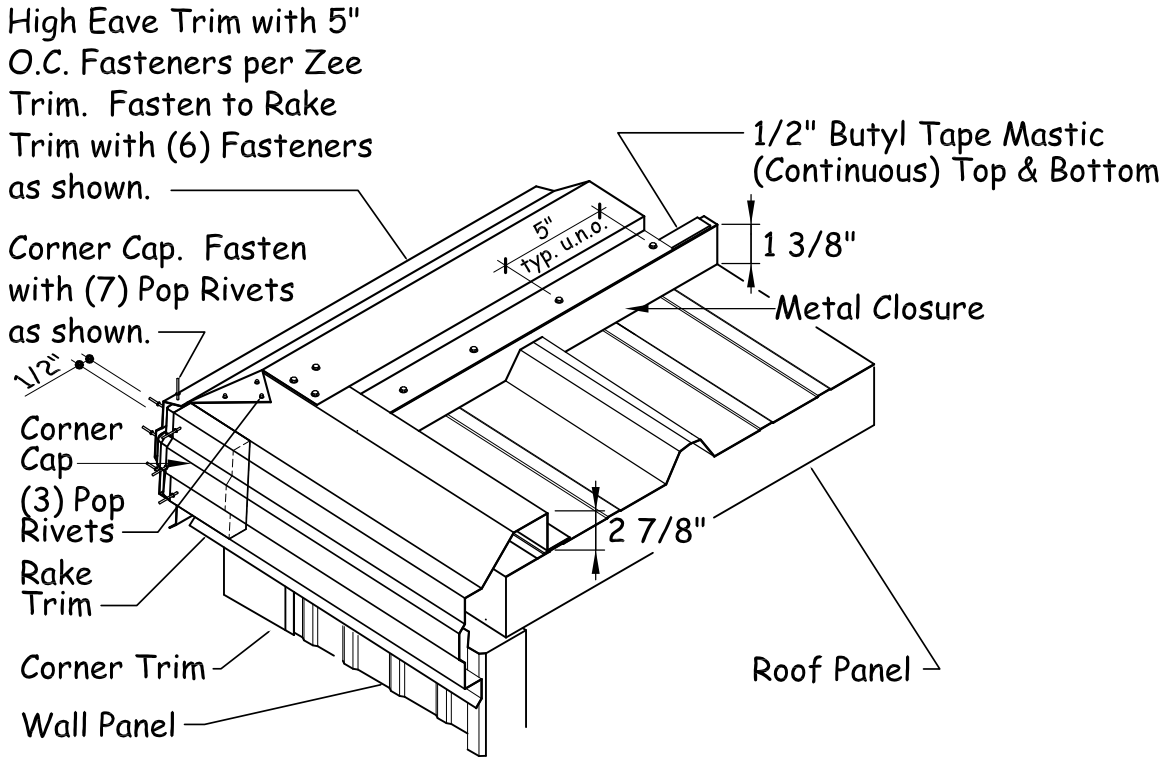
- **HEA01 X 10'-1"**
- **HEA02 X 20'-2"**

Field cope the high eave trim similar to the rake trim except do not cut the sloped face. Instead, fold the sloped face over the sloped face of the rake trim. Caulk all around with **polyurethane tube caulk (H3152)** and fasten with (3) **pop rivets (H1100)**.

Fasten the high eave trim and the rake trim to the corner cap with (7) **pop rivets (H1100)**. Fasten the top leg of the high eave trim with (6) trim-colored self-drilling **screws (H1050)**.

