



KLAUER
METAL
PROCESSING

FF100 SNAPLOCK
INSTALLATION
MANUAL

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INTRODUCTION

It is important the roofing contractor read and understand all points in this manual.
Metal roofing should only be installed by experienced, trained professional roofers.

The application and detail drawings in this guide are proven methods but 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.

It is the buyer or installer/contractors responsibility to consult local building officials or architect/engineers to meet certain codes and load requirements.

Klauer Metal Processing should be held harmless from any and all claims resulting from a lack of water tightness as a result of improper installation.

It is the buyer or installer/contractors responsibility to determine lengths and quantity. Quantity of coil loaded on portable rollformer is based off contractor's estimate and should include excess for waste and mistakes. Field measurements are required prior to manufacturing panels with on-site rollformer for the most accurate installation. Any inaccurate lengths run will be purchased by contractor.

Also prior to installation it is buyers responsibility to inspect panels are held straight and plumb.

Sealant for flashings shall be non-drying, non-toxic and non-curing. Butyl tape and sealant are recommended. Sealant joints should be hidden from sun and weather exposure to extend life. Sealant should be field applied on clean, dry surfaces without any skips or voids in the bead.

Use of KMP's "snaptable" is recommended for all cuts to join with trims. Tin snips or a "nibbler" type electric tool can also be used for field cutting. Circular saws should **NOT** be used and will void paint warranty because of excessive heat and metal filings on surface.

When working with dissimilar metals and pressure treated(PT) wood, a separation barrier must be used to prevent contact. Only stainless steel fasteners should be used on PT wood. PT wood is treated with Copper. Copper and its effluence must not be in contact with steel or zinc products, including copper downspouts, plumbing or HVAC.

Avoid use with highly alkaline material and cleaners. Use non-toxic cleaner if needed. Avoid wet mortar, concrete, and stucco as these cementious materials are alkaline. Wait for them to dry prior to installation.

OWNER INFORMATION

In General, prepainted steel roofs are maintenance free and can offer years of trouble free coverage. There are still a few simple points that an owner should be knowledgeable of:

- First, **steel roofs are slippery and dangerous to walk on when wet.** Any dew, frost or pollen should be removed and allowed to dry before climbing on roof. Any major repairs should be done by a professional.
- Although most dirt will be washed off by rain, there may be exhaust or other greasy dirt that will require a powerwash. If needed a mild (phosphate free) detergent or small amount of bleach can be used.
- Any leaves or tree limbs should be removed from roof. These can scratch the roof as well as retain moisture, both of which reduce the effectiveness of steels coatings.
- Gutters and downspouts should be clear of leaves and debris to allow for proper drainage of roof.
- Any minor scratches should be painted with a touch up paint available from the manufacturer. Touch up paint will not weather the same as factory applied painted steel. This is only meant for small blemishes. Any larger scratches compromises the integrity of steel and individual panels should be replaced by contractor.
- Snow accumulation is common on steel roofs as snow creates a strong bond with steels painted surface. When roof is warmed up either by heat escaping from living space or from the sun, the bond weakens forcing all snow to be released at once which can cause damage and be quite dangerous. Insist that your contractor use a snow retention device to allow snow to melt slowly.

SAFETY

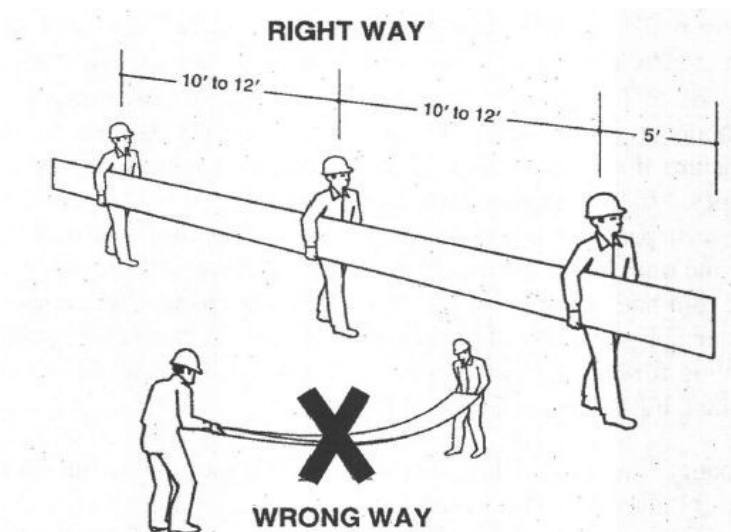
- Use gloves when handling metal panels. Edges are very sharp
- Follow all OSHA regulations when on roof. Fall protection with safety harnesses are required. Non penetrating Fall protection can be purchased for steel roofing.
- Do not attempt to walk or work on roof when wet or even the slightest frost, dew or heavy pollen. **Steel is very slippery when wet.** This information should be passed on to the homeowner after installation.
- Proper heavy soled footwear should be worn with thick treads. Make sure soles are clean of debris before walking on panels to avoid scratching.
- Care should be taken when handling panels and trim up on the roof from the ground. Hard hats should be worn on the ground.
- Strong winds are dangerous as they can knock an individual off balance. Especially dangerous is handling long panels in high winds. Work should cease until wind has subsided.

OIL CANNING

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.**

Most oil canning can be avoided and is primarily the installers'/contractors' responsibility:

- Roof Deck should be flat with no nails or protrusions. Seams of plywood or OSB deck should be flush
- Previous roofing material is highly recommended to be removed. This may cause oil canning and will not be a cause for rejection.
- Panels should use proper fasteners and should not be overdriven to cause distortions or inhibit thermal movement.
- Panels should be tested to “snap” together by hand without much force. This test should be performed prior to installation. If panels are hard to snap together this is a sign of larger problems and KMP should be contacted for adjustments.
- Panels should be carried on their side when transporting.



