



## SMI 2" MECHANICAL SEAM PLYWOOD INSTALLATION DETAILS

### PANEL INFO

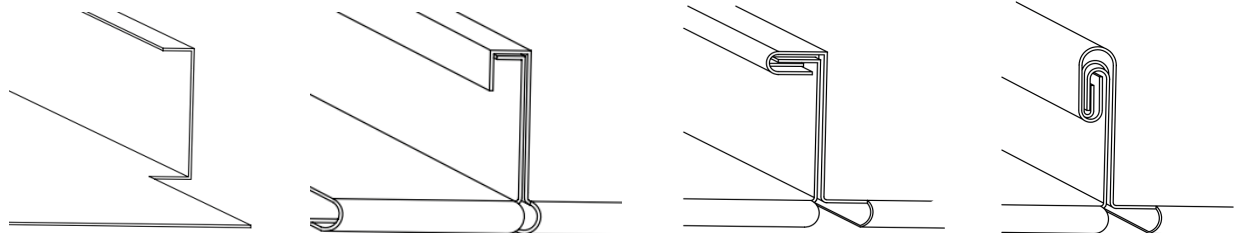
This panel is available in 22 / 24 GA steel or .040 aluminum with the following testing over plywood substrates:

- a. UL 90 – Uplift Rating
- b. UL-580 / 1897 – Uplift Test
- c. ASTM E 1680 - Air Infiltration
- d. ASTM E 1646 - Water Penetration
- e. ASTM E 2140 - Static Water Pressure Head (Steel Only)
- f. UL 2218 – Hail Resistance
- g. UL Class A Fire Rating
- h. Approved for Weathertight Warranty's

### PANEL PROFILE



### SEAMING PROCESS



Notch Panel

Hem Panel

90° Seam

180° Seam

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## **INTRODUCTION**

The application and detail drawings in this guide are strictly for illustration purposes only and may not be applicable to all building designs. It is the responsibility of the designer, roofing contractor and installer to ensure that the following details are adapted to meet the particular building requirements.

Sheffield Metals International shall be held harmless from any and all claims resulting from a lack of water tightness as a result of following these suggested typical detail drawings.

The installer shall be familiar with all erection instructions and examine the roof substrate to ensure it meets the minimum requirements and that the building is square before starting any work. Report any potential problems to the general contractor or architect. Do not start any work until all unsatisfactory conditions have been corrected.

When starting panel installation ensure panels are held true, plumb and straight. All panel widths are nominal and it is recommended that periodic measurements be taken to ensure panels are not gaining or losing width.

Sealant for joints and flashing conditions shall be non-drying, non-toxic, non-shrinking and shall have a serviceable temperature range of -50°F to 212°F. Sealant shall be field applied on clean, dry surfaces without any skips or voids in the bead. Sealant shall be supplied or approved by Sheffield Metals International.

Oil Canning can be described as the amount of waviness found in the flat area of metal panels. Oil canning is an inherent characteristic of light gauge cold formed metal products and is not a cause for rejection.

Tin snips or a “nibbler” type electric tool are recommended for field cutting panels, circular saws, torches and plasma cutters are not to be used. All metal filings must be removed to avoid rusting the metal surfaces which could void the paint warranty and shorten the life of the product.

When working dissimilar metals and PT wood a separation barrier must be used to prevent contact between dissimilar metals and PT wood. Only stainless steel fasteners should be used when fastening into PT wood.

It is the building’s owner or design professionals responsibility to consult with the controlling code agency officials or other governing authorities to determine the specific requirements of each project and system.

Sheffield Metals Technical Dept. should be contacted at 904-413-7425 when local, controlling codes or insurance requirements conflict with Sheffield Metals recommendations. When shop drawings are approved by Sheffield Metals Technical Department, they will take precedence over any and all other drawings.

## **SAFETY**

It is the installer's responsibility to study all applicable OSHA and other safety requirements before starting any projects.

Safety railing, netting, harnesses, and safety lines should be provided and used by all crew members working on the roof.

All personal protective equipment (i.e. gloves, safety glasses, long sleeves, long pants, hard hat) should be worn when installing or handling products.

## **MATERIAL STORAGE**

Unload material and inspect for damage. Notify your sales contact immediately for all damaged material.

It is recommended by the NCCA that pre-painted material be stored in an indoor facility isolated from the elements. If material must be stored outside proper precautions must be taken.

If the bundles are stored on the ground, a plastic cover must be put down under the bundle to minimize condensation of water from the ground onto the panels. The bundles must be then raised off the plastic ground cover to avoid contact with water puddles and allow for air circulation around the bundles to promote drying of condensed water. The panels must be stored at an angle to promote drainage of water off the bundle. Sufficient support must be provided to the raised and angled bundles to avoid excessive bowing, which may result in low spots that could hold water.

The bundle must be completely sheltered with a loose fitting waterproof tarp to protect the bundle during rain or snow events, but allow for air circulation and drying of condensed water.

In addition to water there are other important factors that contribute to the corrosion of stored, pre-painted panels. These factors are temperature and exposure time. Given enough time, panels will eventually become wet and storage corrosion may occur under most job site conditions. Even in a well-protected bundle the natural temperature and humidity variations will cause water to condense on and between the panels. Shipping the bundle from a cold area to a warm area will cause water to condense not only on the bundle but also between the panels.

In conclusion, storage corrosion can be prevented by:

1. Decreasing water contact.
2. Moderating temperature extremes.
3. Immediately drying moisture exposed bundles.
4. Reducing site storage time.

## **CLEANING AND MAINTENANCE GUIDE**

### **for Metal Building Components Coated With Sheffield Kynar 500 or Hylar 5000 Resin Paint**

Sheffield's Kynar 500 or Hylar 5000 resin paint systems are similar in molecular structure to Teflon®, a product most of us are familiar with through use in our households. The molecules on the surface of the coating are so tightly bound together that they don't want to react with anything. Their slick surface helps make them resistant to many elements found in the environment such as air pollution, acid rain and general airborne dirt.

Although Sheffield's factory applied finishes are extremely durable, a periodic cleaning to remove buildups of resins and other residue is a good idea to extend coating life. A variety of methods for removal of surface deposits are available. Simple washing with plain water using hoses or pressure spray equipment is usually adequate. When surfaces are dulled with heavy deposits of dirt or other contaminants, stronger methods may be needed.

Two precautions: (1) do not use wire brushes, abrasives or similar cleaning tools which will mechanically abrade the coatings surface and (2) certain cleaning agents listed below should be tested in an inconspicuous area before use on a large scale.

#### **GROUP A: HOT OR COLD DETERGENT SOLUTIONS**

A 5% solution in water of commonly used commercial and industrial detergents will not have any deleterious effect on a fluoropolymer surface. These solutions should be followed by an adequate rinse of water. Use a cloth or sponge for application.

#### **GROUP B: SOLVENTS**

Most organic solvents are flammable and/or toxic and must be handled accordingly. Keep away from open flames, sparks and electrical motors. Use adequate ventilation, protective clothing and goggles.

Solvents that may be used to remove non-water soluble deposits (tar, grease, oil, paint, graffiti, etc.) from fluoropolymer surfaces include:

## **Alcohols**

- Denatured alcohol (ethanol)
- Isopropyl (rubbing alcohol)
- Methanol (wood alcohol)

Note: methanol is toxic.

The above alcohols have no permanent effect on fluoropolymer surfaces.

## **GROUP C: PETROLEUM SOLVENTS AND TURPENTINE**

- VM&P naphtha
- Mineral Spirits
- Kerosene
- Turpentine (wood or gum sprits)

The above solvents have no permanent effect on fluoropolymer surfaces.

## **GROUP D: AROMATIC AND CHLORINATED**

- Xylol (Xylene)
- Toluol (Toluene)
- Perchlorethylene (Perclene)
- Trichlorethylene (Triclene)

Note: Perchlorethylene and Trichlorethylene are toxic

The above solvents should be used with caution on fluoropolymer surface and in contact with solvent to five minutes maximum and test before using.

## **GROUP E: KETONES, ESTERS, LACQUER THINNER AND PAINT REMOVER**

- Methyl isobutyl ketone (MIBK)
- Ethyl acetate (nail polish remover)
- Butyl acetate
- Lacquer thinner
- Paint remover (non-flammable)

The above solvents should be used cautiously on a fluoropolymer surface. Limit contact of fluoropolymer surface and test before using. Note: There are many formulations of paint remover on the market. It is possible that some will remove the fluoropolymer surface. Proceed very cautiously in use of paint remover. Metal supplier and coating manufacturer are not responsible for damage from unrestricted use.

## **GRAFFITI**

Graffiti presents a special problem because of the many possible agents used, generally aerosol paint. It is best to try the less active solvents first (Solvent Group A, B, C and D), then try stronger solvents (Solvent Group E). If none of these are satisfactory, it may be necessary to resort to touchup, repaint or replacement, depending on the extent of the damage.

## **CHEMICAL SOLUTIONS**

**Mildew:** In areas subject to high humidity levels- dirt and spore deposits can permit mildew growth to occur. The following solution is recommended to remove mildew when necessary:

- 1/3 cup dry powdered laundry detergent (such as Tide®)
- 1 quart sodium hypochlorite 5% solution (such as Clorox®)
- 3 quarts water

**Rust Stains:** Hydrochloric, citric acid or muriatic acid, diluter with ten volumes of water, may assist in removing rust stain from fluoropolymer surfaces. Limit contact to five minutes. Oxalic acid solutions or acetic acid (vinegar) may be used for the same purpose. Flush with water. *Caution:* acid solutions are corrosive and toxic. Flush all surfaces with copious amounts of water after use.

## **WARRANTY**

Misuse or abuse of any of the cleaning agents listed above will result in a voiding of warranty for the surface affected. For additional information contact Sheffield's Tech Department at 904-413-7425.

## **SPECIFICATIONS FOR REPAINTING COIL COATED METAL PANELS AND TRIM ACCESSORIES**

Work shall consist of surface preparation, cleaning and applying the specified amount of paint to all exterior coil coated surfaces.

### ***General Specifications***

All work shall be in accordance with the best painting trade and safety practices.

All safety devices, instruments, pumps, motors, lighting rods and non-paintable surfaces, such as masonry and glass shall be protected from sand, dirt, paint, overspray, and paint spatters. All protective materials, masking tape, etc., shall be removed promptly at completion of painting in the area concerned.

All loosened dirt, loosened paint, debris, paint cans, dirty solvent and waste materials shall be picked up and removed daily from building areas where such remains should be either unsightly or hazardous. When necessary, such debris shall be removed to prevent being blown or otherwise carried back into the cleaned and/or freshly painted surfaces.

### ***Surface Preparation and Cleaning***

All surfaces to be repainted shall be high pressure washed to remove all surface contaminants, and to remove any poorly adherent paint or clear coats. High pressure washing (also referred to as "water blasting" shall consist of detergent\* washing and a clean water rinse, both at water pressure of 2,000 to 5,000 psi. the pressure may be reduced on soft substrates (some soft aluminums), but the highest practical pressure shall be maintained.

- A suggested detergent mixture is: 3 quarts water, 1/3 cup Tide, 2/3 cup Trisodium phosphate, plus 1 quart of Clorox household bleach if mildew is present. Care must be taken to protect shrubs and adjacent areas of the building. Do not leave deposits on masonry surfaces. Wear protective gloves and goggles when using the cleaning solution.)

All cleaning work shall proceed sufficiently in advance of painting as to prevent contamination of painted surfaces. No paint shall be applied until surfaces have been rechecked and any further cleaning required has been completed.

### ***Paint Application***

Paints shall be applied only when the temperature of air and substrate is above 50 degrees F. Paints shall be applied by spray, said Contractor assumes full responsibility and liability for any and all damages incurred from paint overspray on automobile and equipment. Contractor shall notify building representative in charge when any spraying is to be performed and he shall note time and date on calendar for future reference in case of claims. Plant representative should be informed ahead of time so that he might make arrangements for different parking lot arrangements with the employees.