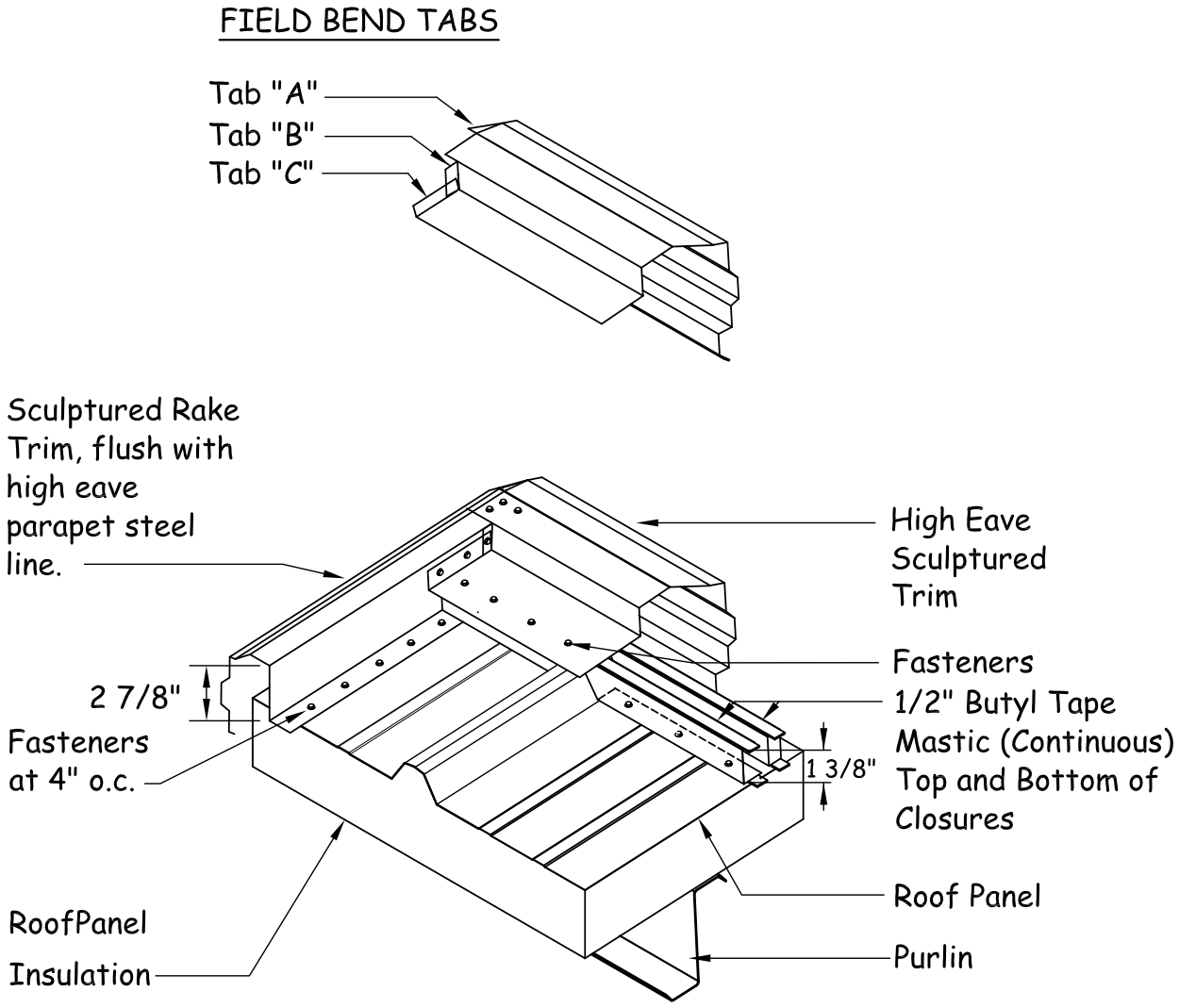
Fasten high eave sculptured trim **5" O.C. at each** Metal Closure with (H1050) fasteners.

NOTE:
Field bend the top leg of the High Eave trim over the sloped leg of the Rake Trim and attach with (3) Pop Rivets.