Klauer Metal Processing is not responsible for aesthetics of product after installation

THERMAL MOVEMENT

All materials experience changes in length due to changes in temperature.

And since roof temperature is much more extreme than ambient air temperature, allowing the panels to move thermally is key to avoiding oil canning or failure of roof.

The Formula for Thermal expansion is:

$$\Delta L = L \times \Delta T \times C^e$$

Length change(IN.) = length(of panel in IN.) X temperature change X coefficient of expansion

C^e for steel is *0.00000645in/in/deg F*

The difference of hottest and coldest **ROOF** temperatures can reach 250° in Northern Climates.

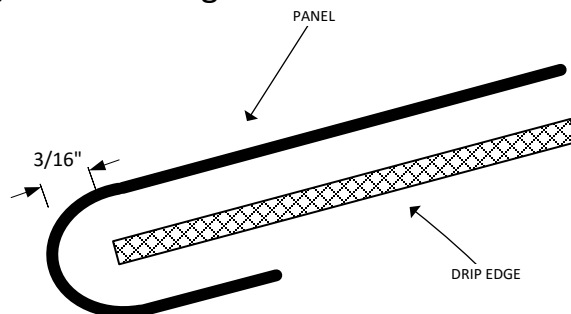
Example:

20ft. Panel(240in.) X 250° X .00000645 = .387 in. movement.

Klauer Metal Processing Snaplock panels do not use clips. They have a built in nailing flange with 1" prepunched holes for Thermal movement.

Thermal Movement guidelines:

- Panels are limited to 25' in length. If longer length needed a different profile is recommended.
- Panels should be fastened in the **MIDDLE** of the prepunched hole.
- Fasteners should **NOT** be overdriven to allow the free movement of panels
- Panels should not be fastened through the top to inhibit movement
- Panels should be hemmed at bottom over drip edge. Extra movement space should be given for the hem to allow for contraction. Hem should not be tight against drip edge unless being installed at coldest temperature.



CONDENSATION AND VENTILATION

Metal has a tendency to release heat quickly. As warm moist air rises it reaches the underside of the cool metal and condensates. However, once measures are taken to prevent humidity from reaching the dew point a properly installed metal roof will be condensation free.

The best prevention would be an insulated attic with a vapor barrier. The vapor barrier prevents interior moisture from reaching attic space. And the insulation keeps warm air from rising through to the roof. By keeping the warm air in and the cold air out condensation should not form below the roof.

Another key component to eliminate condensation and increase energy efficiency is proper ventilation. Ventilation refers to air movement between the metal panel and the roof deck or insulation across the roof. Venting is typically achieved through penetrations in the soffit and ridge. The basic idea is to prevent moisture build-up by keeping the air moving.

- Special consideration should be made to insulate, vent and vapor retard Vaulted or Cathedral style ceilings.
- As well extra ventilation may be needed for large meeting areas such as churches or gymnasiums. Or extra humid areas such as inside swimming pools or spas.

**An architect or design professional should be consulted under these circumstances.

INSTALLATION INSTRUCTIONS

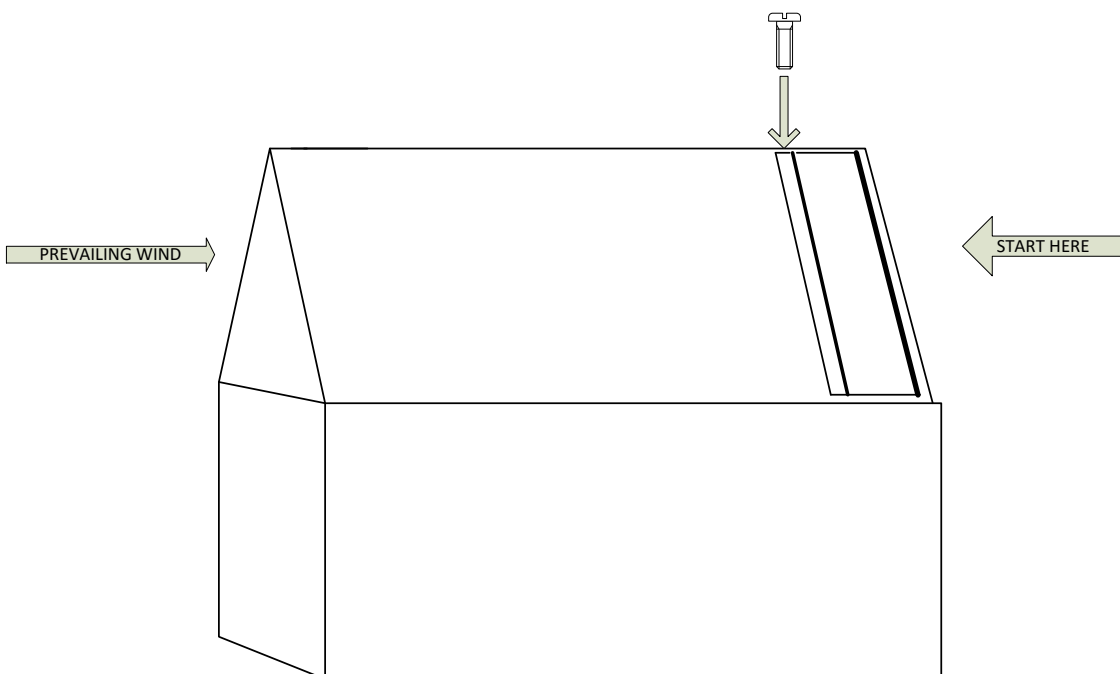
1. **Coverage:** The FF100 profile is typically sold in 16" width from rib to rib. The height of ribs is 7/8". Different widths are available upon request.
2. **Minimum roof pitch:** The FF100 profile rely on gravity and slope to shed water and therefore need a **minimum 3:12 pitch**. KMP offers different profiles for less than 3:12 pitch.
3. **Substructure:** To meet UL 90 test construction no. 529 requirements, nom 5/8" thick plywood is recommended.
4. **Moisture barrier:** 30# felt can be used with an ice and water shield at valleys, eaves and rake edge. A minimum of 36" of ice and water shield is recommended at these areas. Check with local code. **Synthetic underlayment or a Peel and Stick underlayment is recommended** as it is not asphalt product and wont stick to back side of panel when heated up. Also they don't require plastic caps for installation which may show through the finished side of panel. Moisture barrier is a stop gap measure for worst cases and should not be relied on to keep deck dry. Contractor should take all precautions to waterproof steel roofing.
5. **Fastening:** Fasten panels into place using #10x1in. Long No.2 Phillips, Pancake head screws. Fasten in straight and flush to nailing hem or risk heads showing through to finished side of panel. **Do Not overdrive** which can cause distortion or metal failure during wind loading. Fasten every 10in. O.C. The FF100 has nail holes every 5", so fasten every other hole. O.C. to allow for thermal expansion. In the case of high wind areas i.e., tall structure, high elevation, fasten every hole for perimeters of building (Ridge, Eave, rake)
6. **Weatherproof:** All panels should be caulked at the terminations with the trims. Driving rain and capillary action can cause water to flow up hill. Gravity should not be relied on to carry water. Trim installation details need to be followed.
7. **Foot Traffic:** Unnecessary foot traffic should be avoided. Wet panels are slippery and dangerous. Stay off major ribs to avoid damage. Underside of shoes should be clean to avoid scratching paint finish. KMP's trims allow installer to install trims before panels to reduce amount of foot traffic.