Procedures such as airless or HVLP (low pressure, high volume spray), are to be employed to conserve material and contain paint mist.





### ***Primer 'Coat***

Primer\* is required when the Fluropon coated surface has less than 3 years of weather exposure. Also, any area that exhibits rust or a bare metal surface must have primer applied before applying the Fluropon ADS topcoat material. Primer required is VP50 primer system, consisting of base, reducer & catalyst.

### ***Finish Coat***

All properly cleaned and or primed surfaces shall receive one (1) complete coat of Fluropon ADS. Apply 4.0 mils wet to achieve 1.0 mils dry film thickness. Two complete coats may be necessary dependent on color selection to achieve uniform color and gloss uniformity.

### ***Inspection***

Minimum dry film thickness shall be measured with a Nordson Microtest Gauge – or equal.

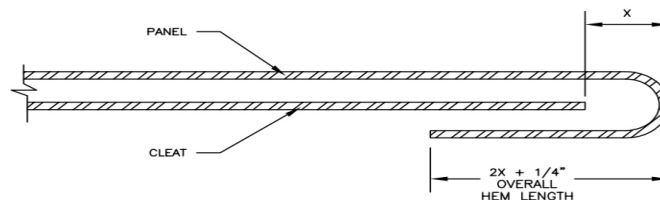
When inspection reveals improper cleaning or shortage of paint film, appropriate necessary repairs shall be made before proceeding with the work or before final acceptance of the work.

\*Primer may not be necessary when applying ADS over un-weathered clear coatings. Test area must be painted and cross hatch adhesion testing must be performed, prior repainting the entire project to insure proper adhesion is achieved to the clear coating.

## HEM LENGTHS

A standing seam roof panel experiences changes in panel length with changes in panel temperature. One end of the panel is fixed to the substrate while the other end is free to move. The panel end that is free to move requires a hem that engages a cleat that is fixed to the substrate. The hem and cleat permit the panel end to move along the plane of the roof while holding the panel flat.

The thermal movement also requires proper design of the hem and cleat. The length of the hem needed at the end of a panel will vary with the temperature range that the panel experiences and the length of the panel. Unless a more exact analysis of the temperature during installation compared to the anticipated temperature range is conducted, use the following equation and the Thermal Movement Table. When installing panels, be sure to leave room at the end of the panel that will experience movement for the "starting gap" which is the required air space (X) between the panel and cleat. Be sure that the hem is not tight against the cleat (unless the panels are being installed in the coldest temperatures the panel will experience). Also be sure that the lower edge of the hem will not contact any flashings when the panels contract.



THERMAL MOVEMENT TABLE

PANEL AND SUBSTRATE MATERIALS	PANEL LENGTH (FT.)			REQUIRED AIR SPACE (X)
	10'	50'	100'	
Steel on Rigid Insulation	1/8"	1/2"	7/8"	
Steel on Wood	1/16"	3/8"	5/8"	
Steel on Steel	1/16"	3/8"	5/8"	
Steel on Concrete	1/16"	3/8"	1/2"	
Aluminum on Rigid Insulation	3/16"	7/8"	1 9/16"	
Aluminum on Wood	3/16"	11/16"	1 3/8"	
Aluminum on Steel	1/8"	5/8"	1 3/16"	
Aluminum on Concrete	1/8"	5/8"	1 1/4"	

*This table assumes a temperature change of 100°F for the panel and 50°F for the substrate.*



PLYWOOD SUBSTRATE

#10 x 1" PANCAKE HEAD  
SCREWS @ 6" O.C.

PANEL

APPROVED  
UNDERLAYMENT

APPROVED SEALANT  
BETWEEN SEAMS

EAVE TRIM

FASCIA TRIM (IF REQ'D)

TRIM BOARDS,  
BY OTHERS

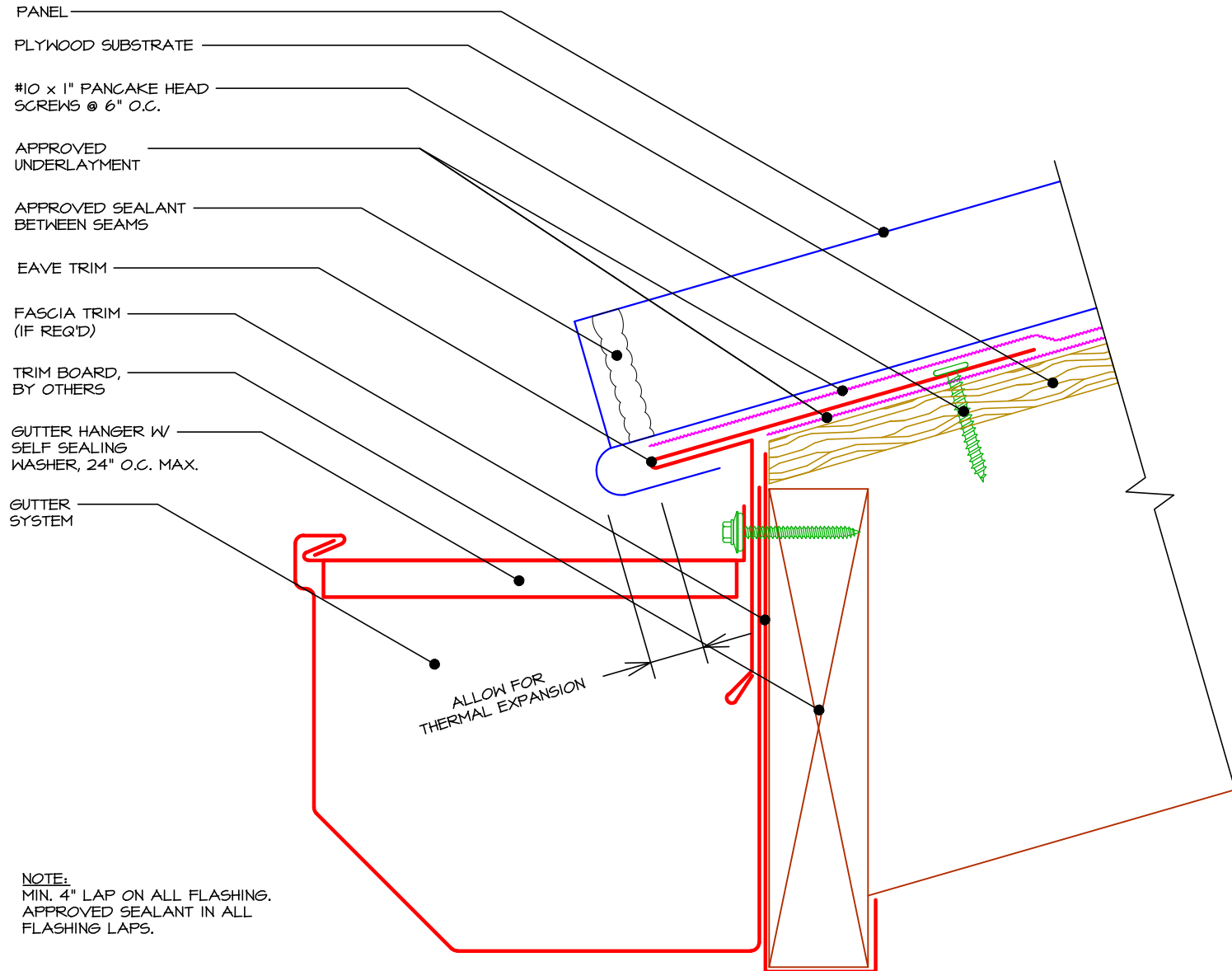
ALLOW FOR  
THERMAL EXPANSION

NOTE:  
MIN. 4" LAP ON ALL FLASHING.  
APPROVED SEALANT IN ALL  
FLASHING LAPS.

