IMPORTANT NOTICE

This manual contains suggestions and guidelines on how to install Best Buy Metals panels and trim details. The contents of this manual include the guidelines that were in effect at the time this publication was originally printed. In an effort to keep pace with the ever-changing code environment, Best Buy Metals retains the right to change specifications and/or designs at any time without incurring any obligations. To insure you have the latest information available, please inquire or visit our web site. Application and design details are for illustrative purposes only and may not be appropriate for all environmental conditions and/or building designs. Projects should be engineered and installed to conform to applicable building codes, regulations, and accepted industry practices.
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Introduction

The Tuff-Rib® panel is an industry leader in strength and durability. This popular and versatile panel features classic looks and is used in a wide range of applications including residential, commercial, and post-frame buildings. Tuff-Rib® was designed with strong trapezoidal ribs to increase strength and ease handling and installation. In addition, the anti-siphoning channel on the under-lap provides extra leak resistance in the presence of extreme wind and rain loads.

Tuff-Rib® is available in many different paint colors and in both 26 and 29 gauge steel. It is also available in unpainted Galvalume® or in some cases unpainted galvanized. Our paint system and Galvalume® substrate are individually covered by a limited warranty. Please see our color chart for details on our paint system.

The Tuff-Rib® panel is available in 36” coverage. The panel has five major support ribs at ¾” high that add rigidity and strength to the panel.

Tuff-Rib® is Metal Construction Association certified. Below is a list of all of the Tuff-Rib® panels approvals and certifications.

- Dade County NOA #07-0713.03 & ASCE 7-98 Compliant
- Florida Building Code Approval #FL4586.3, #FL6144.3, #FL9610.3
- Texas Department of Insurance Approval #116
- UL 790 Fire Resistance Class A
- UL 2218 Impact Resistance Class 4
- UL 580 Uplift UL Class 90 CONSTRUCTION #584

Allowable Uniform Loads Per Square Foot

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<thead>
<tr>
<th>SPAN (INCHES)</th>
<th>18”</th>
<th>24”</th>
<th>30”</th>
<th>36”</th>
<th>48”</th>
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<td>221</td>
<td>182</td>
<td>148</td>
<td>114</td>
<td>78</td>
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</tbody>
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NOTES:
1. Theoretical allowable loads are based on section properties and allowables calculated in accordance with 2001 AISI Specifications.
2. Theoretical allowable loads are based on three or more uniform spans.
3. For roof panels, deduct self weight for actual ‘live load’ capacity of the panel.
4. These loads are for panel strength. Frames, purlins, decks and fasteners must be designed to resist all loads imposed on the panel.
5. Check local building codes if panel testing is required.
Panel Installation Guide

Storage
If metal is not to be used immediately, store inside in a well ventilated, dry location. Condensation or other moisture can form between the sheets during storage causing water stains or white rust which detract from the appearance of the product and may affect the product’s useful life. Trapped moisture between sheets of painted metal can cause white rust to form underneath the paint. This can cause the paint to flake off the panel immediately or several years later. To prevent white rust and staining, break the shipping bands on the material. Store the material on end or on an incline of at least 8” with a supporting board underneath to prevent sagging. Fan the sheets slightly at the bottom to allow for air circulation. Keep the sheets off of the ground with an insulator such as wood. Any outdoor storage is at the customer’s own risk. If outdoor storage cannot be avoided, protect the metal using a canvas cover or waterproof paper. Never cover the metal with plastic as this will cause condensation to form.

Some Safety Precautions
Always wear protective gloves when working with steel panels to avoid cuts from sharp edges. When cutting or drilling steel panels, always wear safety glasses and sweep off any metal shavings immediately to prevent eye injury from flying metal fragments. If you must walk on a metal roof, take great care. Metal panels can become slippery, so always wear shoes with non-slip soles. Avoid working on metal roofs during wet conditions when the panels can become extremely slippery.

General Installation Information
Insure that the structure is square and true before beginning panel installation. If the structure is not square, the panels will not properly seal at the sidelaps. Start the first panel square to eave by using the 3, 4, 5 Triangle Method. Green or damp lumber is not recommended. Moisture released from the damp lumber may damage the metal panels. Nails installed in green or damp lumber may back out. Remove any loose metal shavings left on the roof surface immediately to prevent corrosion. After installing roof, remove any debris such as leaves or dirt to prevent moisture from getting trapped on panels.