INSTALLATION INSTRUCTIONS

1. KMP FF100 snaplock panels are easily installed by overlapping the lap rib(female rib) over the purlin rib (male rib). Panels should snap into place with no more than a push from palm of your hand.
2. When installing over solid substrate, panel distortion may occur if not applied over properly aligned and uniform substructure. For aesthetics, the installer should check the roof deck for squareness before installing.

The 3-4-5 triangle Method – Measure a point from the corner along the edge of the roof at a module of (3). Measure a point from the same corner along another edge at a module of (4). Then by measuring diagonally between the two points established, the dimension should be exactly a module of (5) to have a square corner. Multiple uses of this method may be required to determine building squareness. Panels can be ripped at an angle at rake edge to make up for out of square.

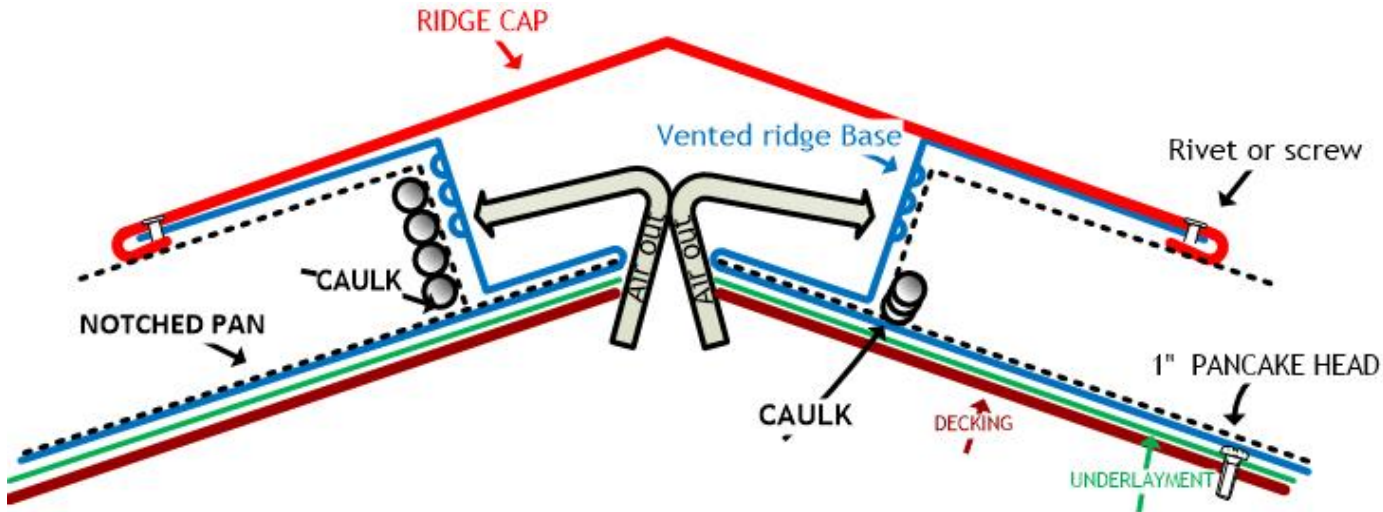
3. Install trim prior to installing panels. Overlap with ice and water shield or 1” sealant tape.
4. Measure from ridge base to bottom of drip edge. Be sure to add inch for the top to tuck under ridge base. Add inch for the bottom hem over the drip edge plus 3/16” for contraction room between hem and drip edge.
5. Find out where prevailing wind is in orientation to your roof. Start at opposite side of prevailing wind. Male (fastener side) should face prevailing wind.