**E1 - Eave Detail**

NOT TO SCALE

1.800.283.5262

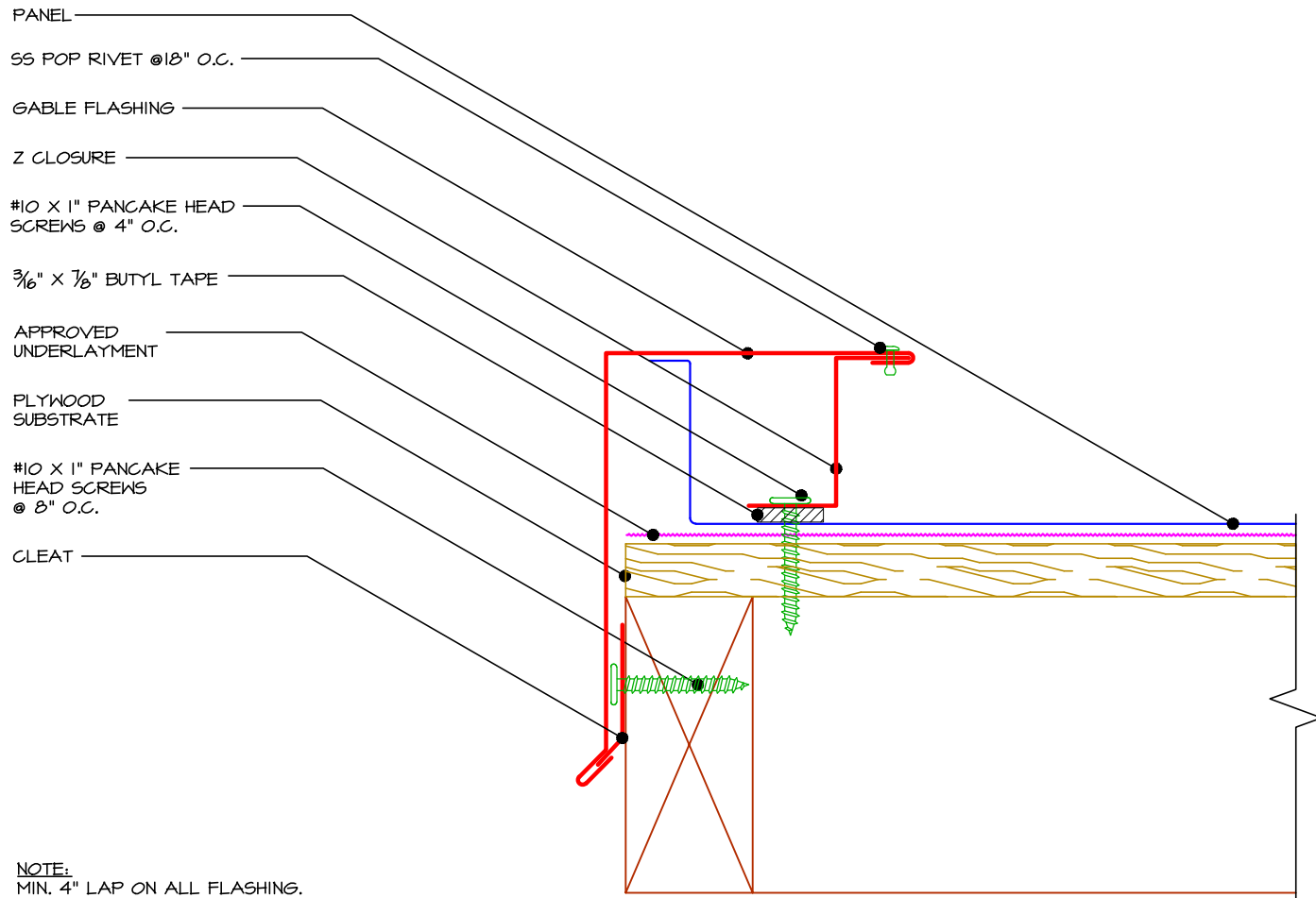


**NOTE:**  
MIN. 4" LAP ON ALL FLASHING.  
APPROVED SEALANT IN ALL  
FLASHING LAPS.

**EG1 - Eave W/ Gutter Detail**

NOT TO SCALE

1.800.283.5262

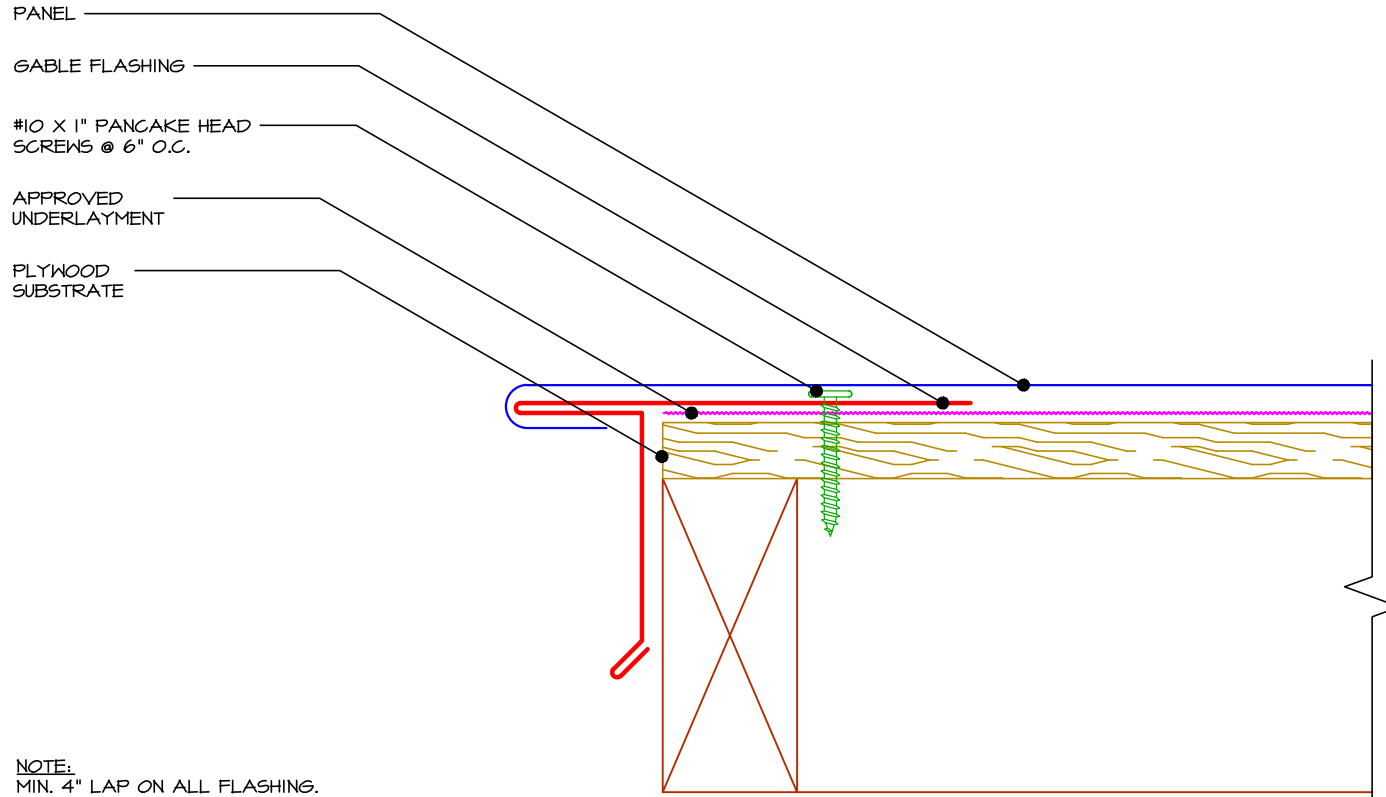


**NOTE:**  
MIN. 4" LAP ON ALL FLASHING.  
APPROVED SEALANT IN ALL  
FLASHING LAPS.

**RK1 - Rake / Gable Detail**

NOT TO SCALE

1.800.283.5262

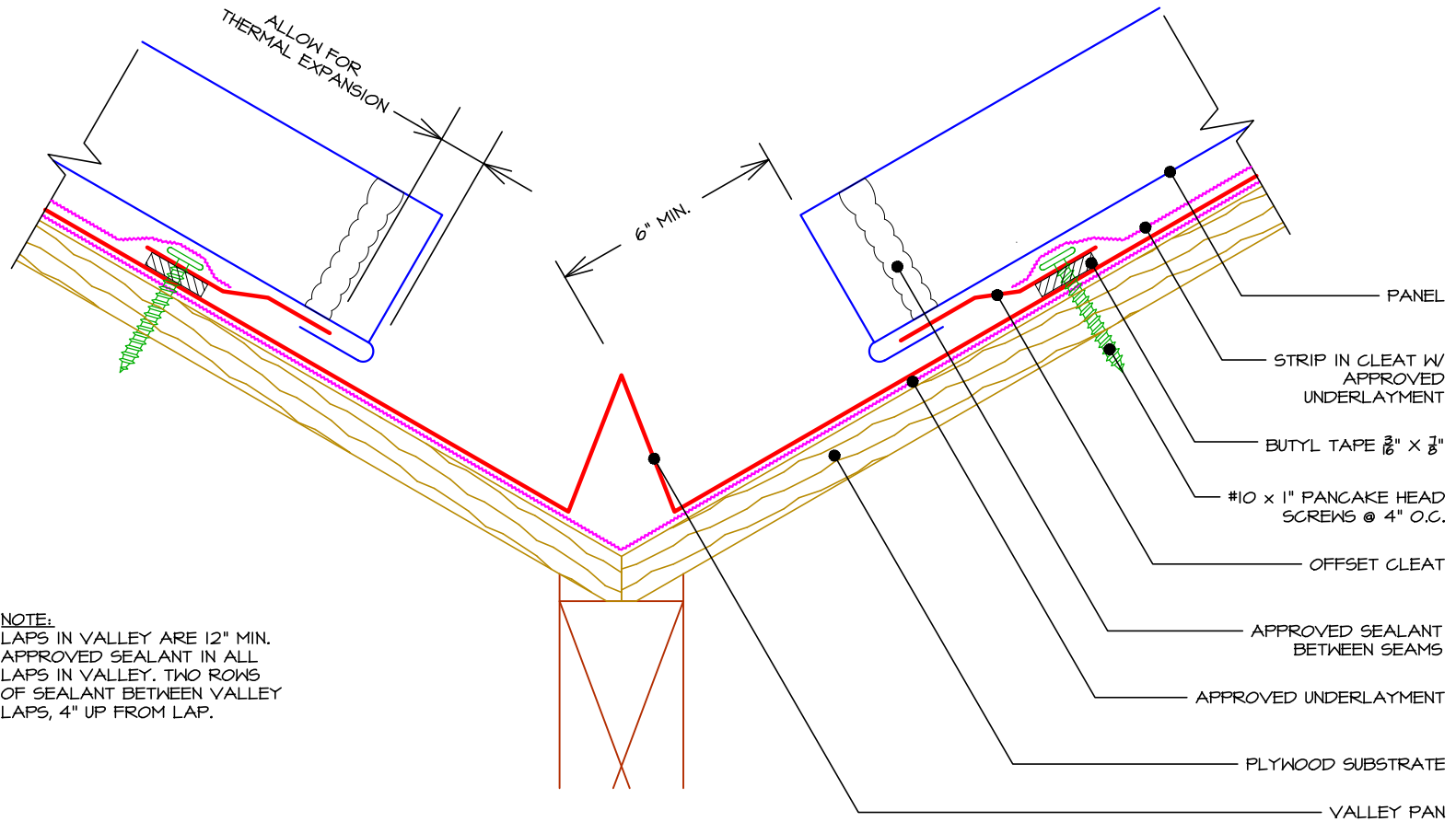


**NOTE:**  
MIN. 4" LAP ON ALL FLASHING.  
APPROVED SEALANT IN ALL  
FLASHING LAPS.

**RK2 - Rake / Gable Detail**

NOT TO SCALE

1.800.283.5262

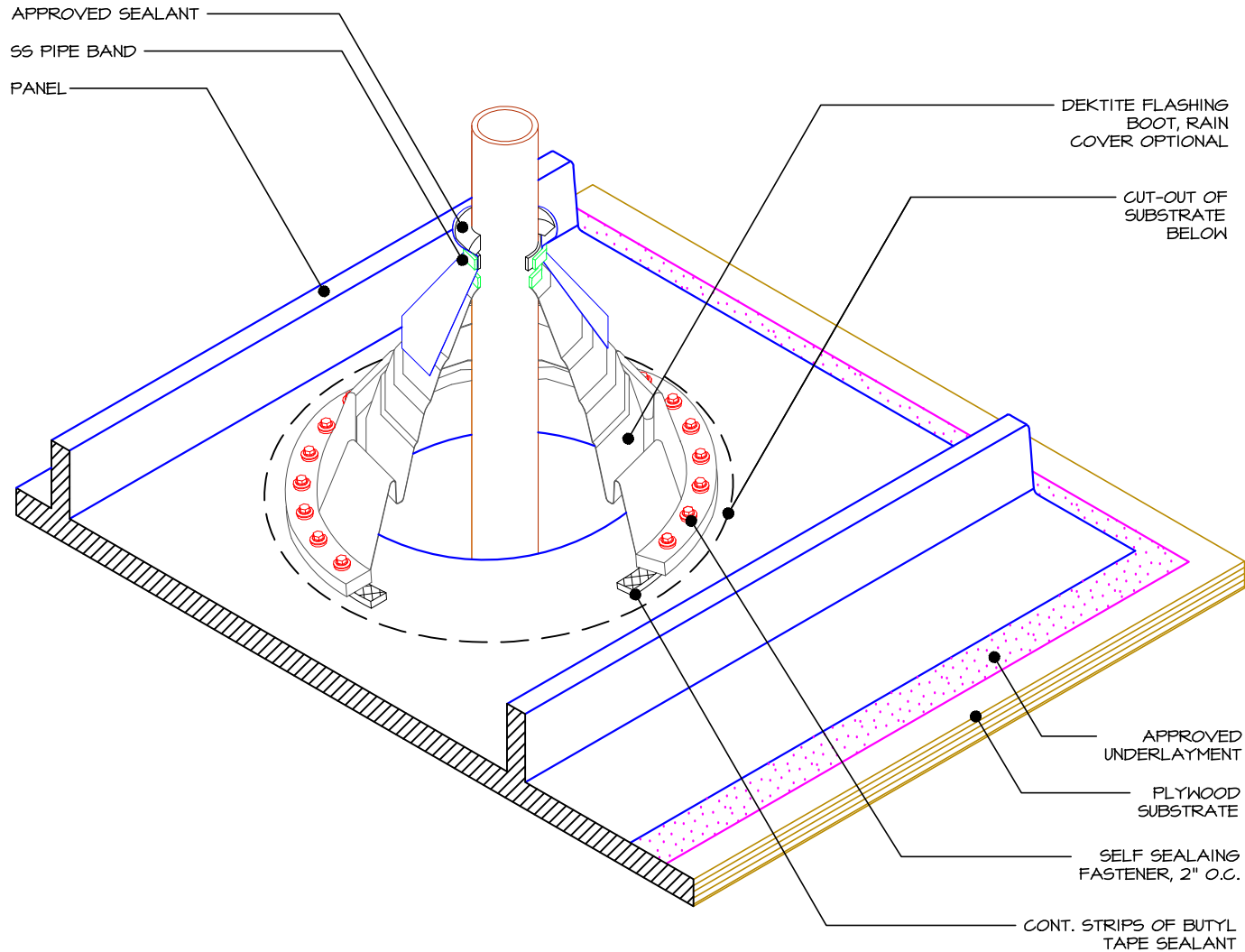


**NOTE:**  
LAPS IN VALLEY ARE 12" MIN.  
APPROVED SEALANT IN ALL  
LAPS IN VALLEY. TWO ROWS  
OF SEALANT BETWEEN VALLEY  
LAPS, 4" UP FROM LAP.