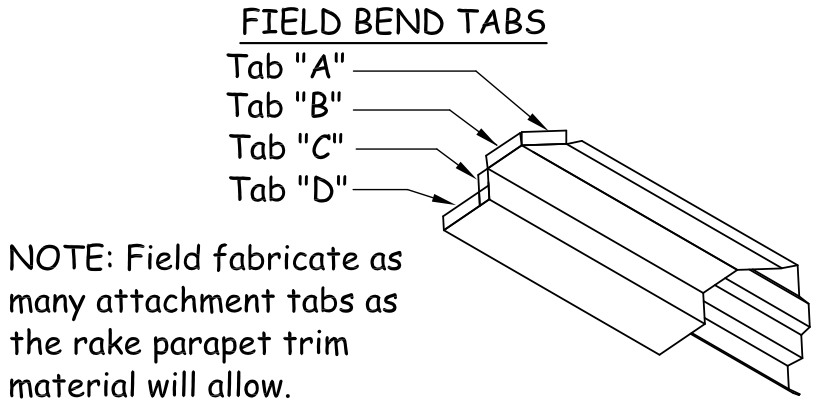
12.10 SCULPTURED HIGH EAVE TRIM AT SCULPTURED RAKE TRIM

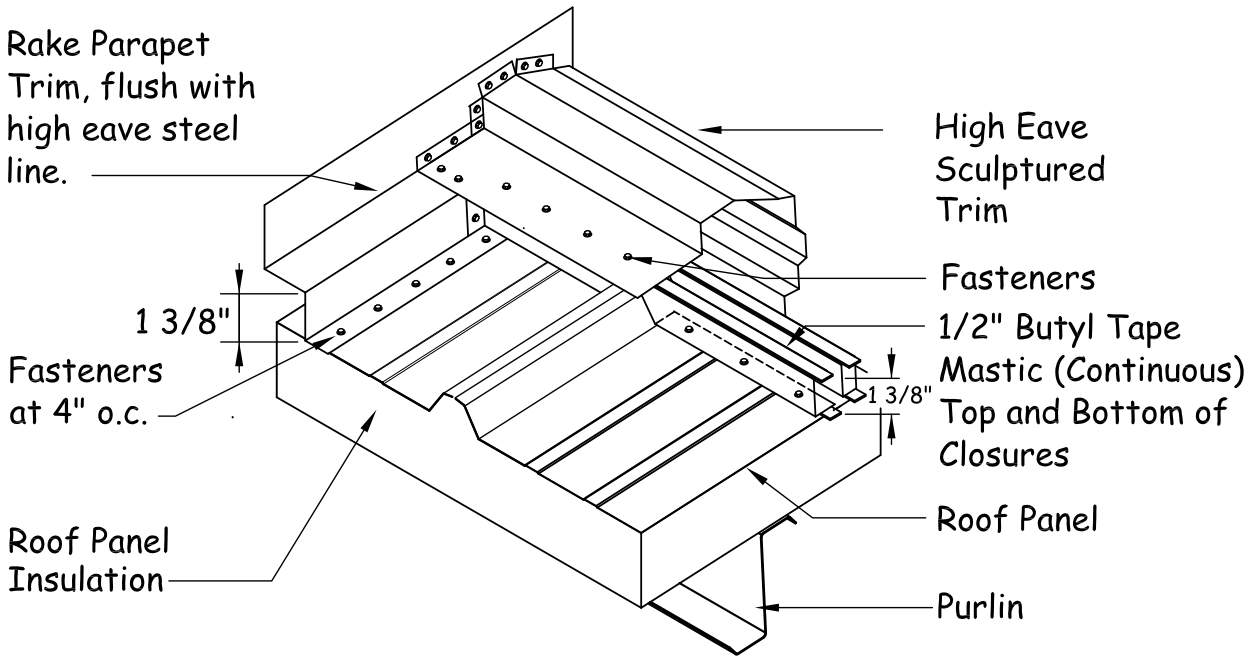
Field cut Tab A, B, and C as shown below. Apply **½" butyl tape mastic** (**H3010**) to tabs. Caulk all edges on all tabs to ensure weather tightness as required with **polyurethane tube caulk (H3152).** Fasten to rake trim with **H1050** fasteners.



12.11 HIGH EAVE SCULPTURED TRIM AT RAKE PARAPET TRIM

Field cut Tabs A, B, C, & D as shown below. Apply **½" butyl tape mastic** (**H3010**) to all tabs. Caulk all edges to ensure weather tightness as required with **polyurethane tube caulk (H3152).** Fasten to rake parapet trim with **H1050** fasteners.