INSTALLATION INSTRUCTIONS

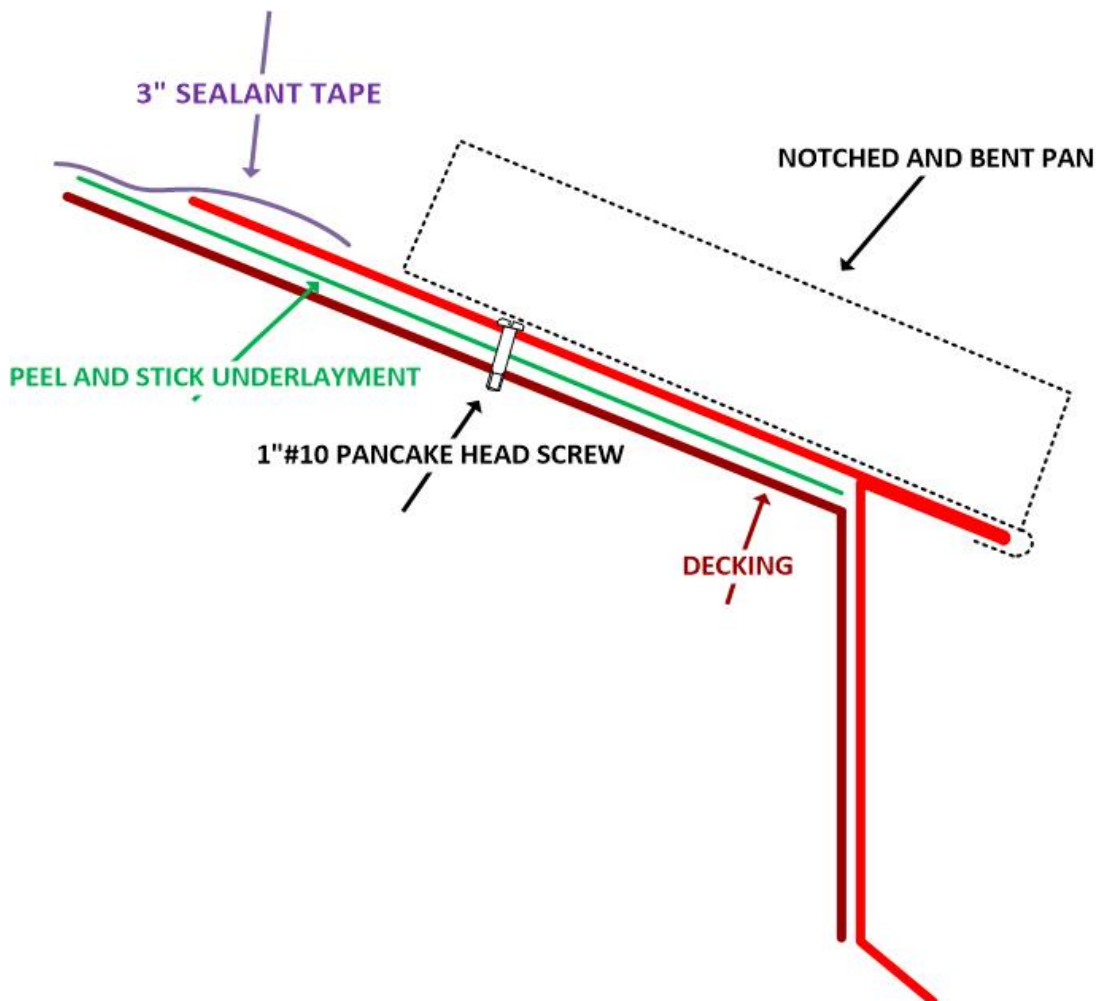
6. Prior to installing determine the layout of your roof. For aesthetics the ribs at hips and valleys should line up on opposing sides. Also, for symmetry decide if you want equal panels from rake edge to rake edge. For instance, if you will have 12" remainder after all full coverage decide if you want 2 – 6" panels on each side.
7. In order to simplify installation and keep panels aligned, it is recommended that the installer measure a distance equal to 4 times the panel width away from the starting edge and mark this point by striking a chalk line from ridge to eave. This mark can be used as a guide during installation and subsequent lines can be used to limit any panel drift.
8. After notching 1" for ridge base and notching and hemming the bottom for eave slide panel into position. A rubber mallet with small 2x4 can be used to gently tap into place from the bottom. Take care to ensure first panel is aligned to prevent panel drift on all following panels.
9. Follow detail drawings for attaching panels to trim accessories.
10. Once in position fasten in place with #10 x 1" pancake head wood grip screws. Take care fasteners are flush but not overdriven. Screw spacing should be 10" O.C. or every other hole for FF100.
11. Position next panel before snapping down. Tab should be tucked under ridge base. Snap from top to bottom with hand or lightly tap with rubber mallet.
12. KMP does not have standard flashings for skylights, vents, pipes, chimneys or other protrusions. KMP will custom bend any flashing for unique situations. Please reference MCA roofing installation manual as a guide for these situations.
13. Use KMP color match touch up paint to cover any small scratches. This protects to integrity of steel. Any large scratches should be removed and replaced with new panel.