**V1 - Valley Detail**

NOT TO SCALE

1.800.283.5262

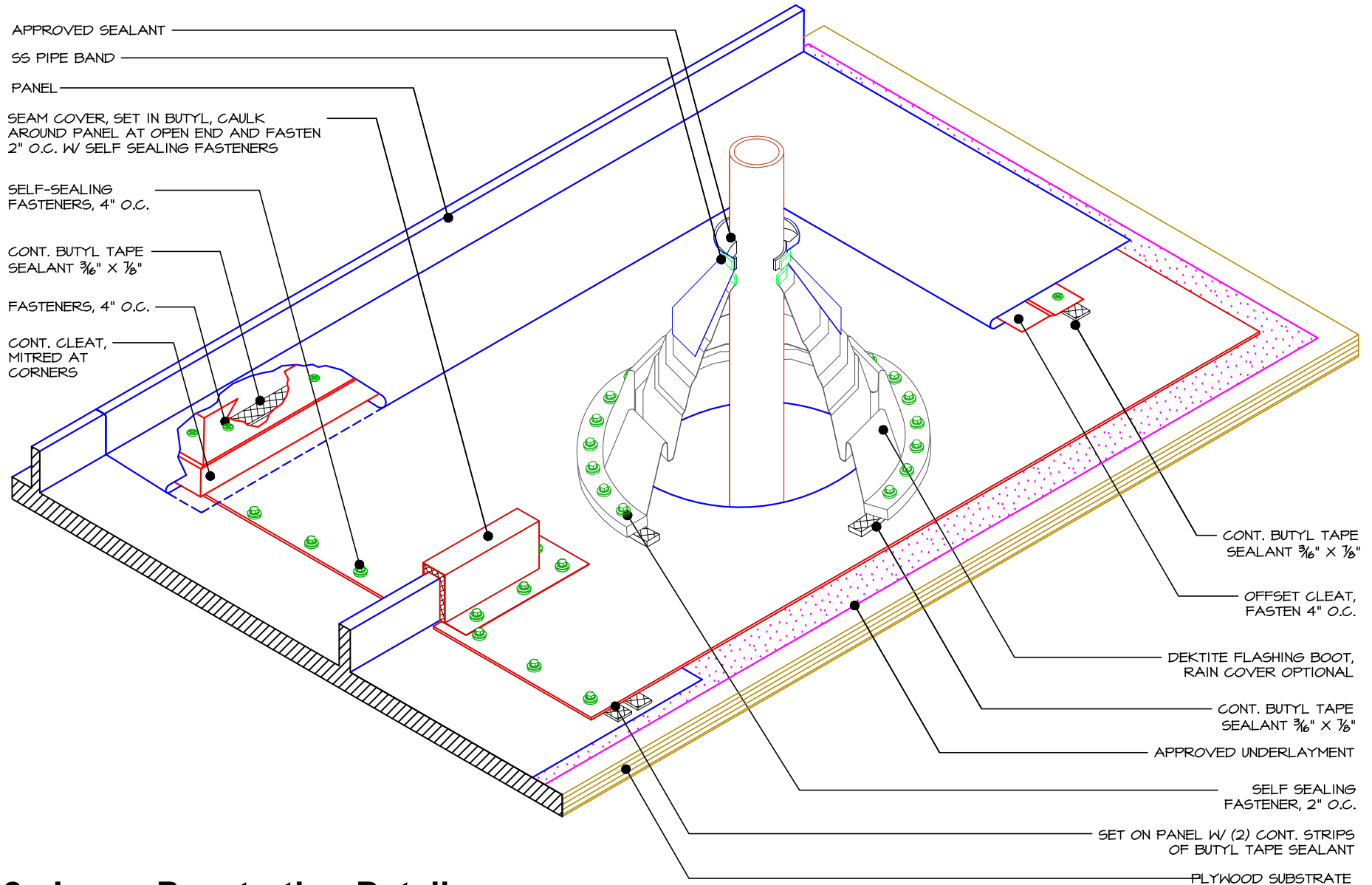


**P1 - Penetration Detail**

NOT TO SCALE

1.800.283.5262

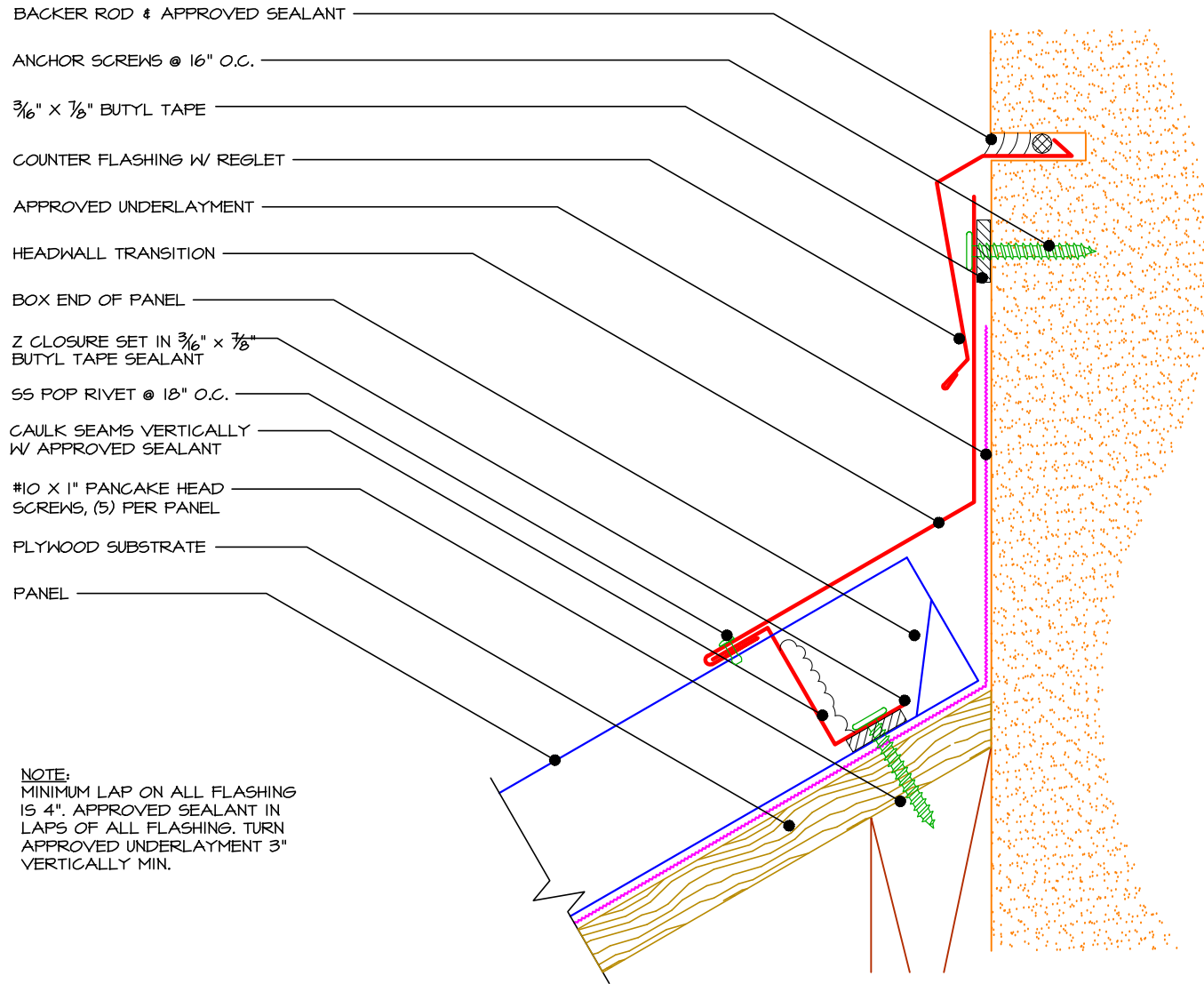




**P2 - Large Penetration Detail**

NOT TO SCALE

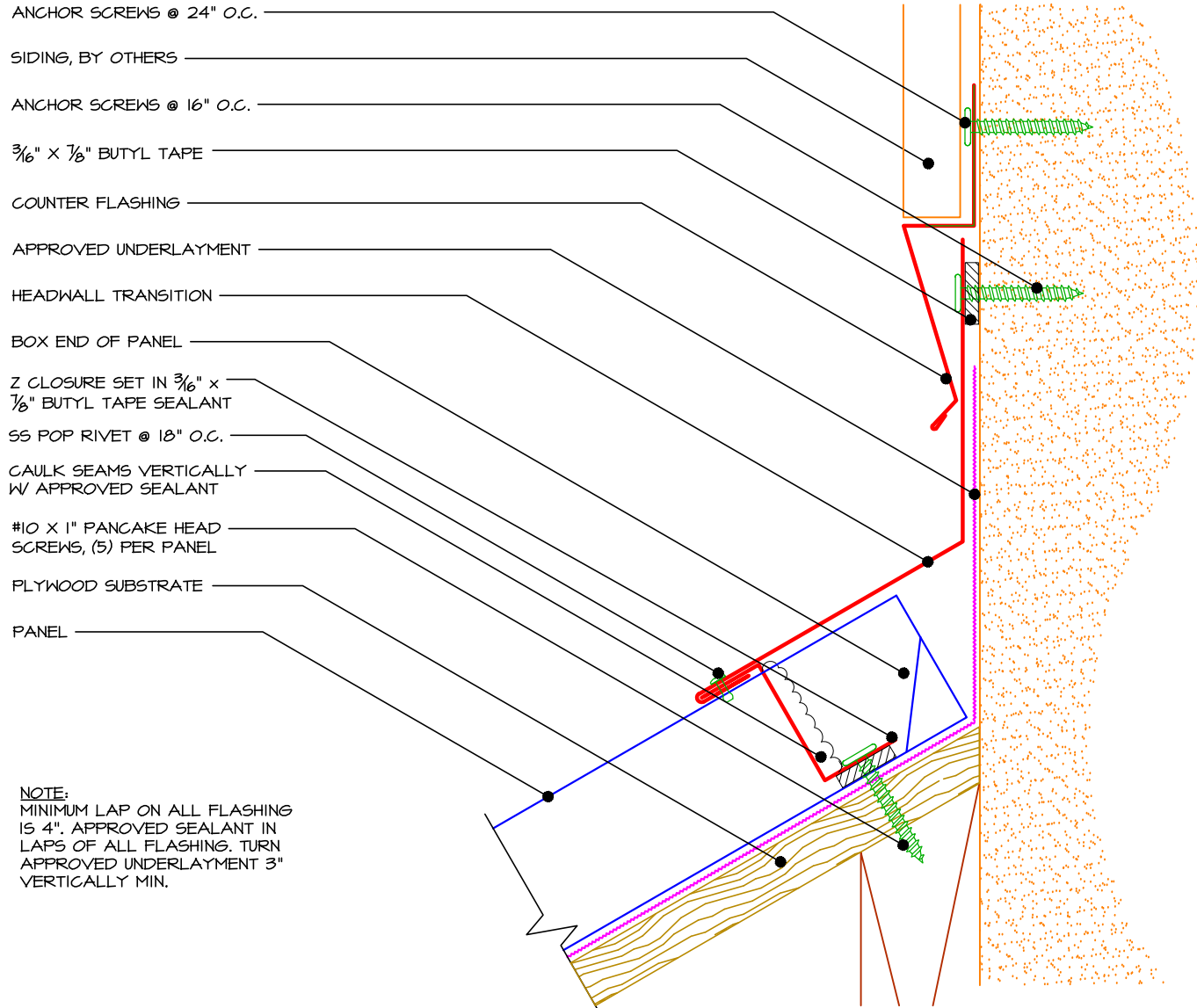
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**HW1 - Headwall Detail**