12.12 METAL PEAK BOX INSTALLATION AT RIDGE CAP

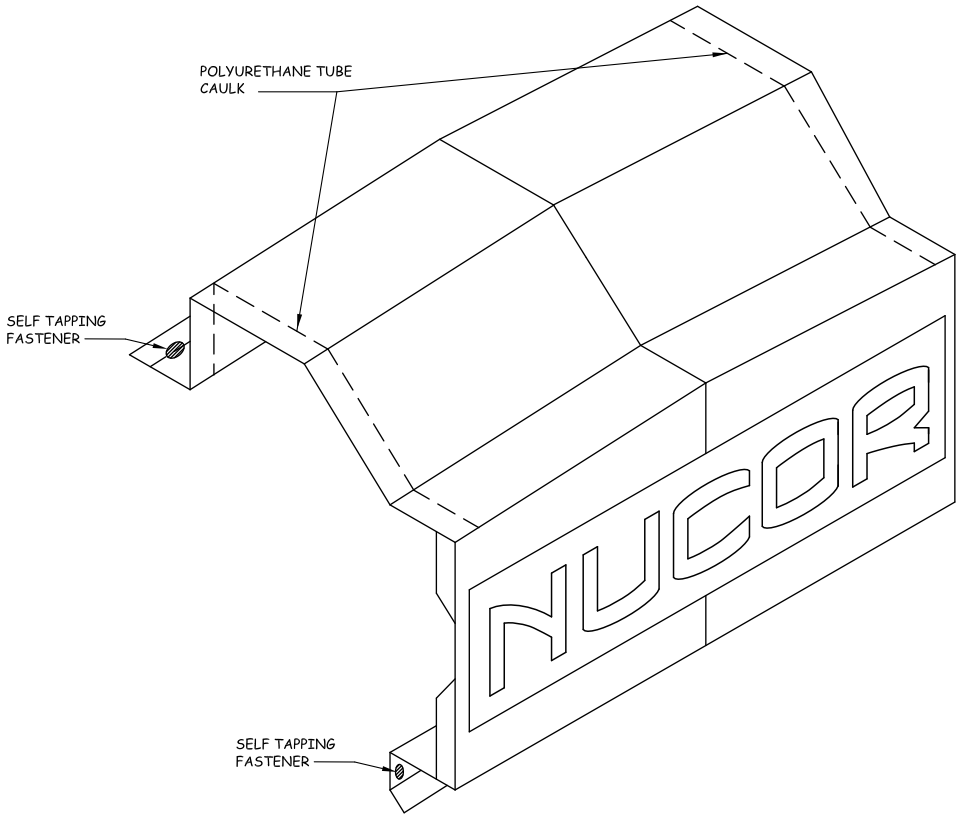
The metal peak box must be installed **before** the low profile ridge cap. After peak box has been installed refer to Section 12.00 install the ridge cap.

Apply **polyurethane tube caulk (H3152)** as shown below and on the underside of the back lip of the **metal peak box**. Apply **polyurethane tube caulk (H3152)** to any gaps on the underside of the peak box in the mitered area.

Position the metal peak box over the rake trim and fasten with (8) trim colored **self-drilling screws (H1050)**

PEAK BOX PART NUMBERS:

Roof Slope	Peak Box
.5:12	MPB50
1:12	MPB01
2:12	MPB02
3:12	MPB03
4:12	MPB04
5:12	MPB05
6:12	MPB06