RIDGE VENT DRAWING



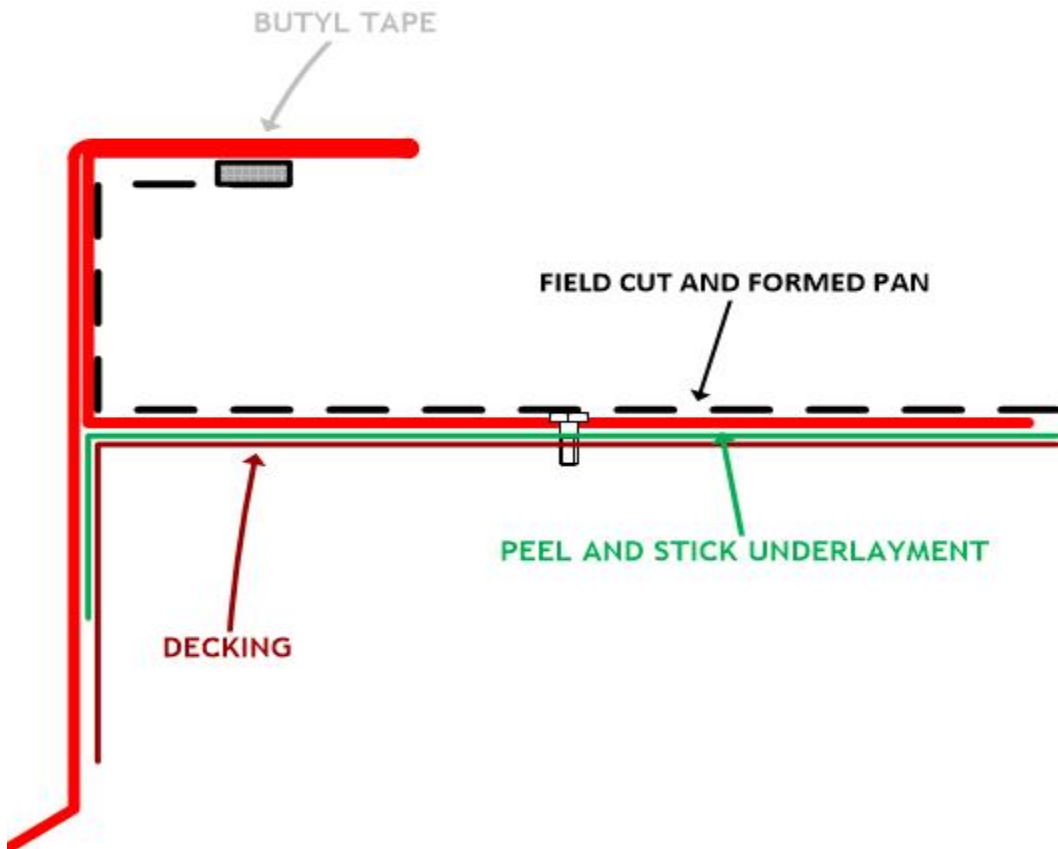
- Ridge vent is 3 piece system. 2 bases and one cap
- Install base first. Make sure they are parallel to each other and square off the rake. Important every thing is square before installing panels. Screw both bases to deck. Next base should overlap by 2"
- Install cap over bases. Fasten with rivet or screw. Use KMP paint to hide fasteners. Overlap ridge cap by 2"
- Notch panel ribs, slide $\frac{3}{4}$ " to 1" into base slot. Adjust panel for squareness.
- After panel is secured from ridge to eave, caulk ridge at intersection of panel and base including bottom and side of ribs.

DRIP EDGE DRAWING



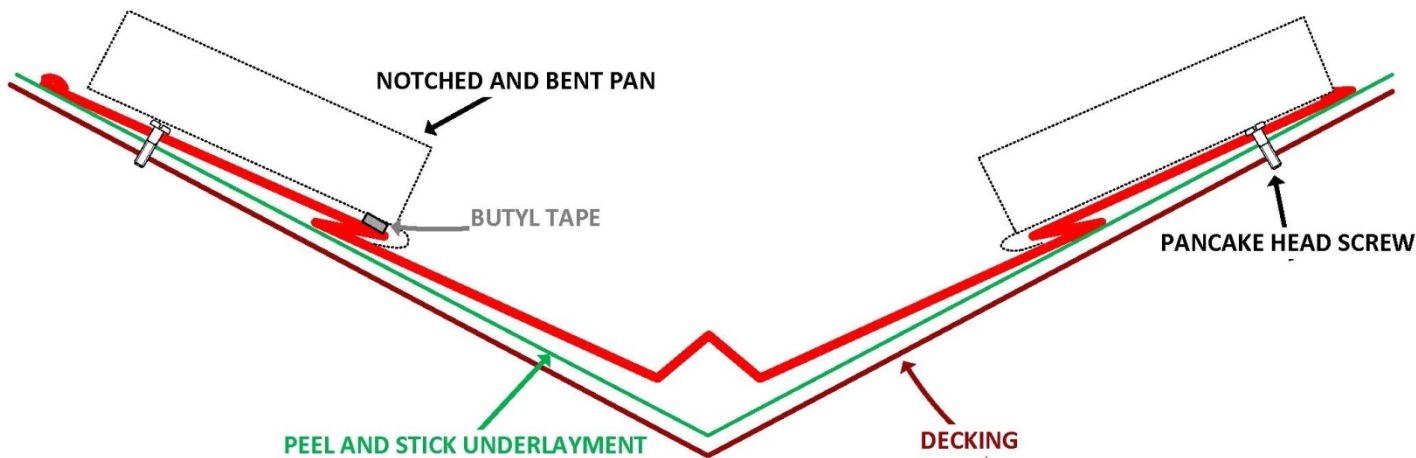
- Install drip edge first over synthetic underlayment or ice and water shield. Check local codes. Use pancake head screw on nailing hem. Make sure you are parallel with Ridge.
- Overlap next drip edge by 2"
- Notch and bend panel one inch at bottom, leaving room at drip edge for contraction. Put in place making sure squareness before fastening panel to deck.