NOT TO SCALE

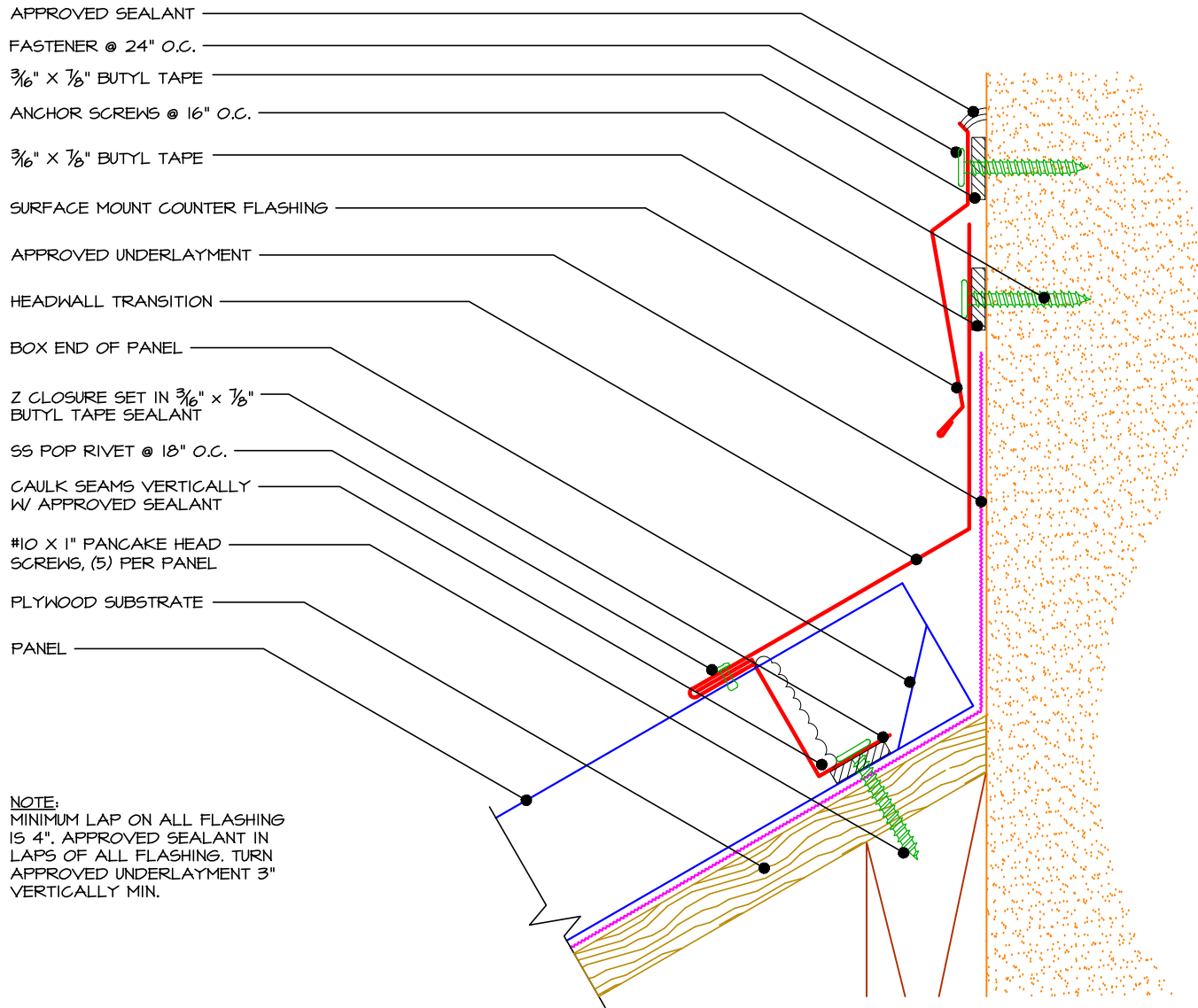
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**HW2 - Headwall Detail**

NOT TO SCALE

1.800.283.5262



**HW3 - Headwall Detail**

NOT TO SCALE

1.800.283.5262



BACKER ROD & APPROVED SEALANT

ANCHOR SCREWS @ 16" O.C.

$\frac{3}{16}$ " x  $\frac{7}{8}$ " BUTYL TAPE

COUNTER FLASHING W/ REGLET

SIDEWALL TRIM

FIELD BEND PANEL

SS POP RIVET, 18" O.C.

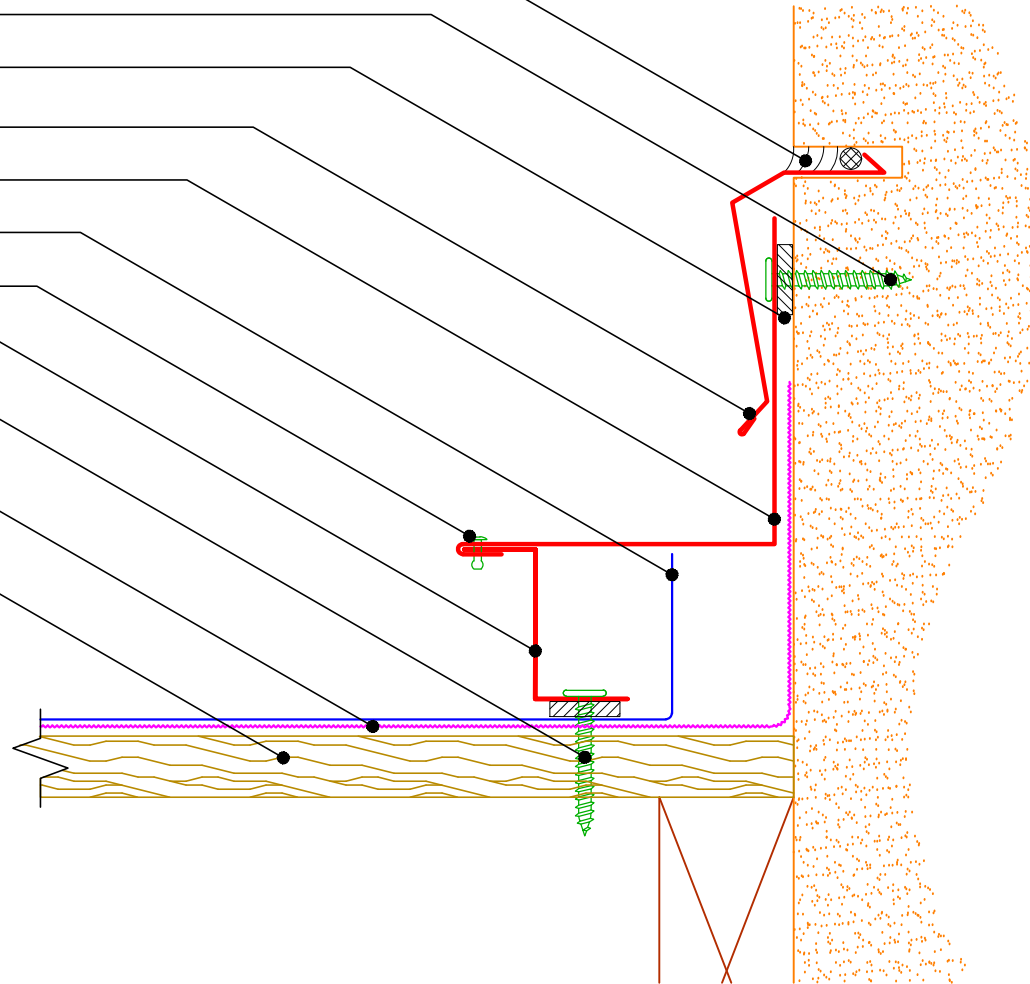
Z CLOSURE SET IN  $\frac{3}{16}$ " x  $\frac{7}{8}$ "  
BUTYL TAPE SEALANT

#10 x 1" PANCAKE HEAD  
SCREWS @ 4" O.C.

APPROVED  
UNDERLAYMENT

PLYWOOD  
SUBSTRATE

IE:  
MINIMUM LAP ON ALL FLASHING  
4". APPROVED SEALANT IN  
PS OF ALL FLASHING. TURN  
PROVED UNDERLAYMENT 3"  
RTICALLY MIN.



**SW1 - Sidewall Detail**

NOT TO SCALE

1.800.283.5262



ANCHOR SCREWS @ 24" O.C.

SIDING

ANCHOR SCREWS @ 16" O.C.

$\frac{3}{16}$ " x  $\frac{1}{8}$ " BUTYL TAPE

COUNTER FLASHING

SIDEWALL TRIM

FIELD BEND PANEL

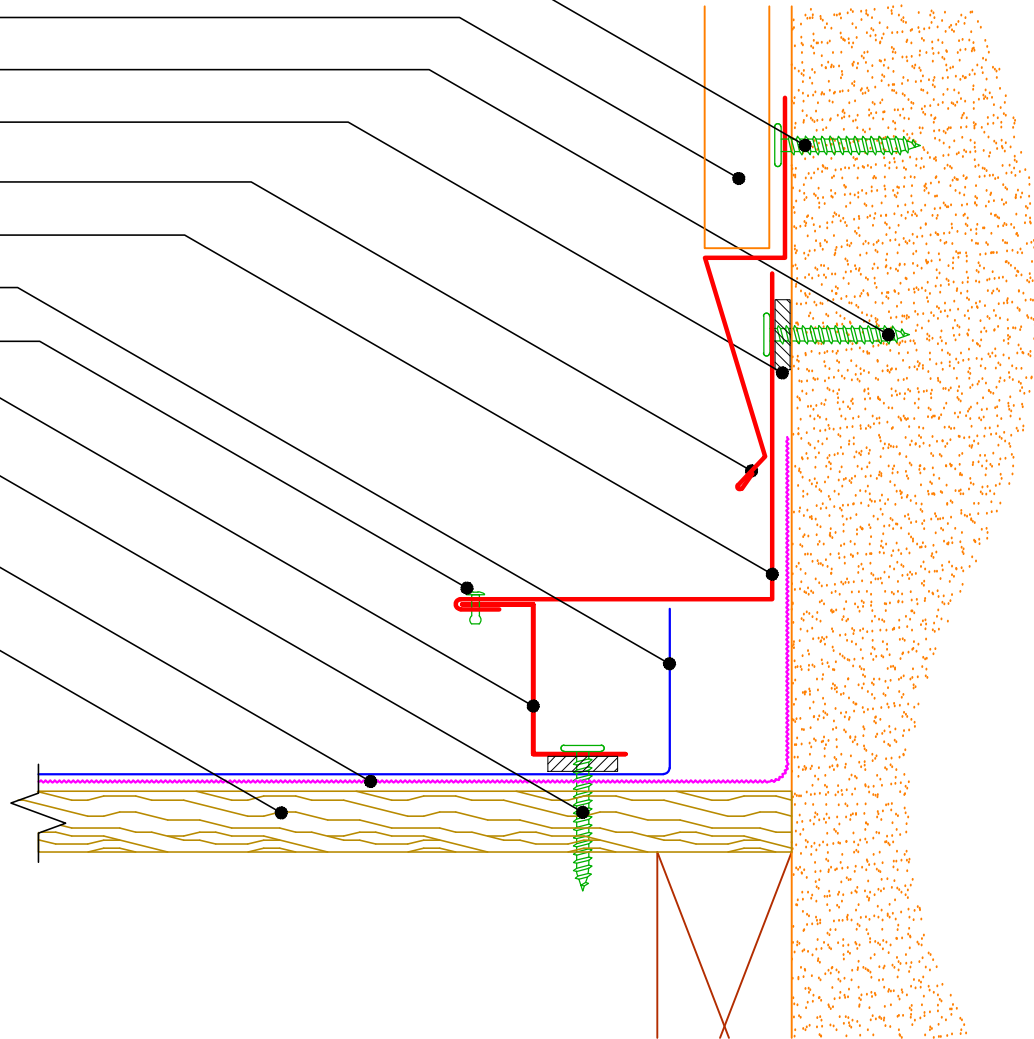
SS POP RIVET, 18" O.C.