Fastening
If you wish to predrill fastener holes, use a cover sheet to prevent hot shavings from sticking to panels. Screws - For best results, use a 1-1/2” washered wood screw in the flat of the panel as shown in the illustration below. Drive the fastener so that the washer is compressed securely against the metal. Do not over drive the fastener as this will form a dimple that can collect water and cause leakage. Do not leave any loose fasteners that have missed the purlin. Use a #14 stitch screw or caulk to fill the hole.
Roofing
Slopes of less than 2.5” on 12” are not recommended. For slopes of 2.5” on 12” or greater, end lap panels 6”. Side laps should face away from the prevailing wind. Lay the first sheet along the eave at the down-wind side of the roof, farthest away from the direction of the prevailing winds (See Figure #4). Install sheets in the sequence shown in Figure #4.

Figure #4

Figure #5 - Installation Options

Install Metal Directly to Wood Frame
- Use Maximum 2’ Purlin Spacing
- Install Metal
*NOT RECOMMENDED FOR HEATED SPACES UNLESS INSULATION AND VAPOR BARRIER PROTECTION IS USED

Install Metal on Solid Deck
- Lay Plywood Deck
- Apply Synthetic Underlayment or other Vapor Barrier Protection
- Install Metal

Install Metal Over Existing Shingles
- Apply Synthetic Underlayment or other Vapor Barrier Protection
- Install Metal

* Proper ventilation and vapor barrier protection recommended for heated spaces

Allow an overhang a minimum of 1” at the eave to provide for a drip edge. Use inside closure at eave to prevent water infiltration, insect or bird infestation at openings. To protect against uplifting winds and to provide a finished appearance, apply gable trim. Apply fasteners every 6”-10”. Optionally apply butyl tape as shown in Figure #6 along the top of lap ribs. Do not block the siphon channel with the tape. Also an option: apply a 3/4” or 7/8” lap stitch screw into the crown of the rib to secure the side lap. This is especially a good idea on roofs with a slope less than 4:12.

Figure #6 - Proper Application of Side Lap Butyl Tape

Allowable Uniform Loads Per Square Foot

<table>
<thead>
<tr>
<th>SPAN (INCHES)</th>
<th>LIVE LOAD (PSF)</th>
<th>WIND LOAD (PSF)</th>
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<tbody>
<tr>
<td></td>
<td>18” 24” 30” 36” 48” 54”</td>
<td>18” 24” 30” 36” 48” 54”</td>
</tr>
<tr>
<td>29 Gauge</td>
<td>199 112 71 49 28 22</td>
<td>211 118 76 52 29 23</td>
</tr>
<tr>
<td>26 Gauge</td>
<td>268 150 96 67 37 29</td>
<td>276 155 99 69 38 30</td>
</tr>
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NOTES:
1. Theoretical allowable loads are based on section properties and allowables calculated in accordance with 2001 AISI Specifications.
2. Theoretical allowable loads are based on three or more uniform spans.
3. For roof panels, deduct self weight for actual ‘live load’ capacity of the panel.
4. These loads are for panel strength. Frames, purlins, decks and fasteners must be designed to resist all loads imposed on the panel.
5. Check local building codes if panel testing is required.
Using two tape measures, locate point C by hooking one tape to a nail at point A and the second tape to a nail at point B. Extend the tapes until they cross and meet at 4’ on the first tape and 5’ on the second tape and place a temporary nail where 4’ and 5’ meet.

...the 4’ and 5’ measurements are the 4 and 5 sides of the 3...4...5... triangle.

Establish a line from point A to point B by temporarily marking each point with a nail. The line must be parallel to the eave and in this example 3’ long (this is the 3 side of the 3...4...5... Triangle).

Note:
For larger 3...4...5...Triangles multiple each side of the triangle by the desired increase in size. For example, if the roof panels are 25’ from eave to ridge, multiply each side by a factor of 6 for an 18’...24’...30’...Triangle. Obviously, the closer the triangle vertical leg length is to matching the panel

Hook a chalk line to point A and pull it in line with point C and mark a chalk line on the roof deck.

This will be the square reference line for the Tuff-Rib® panel installation.
Mark chalk lines parallel with the square reference line out ahead of panel installation so that panel square can be checked as the panels are installed. Suggested line spacing is one foot beyond 3 panels wide or about 10 feet.

Check for square by measuring the distance from the installed panel edge to the chalk line at both the eave and ridge. If the measurements match, then the installed panels are square; if not, adjustments must be made to bring the panels back into square.
The following is an example of a typical sequence for the installation of Tuff-Rib® panels and trims and is specific to the roof plan and conditions illustrated. The actual sequence may vary based on the specific roof plan and applicable conditions.