RAKE EDGE DRAWING



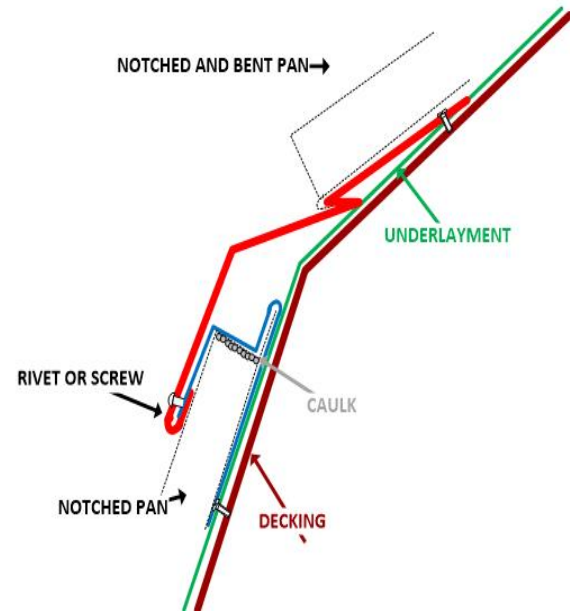
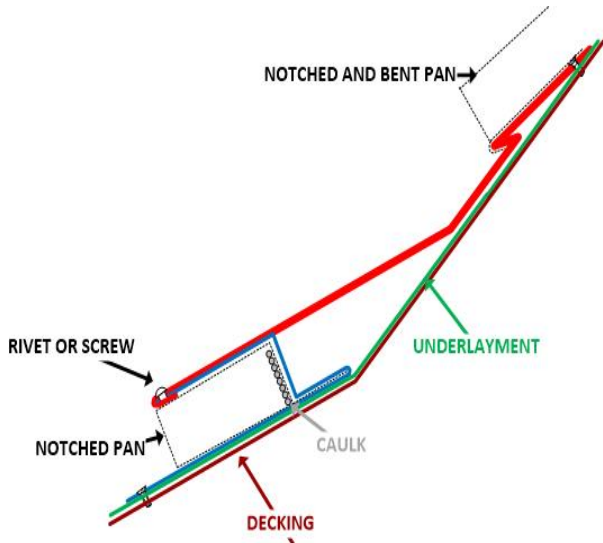
- Install Rake edge first over synthetic underlayment or Ice and water shield. Check local codes. Make sure Rake is square off ridge and eave. Fasten to deck with pancake head screw.
- If more than 10' overlap top over bottom rake edge by 6" and caulk under lap
- On starting side of house, rip female rib from panel after snapping straight chalk line. Form a J-Channel with 2- 90 degree bends just under 1".
- Place panel into receiving channel of rake edge. This panel will not be fastened to rake edge and can move independently for expansion and contraction.
- Use butyl tape for a water seal between panel and rake edge.

W VALLEY DRAWING



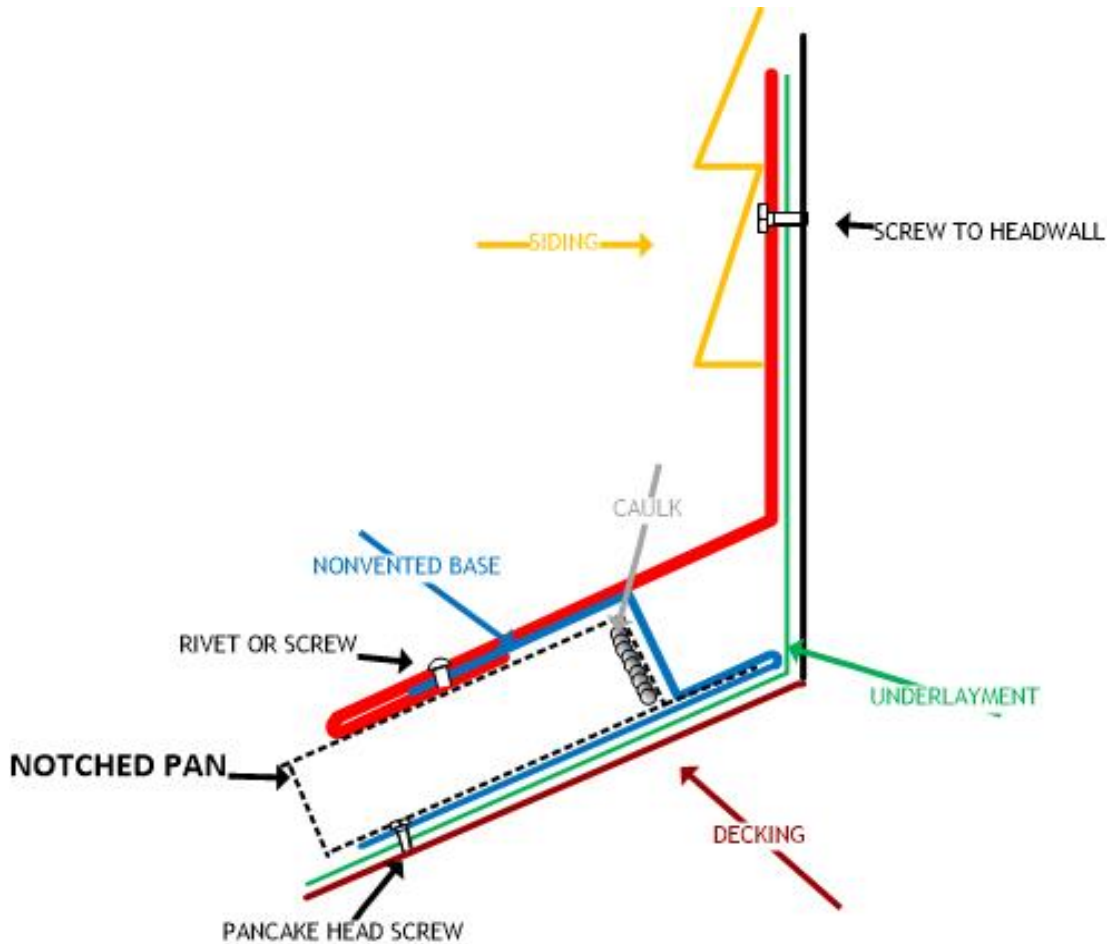
- Install W valley first over synthetic underlayment or ice and water shield. Check local codes. Make sure peak of valley is straight with valley of decking. Screw down both sides with pancake head screws
- If valleys are more than 10' overlap top W valley piece over bottom by at least 6 " with caulk under lap.
- For aesthetics panels should be notched and bent at precisely the same angle as the built –in cleat of valley. It is highly recommended to use a scrap test piece first. Use of KMP “snaptable” will give you precise, consistent miters and bends.
- Run a strip of butyl tape along the edge of built-in cleat on both sides.
- Make sure panel ribs are aligned on both sides of valley. Take your time installing as this is a major visual area.