12.0 STANDARD ROOF LINE TRIM INSTALLATION

12.13 RIDGE CAP INSTALLATION WITH METAL PEAK BOX

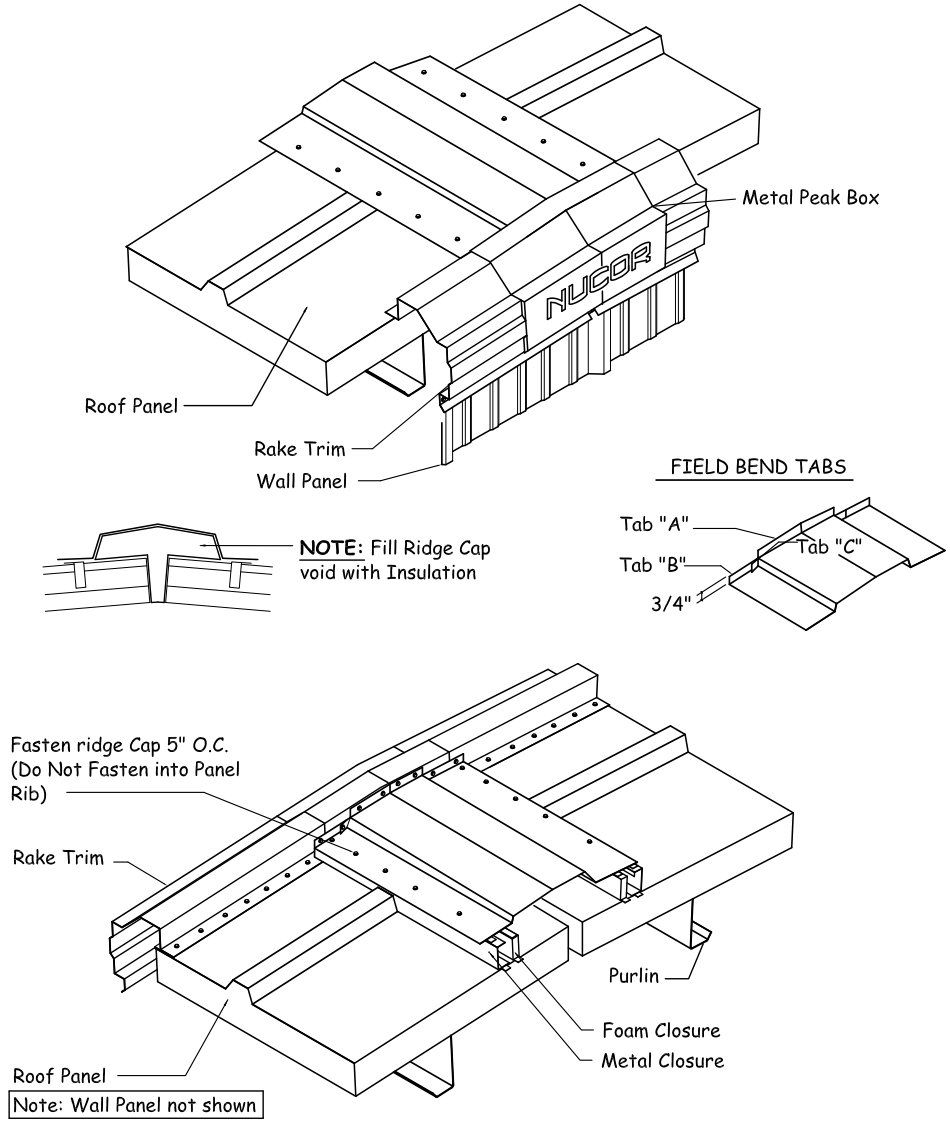
Install continuous **1/2" butyl tape mastic (H3010)** along the top of both Closures on both sides of the ridge. Remove the paper backing only as work progresses.

Field cut Tabs A, B & C as shown below. Apply **½" butyl tape mastic** (**H3010**) to all tabs and under each side of the ridge flanges. Caulk all edges to ensure weather tightness as required with **polyurethane tube caulk (H3152).** Fasten to metal peak box/rake trim with **H1050** fasteners.

Ridge cap must be properly positioned before touching the mastic**. Mastic cannot be reused**.

Center the ridge cap over the Closures and fasten with ridge cap colored self-drilling screws **(H1050)** per panel width 5" O.C. into Metal Closure. (**Do not** fasten into panel rib or foam closures).

Refer to the next page for ridge cap lap details.