Z CLOSURE SET IN  $\frac{3}{16}$ " x  $\frac{1}{8}$ " BUTYL TAPE SEALANT

#10 x 1" PANCAKE HEAD SCREWS @ 4" O.C.

APPROVED UNDERLAYMENT

PLYWOOD SUBSTRATE



**NOTE:**  
MINIMUM LAP ON ALL FLASHING IS 4". APPROVED SEALANT IN LAPS OF ALL FLASHING. TURN APPROVED UNDERLAYMENT 3" VERTICALLY MIN.

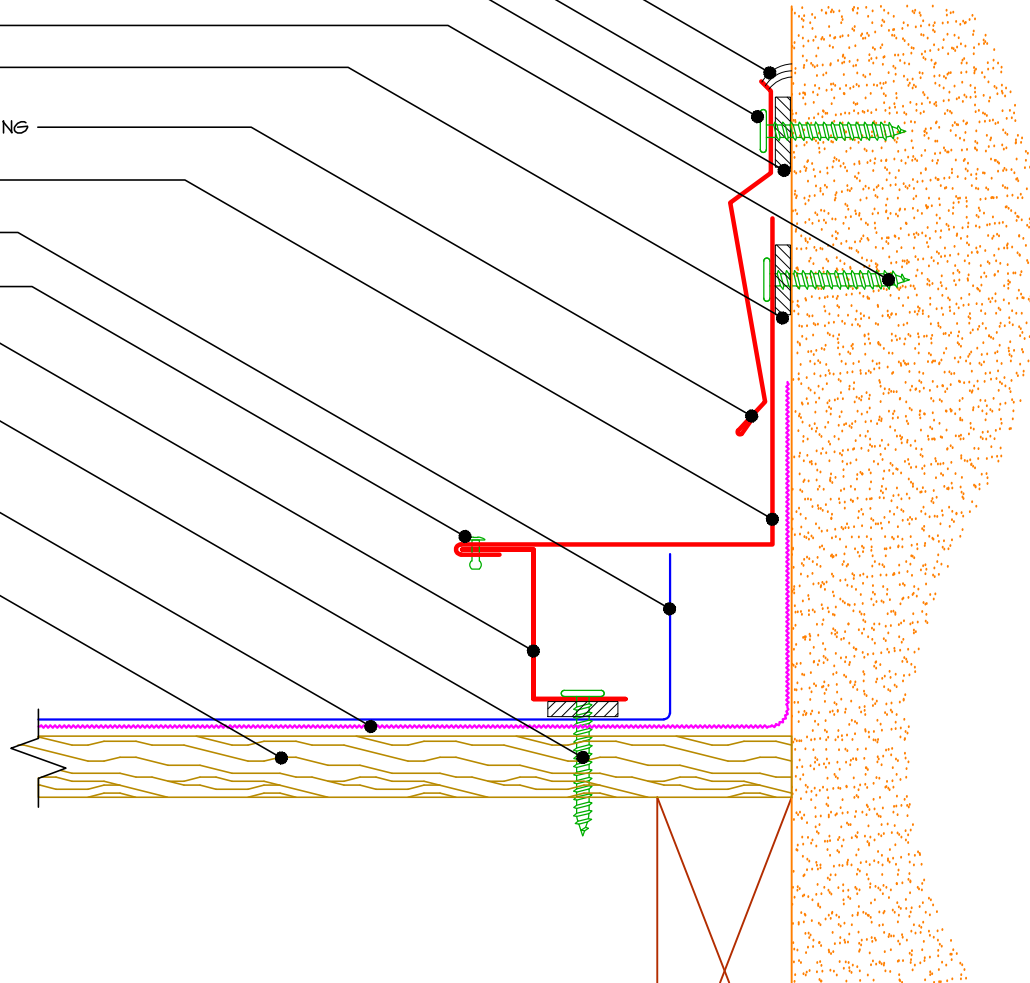
**SW2 - Sidewall Detail**

NOT TO SCALE

1.800.283.5262



- APPROVED SEALANT
- FASTENER @ 24" O.C.
- 3/16" x 7/8" BUTYL TAPE
- ANCHOR SCREWS @ 16" O.C.
- 3/16" x 7/8" BUTYL TAPE
- SURFACE MOUNT COUNTER FLASHING
- SIDEWALL TRIM
- FIELD BEND PANEL
- SS POP RIVET, 18" O.C.
- Z CLOSURE SET IN 3/16" x 7/8" BUTYL TAPE SEALANT
- #10 x 1" PANCAKE HEAD SCREWS @ 4" O.C.
- APPROVED UNDERLAYMENT
- PLYWOOD SUBSTRATE

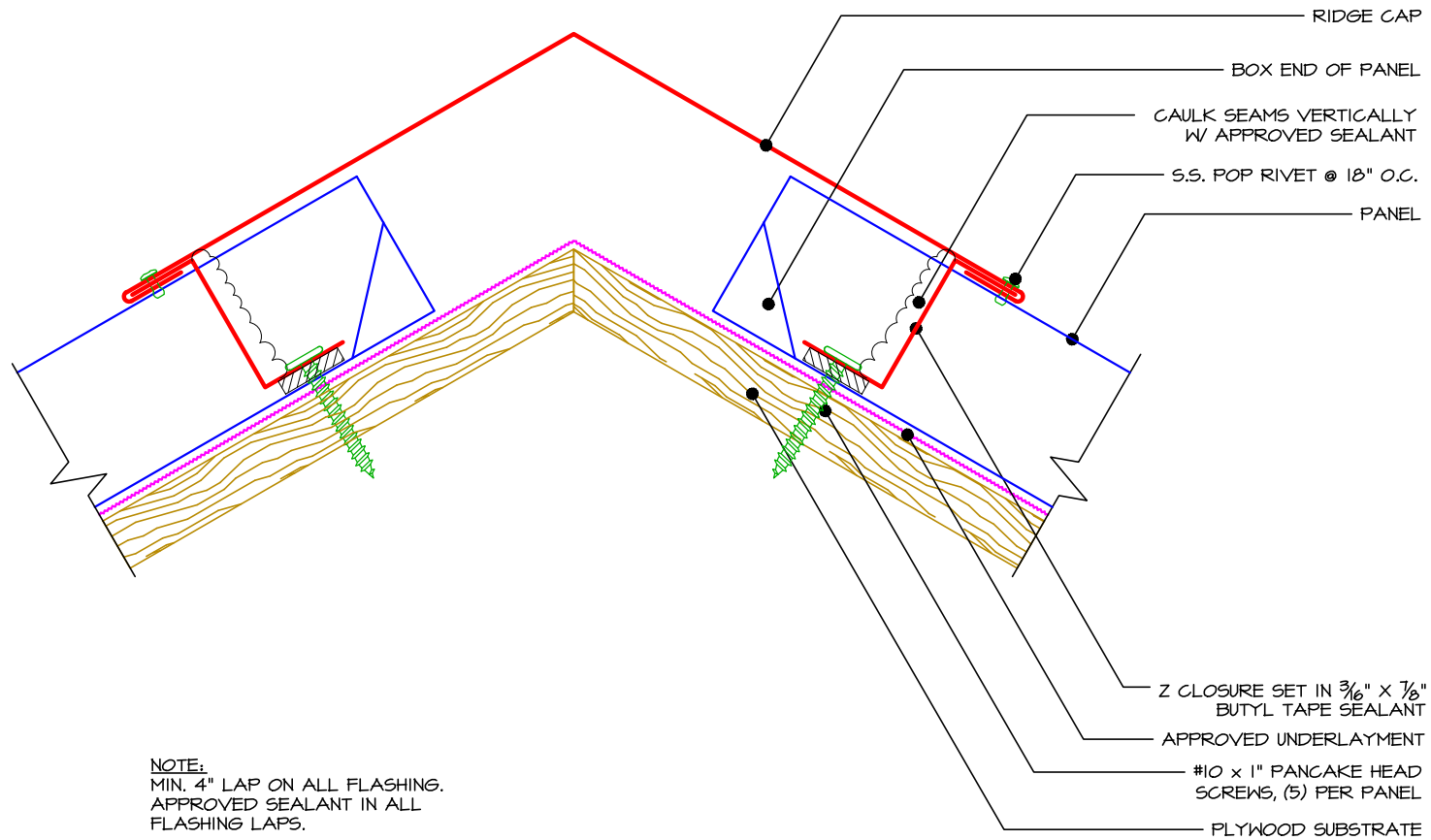


IE:  
MINIMUM LAP ON ALL FLASHING  
4". APPROVED SEALANT IN  
25% OF ALL FLASHING. TURN  
APPROVED UNDERLAYMENT 3"  
VERTICALLY MIN.