PITCH BREAK DRAWING



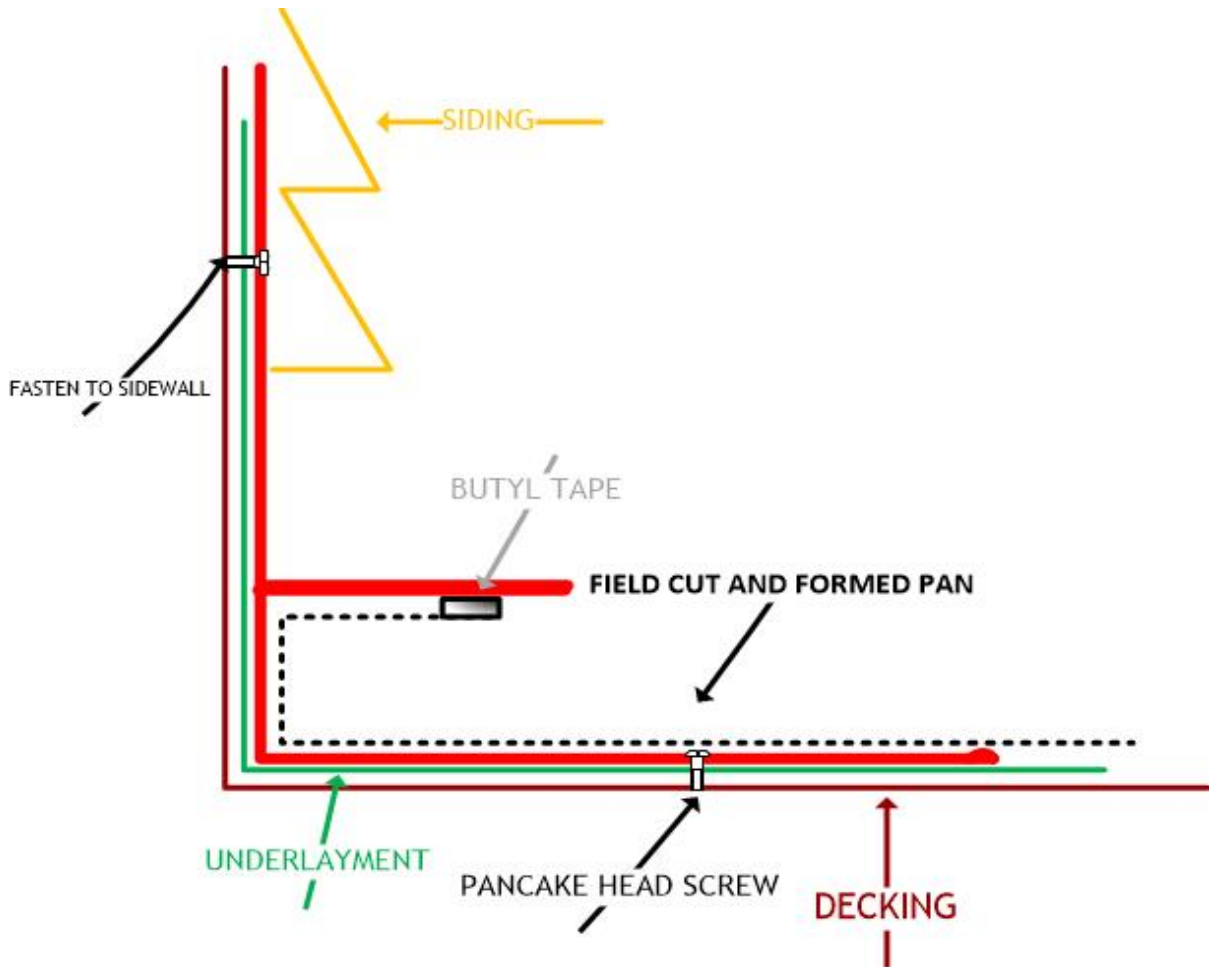
- The Pitch Break assembly is a 2 piece system. The pitch break and one non-vented base.
- Follow all Codes for underlayment at pitch break
- There are 2 different profiles. Steep to shallow pitch and shallow to steep pitch(Gambrel style)
- Rivet or screw base to Pitch Break then set in place to find corresponding angle of decking before screwing into place. Overlap with continuing piece by at least 2".
- Notch and bend panel at the top as you would Drip Edge.
- Notch $\frac{3}{4}$ " to 1" and slide into base as you would Ridge Cap.
- Caulk at intersection of base and pan and along the sides of ribs