1. **Moisture Barrier**
   Install the Moisture Barrier per the manufacturer’s

2. **Fascia Trim (optional)**
   Install the Fascia Trim along all eaves and rakes.

3. **Eave Trim**
   Install the Eave Trim along all eaves lapping over the Fascia Trim.

4. **Valley Trim**
   Install the Valley Trim over the Eave Trim working from the eave to the valley peak.

5. **Tuff-Rib® Panels**
   Install the panels over the Eave and Valley Trims. Do not install panels where the Ridge Trim laps under the panels.

6. **Hip Trim**
   Install the Hip Trim over the panels.
Installation Sequence

7. Ridge Trim
Install the Ridge Trim over the Hip Trim intersection and valley peak.

8. Transition Trim
Install the Transition Trim over the low slope panels and moisture barrier.

9. Tuff-Rib® Panels
Complete the panel installation installing the high slop panels over the Trim Transition and the other remaining exposed locations.

10. Gable / Rake Trim
Install the Rake Trim over the panels along all rake (gable) edges.

11. High Side Peak Trim
Install the High Side Peak Trim over the panels.

12. Ridge Trim
Install the Ridge Trim over the panels.

13. Side Wall Trim
Install the Side Wall Trim over the panels.

14. Side Wall Trim (Rear View)
Install the Side Wall Trim over the panels.

15. End Wall Trim
Install the End Wall Trim over the panels.
Install the roof substrate according to local building code requirements.

Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

Install Fascia trim and butt ends.

Fasten trim with Pancake Screws 2’ apart along the length of the trim.

Fasten trim with Wood Screws spaced 2’ apart along the length of the trim.
Fasten trim with Pancake Screws spaced 2’ apart along the length of the trim.

Install the Mini Style Eave and butt ends.

Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

Install the panel and overhang the panel a minimum of 1" beyond the Mini Eave trim edge. See panel squaring method in this manual.

Place the Inside Closure over the top of the Mini Eave or underlayment.

**Moisture Barrier**
Install moisture barrier according to the manufacture’s recommended procedure and in compliance with local building code requirements.

**Trim Pancake Screw**
Fasten trim with Pancake Screws spaced 2’ apart along the length of the trim.

**Mini Style Eave**
Install the Mini Style Eave and butt ends.

**Roof Substrate**
Install the roof substrate according to local building code requirements.

**Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

**Tuff-Rib® Panel**
Install the panel and overhang the panel a minimum of 1” beyond the Mini Eave trim edge. See panel squaring method in this manual.

**Inside Closure**
Place the Inside Closure over the top of the Mini Eave or underlayment.
Eave Trim

Numbers indicate suggested trim assembly sequence.

1. **Roof Substrate**
   - Install the roof substrate according to local building code requirements.

2. **Eave Trim**
   - Install the Eave Trim and butt ends.

3. **Trim Pancake Screw**
   - Fasten trim with Pancake Screws spaced 2' apart along the length of the trim.

4. **Moisture Barrier**
   - Install moisture barrier according to the manufacture’s recommended procedure and in compliance with local building code requirements.

5. **Inside Closure**
   - Place the Inside Closure down over the eave or underlayment.

6. **Tuff-Rib® Panel**
   - Install the panel and overhang the panel a minimum of 1” beyond the Eave Trim edge. See panel squaring method in this manual.

7. **Panel Wood Screw**
   - Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.
Tape Sealant
Apply Butyl Tape along the length of the panel.

Tuff-Rib® Panel
Install the panel and overhang the panel a minimum of 1” beyond the Eave trim edge. See panel squaring method in this manual.

Panel Wood Screw
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

Moisture Barrier
Install moisture barrier according to the manufacture’s recommended procedure and in compliance with local building code requirements.

Roof Substrate
Install the roof substrate according to local building code requirements.

Rake / Gable Trim
Install the Rake trim and overlap the ends 4”. See lapping diagram in this manual.

Trim Wood Screw
Fasten trim with Wood Screws spaced 2' apart along the length of the trim.

Trim Wood Screw
Fasten trim with Wood Screws spaced 2' apart along the length of the trim.
Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

Fasten trim with Pancake Screws spaced 2’ apart along the length of the trim. See lapping diagram fastener pattern in this manual.

Install the roof substrate according to local building code requirements.

Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

Place Expanding Closure parallel to each side of the Valley center water diverter. Closure should be up from the panel end about 1”. See panel minimum set back above.

Notes:
1. See Valley Lapping - Page 25
2. See Valley Cutting - Page 26
**Outside Closure**

Place the Outside Closure over panels.