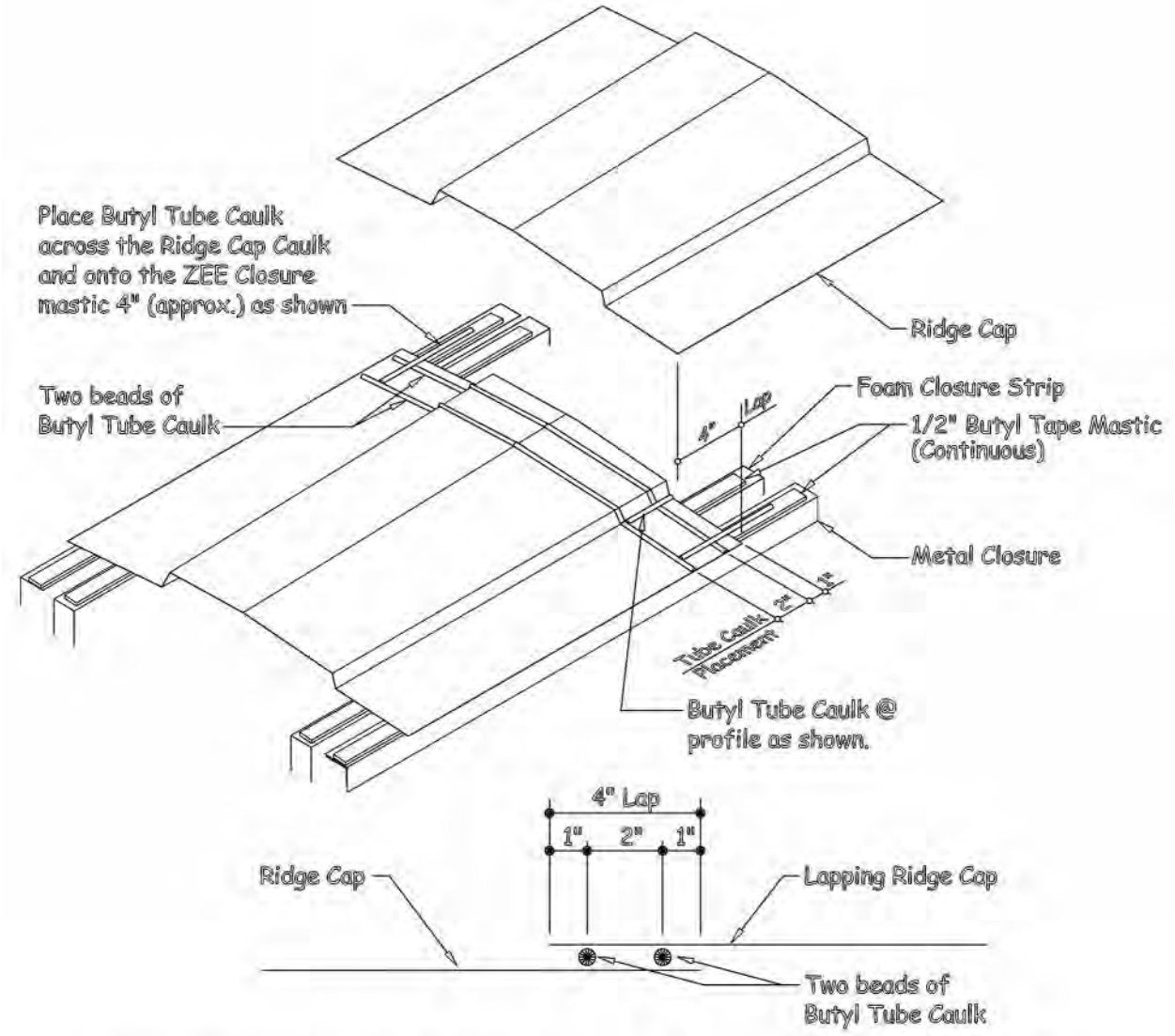


12.14 RIDGE CAP LAP DETAILS

IMPORTANT NOTE: DO NOT LAP THE RIDGE CAP AT A PANEL RIB.

Ridge cap is to be lapped 4", utilizing (2) beads of **BUTYL tube caulk (H3151)**. Also apply the tube caulk to the tape mastic as shown.

DO NOT USE FASTENERS AT RIDGE CAP LAPS. DOING SO WILL NOT ALLOW THE RIDGE CAP TO EXPAND AND CONTRACT AS DESIGNED.



RIDGE CAP LAP TUBE CAULK PLACEMENT DETAIL

12.15 PEAK TRANSITION INSTALLATION AT RAKE PARAPET TRIM

Field work the rake parapet trim as required at ridge. Apply **polyurethane tube caulk (H3152)** to all edges to ensure weather tightness as required**.**

Field cut Tabs A, B & C as shown below. Apply **½" butyl tape mastic** (**H3010**) to all tabs and under each side of the ridge flanges. Caulk all edges to ensure weather tightness as required with **polyurethane tube caulk (H3152).** Fasten to rake parapet trim with **H1050** fasteners.

Center the ridge cap over the Closures and fasten with ridge cap colored self-drilling screws **(H1050)** 5" O.C per panel width into Metal Closure. (**Do not** fasten into panel rib of the foam closures).

Place 1/2" butyl tape mastic (**H3010**) **inside of the** ridge parapet cap (RGC01) **and place over the transition piece to provide a flat surface for the wall panel attachment.**