**SW3 - Sidewall Detail**

NOT TO SCALE

1.800.283.5262

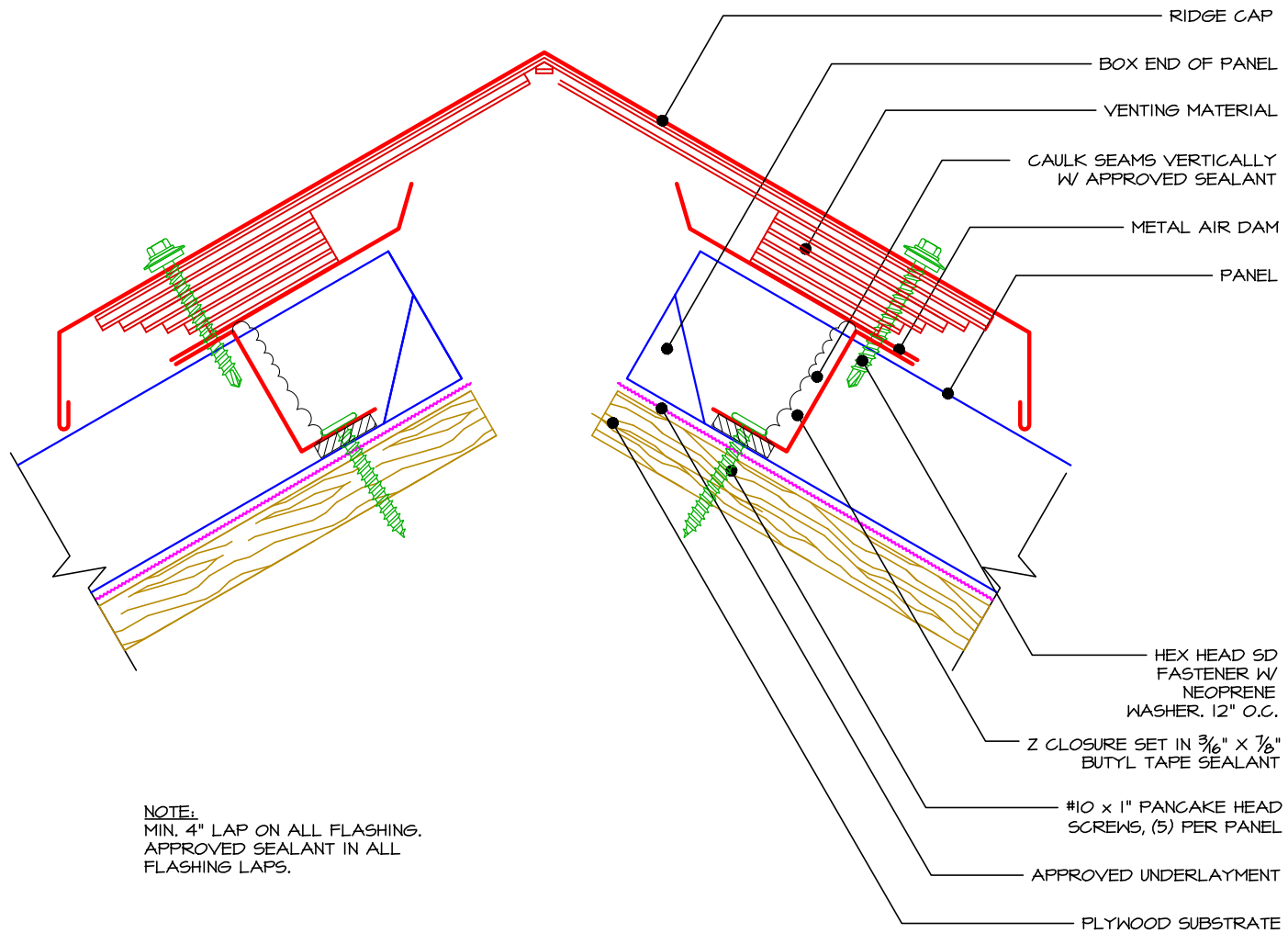


**HR1 - Standard Hip / Ridge Detail**

NOT TO SCALE

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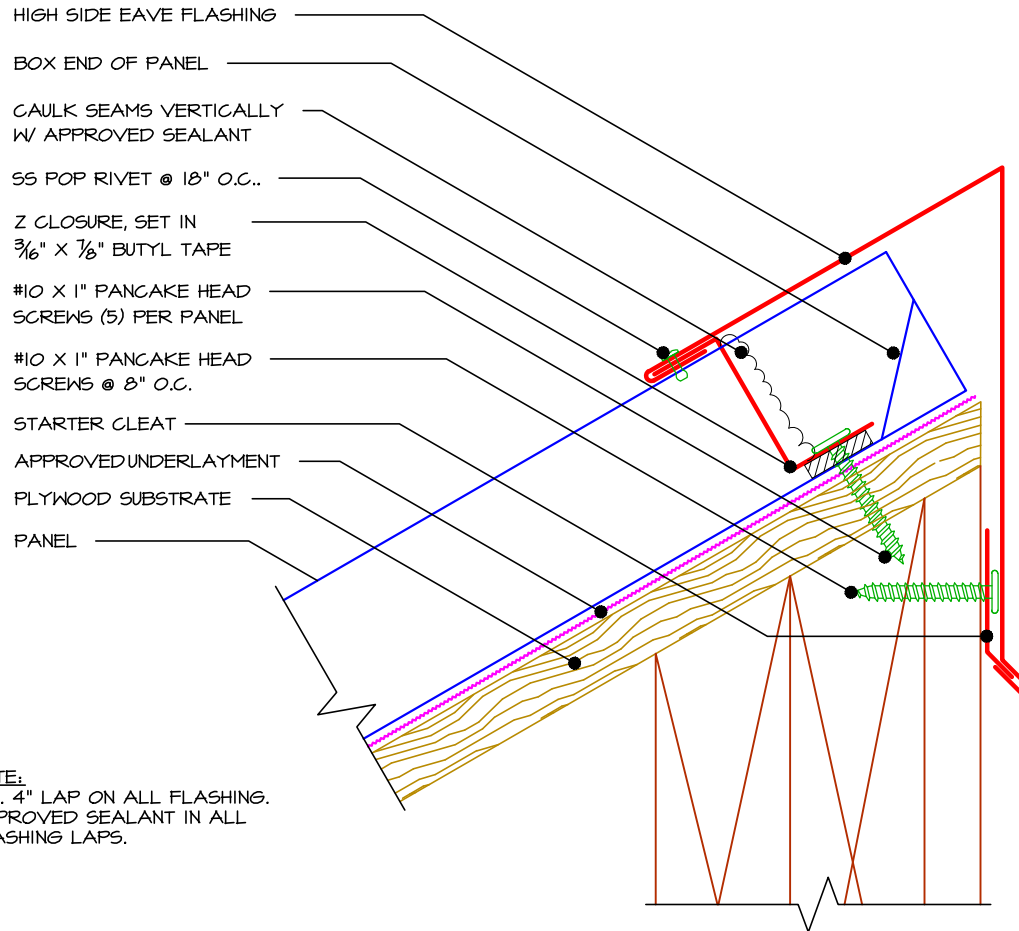


NOTE:  
MIN. 4" LAP ON ALL FLASHING.  
APPROVED SEALANT IN ALL  
FLASHING LAPS.

**VR1 - Vented Ridge Detail**

NOT TO SCALE

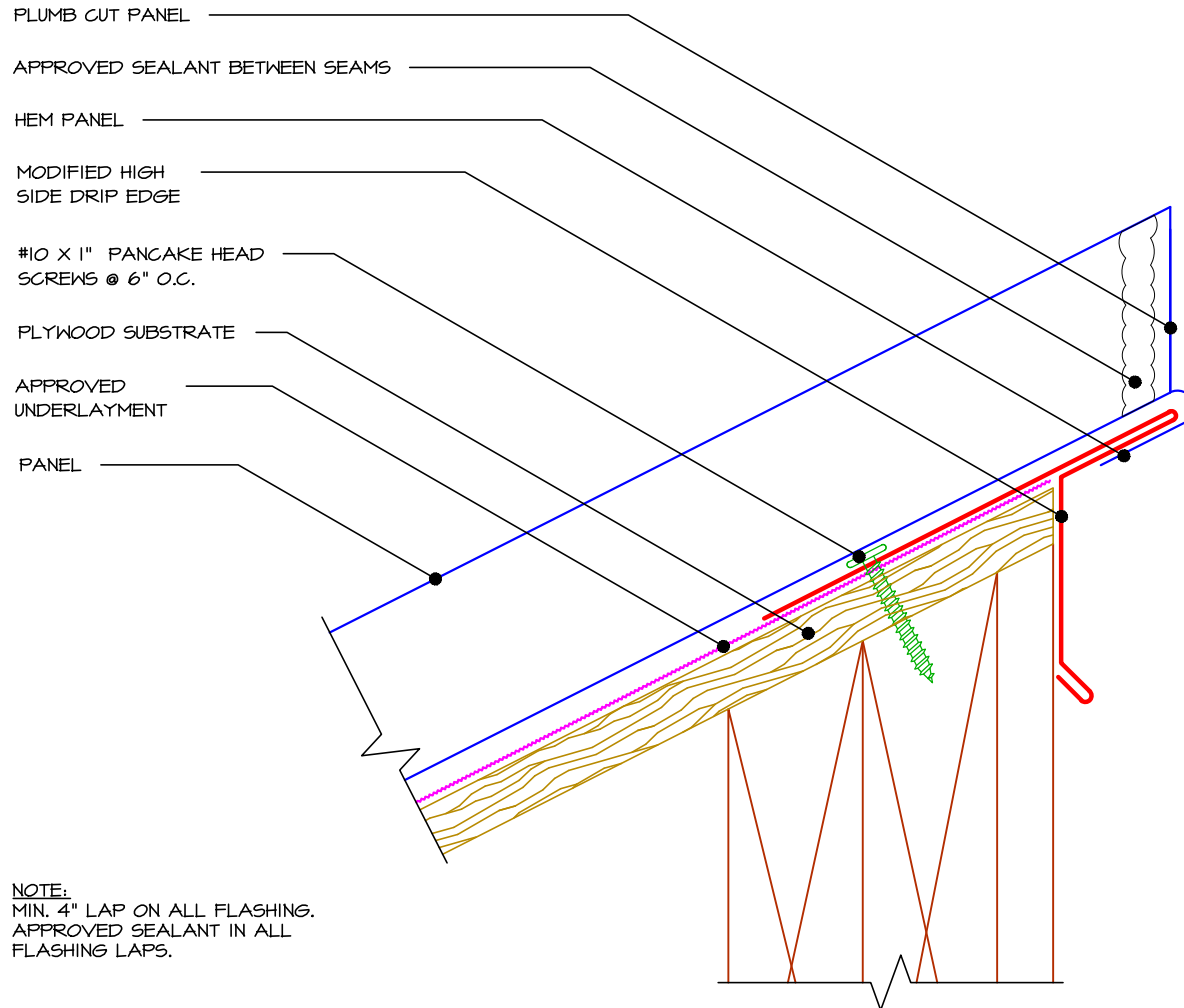
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**PK1 - High Side Eave Detail**

NOT TO SCALE

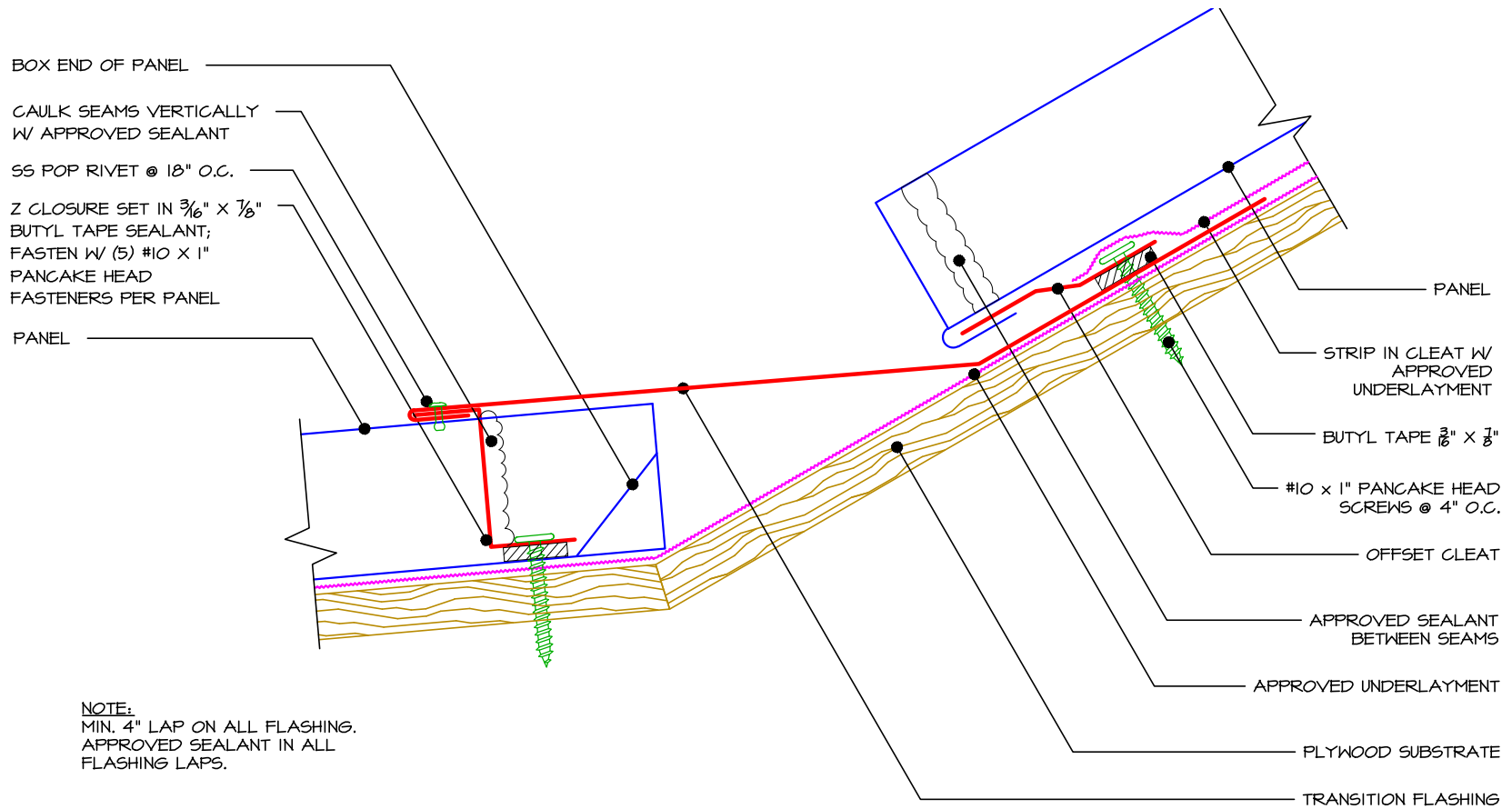
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**PK2 - High Side Eave Detail**