**Panel Wood Screw**

Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

**Tuff-Rib® Panel**

Install the panel and overhang the panel a minimum of 1” beyond the eave edge. See panel squaring method in this manual.

**Inside Closure**

Place the Inside Closure over the top of the Transition. The closure should be about 1” up from the panel end.

**Transition Trim**

Place the Transition Flashing Trim over the Outside Closure.

**Trim Wood Screw**

Fasten trim with Wood Screws spaced 18” apart along the length of the trim, through the rib. See lapping diagram.

**Moisture Barrier**

Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

**Roof Substrate**

Install the roof substrate according to local building code requirements.
**Tuff-Rib® Panel**
Install the panel up 1” the transition bend. See panel squaring method in this manual.

**Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

**Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

**Trim Wood Screw**
Fasten trim with Wood Screws spaced 18” apart along the length of the trim, through the rib.

**Tuff-Rib® Panel**
Install the panel and overhang the panel a minimum of 1” beyond the eave edge.

**Moisture Barrier**
Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

**Gambrel**
Numbers indicate suggested trim assembly sequence.

1. **Inside Closure**
Place the Inside Closure over the top of the Gambrel up about 1” from the panel end.

2. **Outside Closure**
Place the Outside Closure over the top of the panels.

3. **Tuff-Rib® Panel**
Install the panel and overhang the panel a minimum of 1” beyond the eave edge.

4. **Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

5. **Gambrel Trim**
Place the Gambrel Flashing Trim over the Outside Closure.

6. **Outside Closure**
Place the Outside Closure over the top of the panels.

7. **Inside Closure**
Place the Inside Closure over the top of the Gambrel up about 1” from the panel end.

8. **Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

9. **Trim Wood Screw**
Fasten trim with Wood Screws spaced 18” apart along the length of the trim, through the rib.

10. **Inside Closure**
Place the Inside Closure over the top of the Gambrel up about 1” from the panel end.

11. **Outside Closure**
Place the Outside Closure over the top of the panels.

12. **Tuff-Rib® Panel**
Install the panel and overhang the panel a minimum of 1” beyond the eave edge.

13. **Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

14. **Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.
Panel Wood Screw
Fasten trim with Wood Screws spaced 18” apart along the length of the trim, through the rib. See lapping diagram fastener pattern in this manual.

Hip Trim
Place the Hip Trim over the Expanding Closure

Expanding Closure
Place Expanding closure parallel to each side of the hip center line so that hip fastener penetrates the center of the closure. Closure should be up from the panel end about 1”.

Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

Tuff-Rib® Panel
Install the panel and overhang the panel a minimum of 1” beyond the eave edge. See panel squaring method in this manual.

Moisture Barrier
Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

Roof Substrate
Install the roof substrate according to local building code requirements.
Ridge Trim
Place the Ridge Trim over the Outside Closure.

Outside Closure
Place the Outside Closure over the top of the panel.

Trim Wood Screw
Fasten trim with Wood Screws spaced 18” apart along the length of the trim, through the rib. See lapping diagram.

Panel Wood Screw
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

Tuff-Rib® Panel
Install the panel and overhang the panel a minimum of 1” beyond the eave edge. See panel squaring method in this manual.

Moisture Barrier
Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

Roof Substrate
Install the roof substrate according to local building code requirements.
Vented Ridge

*Numbers indicate suggested trim assembly sequence.*

**Trim Wood Screw**
Fasten trim with Wood Screws spaced 18” apart along the length of the trim, through the rib. See lapping diagram fastener pattern in this manual.

**Ridge Trim**
Place the Ridge Trim over the Profile Vent.

**Vent Material**
Apply the Profile Vent ridge venting material over the panels on each side.

**Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

**Tuff-Rib® Panel**
Install the panel and overhang the panel a minimum of 1” beyond the eave edge. See panel squaring method in this manual.

**Moisture Barrier**
Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

**Roof Substrate**
Install the roof substrate according to local building code requirements.
High Side Peak

Numbers indicate suggested trim assembly sequence.

Trim Wood Screw
Fasten trim with Wood Screws spaced 2’ apart along the length of the trim. See lapping diagram.

High Side Peak Trim
Place the High Side Peak Trim over the Outside Closure.

Trim Wood Screw
Fasten trim with Wood Screws spaced 18” apart along the length of the trim, through the rib. See lapping diagram.

Outside Closure
Place the Outside Closure over the panels.

Panel Wood Screw
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

Tuff-Rib® Panel
Install the panel and overhang the panel a minimum of 1” beyond the eave edge. See panel squaring method in this manual.