HEADWALL DRAWING



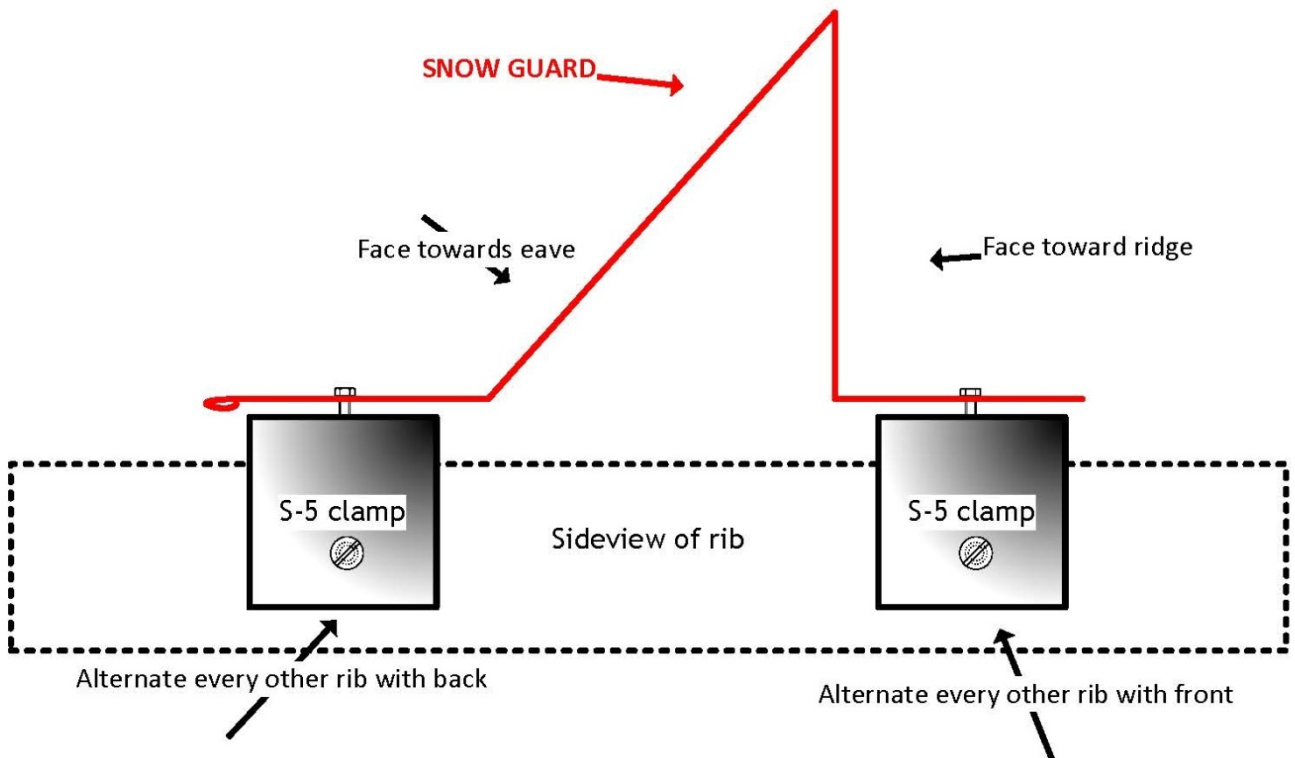
- Headwall assembly is a 2-piece system. The headwall piece and non-vented base.
- Check local codes on underlayment.
- Place base in desired location and screw headwall piece to base before fastening to wall and deck.
- Slide headwall under siding(if present) and fasten to wall.
- Notch panel at $\frac{3}{4}$ " to 1" and slide into base.
- Caulk at intersection of base and pan and along sides of ribs

SIDEWALL DRAWING



- Check local codes on underlayment
- Fasten sidewall piece to decking and sidewall board. Slide underneath siding (if present)
- Rip panel lengthwise, adding 1" for vertical leg and 1" for top horizontal leg. Bend at 2- 90 degree angles to make a J channel.
- Place panel into receiving channel of sidewall piece. This panel will not be fastened to sidewall and can move independently for expansion and contraction.
- Use butyl tape for water seal between panel and sidewall piece

SNOW GUARD DRAWING



- The use of snow guard allows snow and ice to melt slowly without the sudden release of large amounts of snow which can damage property and injure people. Snow guard is highly recommended over entry ways and garage areas.
- S-5 clamps are a strong non-penetrating fixture that can be used for all roof mountings ie, solar panels, satellite dish, etc. These clamps can be purchased through KMP. They provide over 500lb of load (visit s-5! Website for load table)
- Snap 2 chalk lines. Place S-5 clamps every other rib alternating top and bottom. Use screw gun to S-5 tension setscrew to 130-150 inch pounds
- S-5 clamps are provided with 1-16mm hex bolt at top to fix snow guard to clamp. Pre drilling of holes at bolt site is needed.