NOT TO SCALE

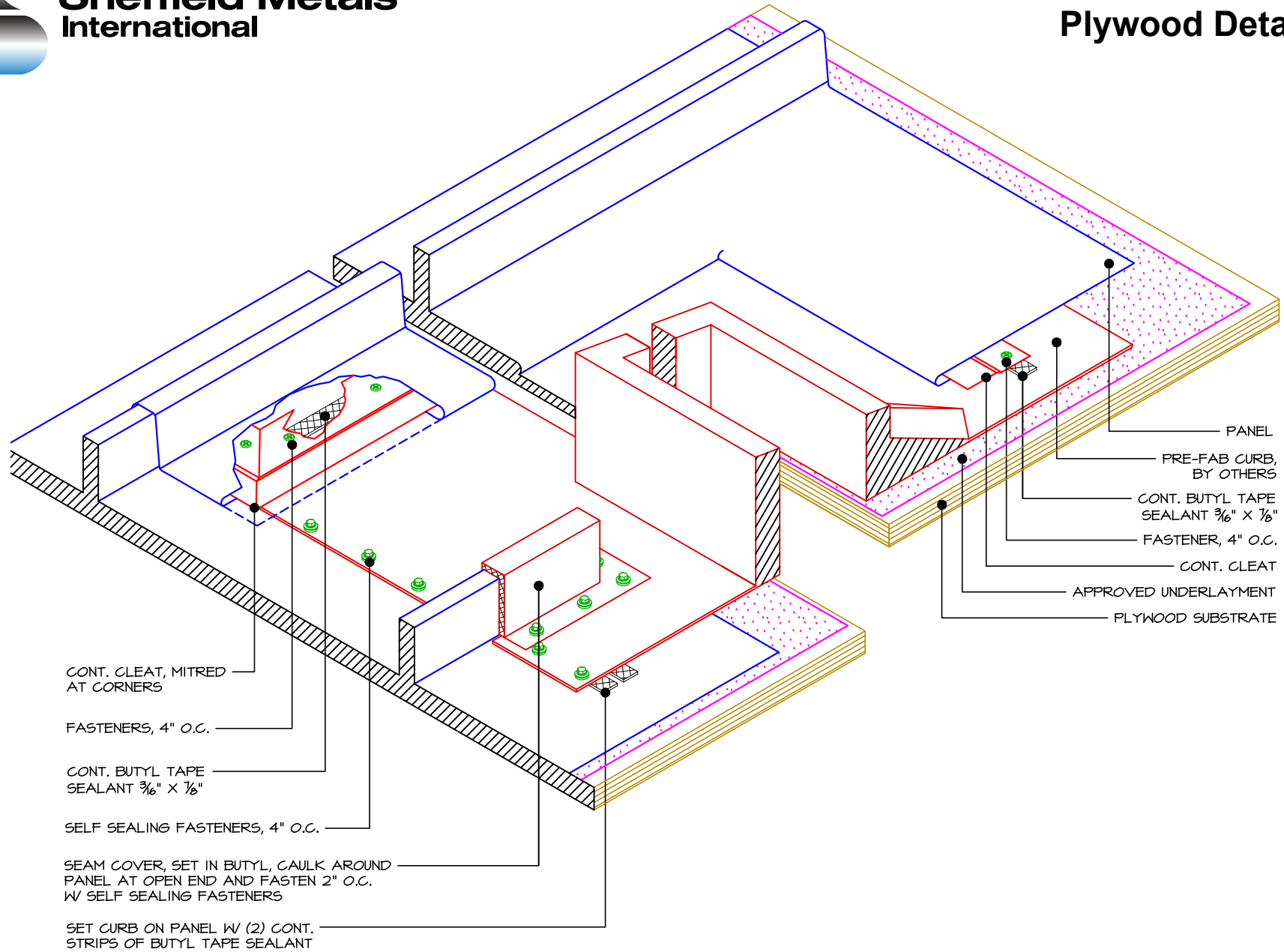
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**T2 - Roof Transition Detail**

NOT TO SCALE

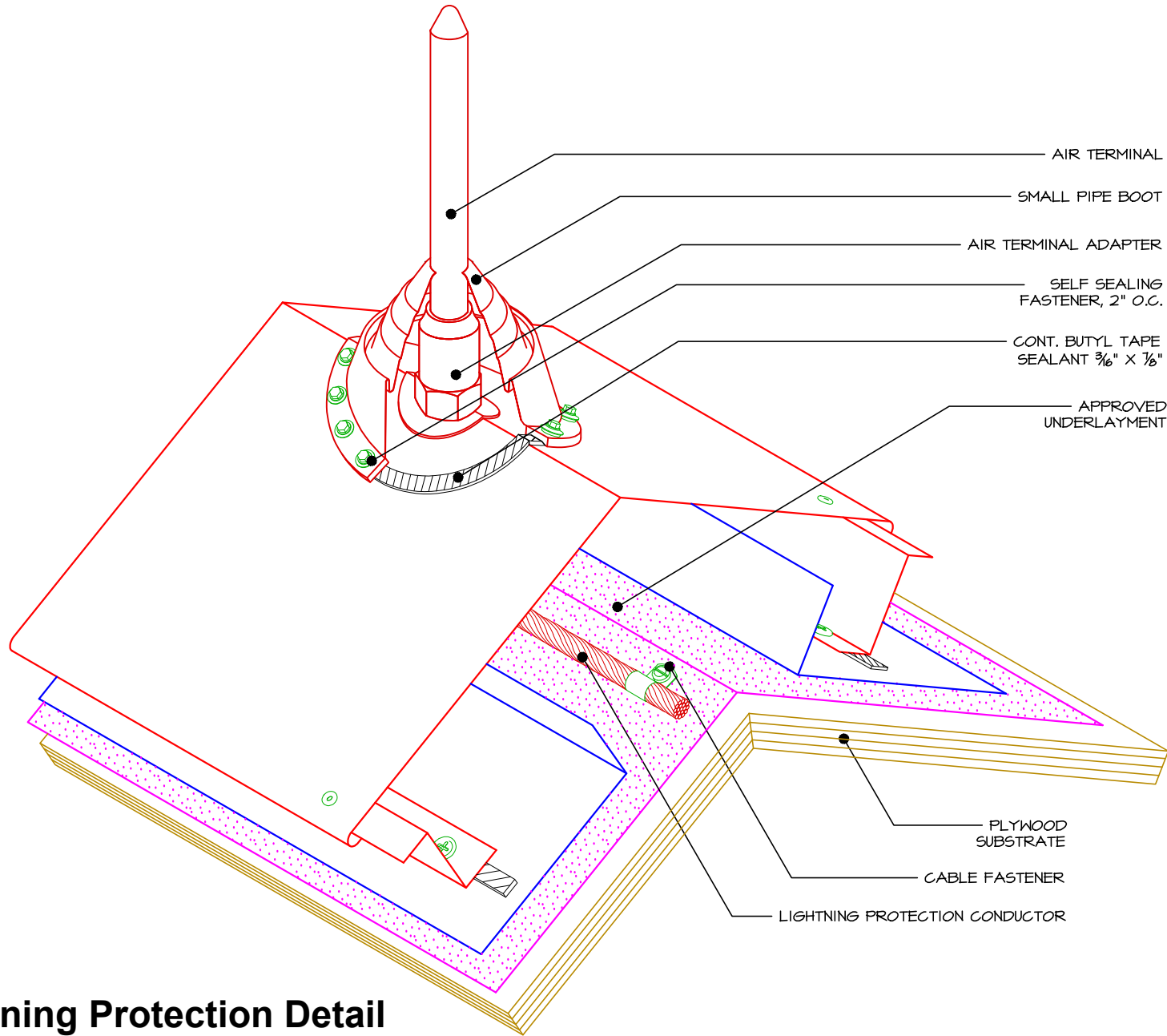
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**C1 - Curb Detail**

NOT TO SCALE

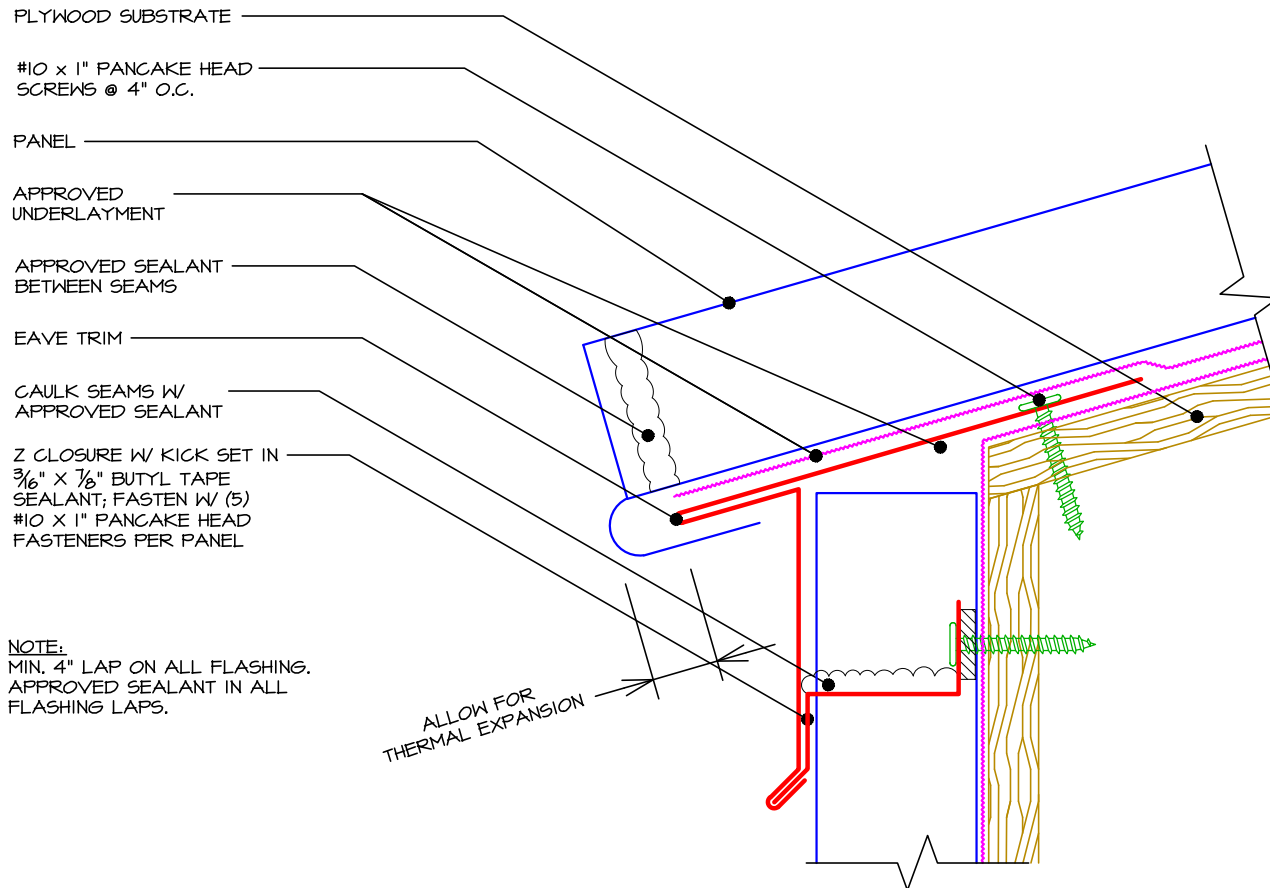
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**L1 - Lightning Protection Detail**

NOT TO SCALE

1.800.283.5262



**T1 - Roof / Fascia Transition Detail**

NOT TO SCALE

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