Moisture Barrier
Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

Roof Substrate
Install the roof substrate according to local building code requirements.
Side Wall

*Numbers indicate suggested trim assembly sequence.*

**Counter Flashing (optional)**
Position the Counter Flashing above the Side Wall Trim as shown. Some applications may not need counter flashing.

**Side Wall Trim**
Place the Side Wall Trim over the Butyl tape and overlap the ends 4”. See lapping diagram in this manual.

**Trim Wood Screw**
Fasten trim with Wood Screws spaced 2’ apart along the length of the trim. If wall material is not wood, fasteners will be

**Tube Sealant**
Apply Tube Sealant continuously along the Counter Flashing and generously filling the space between the flashing and the wall. Round or slope the Sealant top so that water will run off.

**Tape Sealant**
Apply Butyl Tape along the length of the panel.

**Panel Wood Screw**
Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.

**Tuff-Rib® Panel**
Install the panel and overhang the panel a minimum of 1” beyond the eave edge. See panel squaring method in this manual.

**Moisture Barrier**
Install moisture barrier according to the manufacturer’s recommended procedure and in compliance with local building code requirements.

**Roof Substrate**
Install the roof substrate according to local building code requirements.
End Wall

Numbers indicate suggested trim assembly sequence.

Tube Sealant
- Apply Tube Sealant continuously along the Counter Flashing and generously filling the space between the flashing and the wall. Round or slope the Sealant top so that water will run off.

Trim Wood Screw
- Fasten trim with Wood Screws spaced 18" apart along the length of the trim. If wall material is not wood, fasteners will be...

Counter Flashing
- Position the Counter Flashing above the Side Wall Trim as shown. Some applications may not need counter flashing.

Side Wall Trim
- Place the End Wall Trim over the Butyl tape and overlap the ends 4". See lapping diagram in this manual.

Outside Closure
- Place the Outside Closure over the top of the panel.

Trim Wood Screw
- Fasten trim with Wood Screws spaced 2' apart along the length of the trim, through the rib. See lapping diagram.

Tuff-Rib® Panel
- Install the panel and overhang the panel a minimum of 1" beyond the eave edge. See panel squaring method in this manual.

Moisture Barrier
- Install moisture barrier according to the manufacturer’s recommended procedure.

Roof Substrate
- Install the roof substrate according to local building code requirements.

Panel Wood Screw
- Fasten panels to the roof substrate using Wood Screws spaced according to the recommended fastening pattern and frequency, and in compliance with local building codes.
Trims
(Exact trims vary by plant, please call for exact dimensions)

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<td><img src="image6" alt="Transition Flashing Image" /></td>
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</tbody>
</table>
Trims
(Exact trims vary by plant, please call for exact dimensions)

Gambrel Flashing

Ridge Cap / Hip Cap

High Side Peak

Side Wall Trim

End Wall Trim
Accessories & Tools

- **Foam Closures**
  Fill In Upper And Lower Panel Ends

- **Expanding Closures**
  Expands To Fill Ends At Hips & Valleys

- **Profile Ridge Vent**
  Allows Hot Air To Vent From Ridges

- **Fasteners**
  Screws, Pop Rivets, Pancake Screws

- **Tube & Butyl Sealant**
  To Meet All Your Sealing Needs

- **Pipe Boots**
  Flashes Pipes
  Electric Boots Available

- **TurboShear HD**
  Shear Attachment for Power Drill

- **Long Nose Snips**
  Great for Cutting Panels

- **Rubber Coated Gloves**
  For Protection & Slip Resistance

- **Drivers & Drill Bits**

- **Hemming, Bending, & Turn Up Tools**

- **Pop Rivet Gun**
Valley Lapping

After cutting notches and applying Tube Sealant, slide the up slope valley into the hem groove while lapping over the top of the low slope valley 4”.

Cut 4” notch in Valley hem if applicable

Apply two rows of Tube Sealant spaced 2” apart

Cross section of completed valley Lap
Valley Cutting

Valley starter cutting diagram with water diverter tabs.

Before folding tabs

2. Bend Line, bend left tab down 90°
3. Bend Line, bend right tab down 90°

1. Cut alone dashed lines

After folding tabs
Cut pipe flashing 15% smaller than actual pipe.

Apply tube sealant to the underside of the pipe flashing.

Slide pipe flashing down over the pipe.

Press the pipe flashing into contours of panel configuration and fasten to the Tuff-Rib® panel with wood screws or stitch screws. Apply additional sealant around base if desired.